

THE BIMAS PROGRAM FOR SELF-SUFFICIENCY
IN RICE PRODUCTION*

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BIMAS is a system of agricultural extension, planned and on a mass scale, that aims to raise agricultural production, and at the same time to increase the prosperity of farmers (specifically) and of society (in general)--all in the context of building a just and prosperous society based on Pantjasila, by the will of God.

Soedarsono Hadisapoetro, 1967

In 1964, faced with the fundamental problem of population growth that was substantially more rapid than the growth of food production, and moved for reasons of nationalism to strive for self-sufficiency, Indonesia gambled on a "home-grown" solution: the BIMAS program.¹ In the short space of three years, a small-scale pilot project was transformed into a "united-front" assault on traditional patterns of rice production in virtually every rice-growing district in the nation. Although the success of the program to date has not been extraordinary, it is worth examining both as a type of approach to the basic problem of "agricultural transformation," and as an example of Indonesia's capacity to undertake programs of national development.

The immediate objective of BIMAS is the straightforward one of increasing production, of rice in this case. It has a three-pronged approach which presents to the farmer: (1) an "ideology" of modern rice farming; (2) credit to purchase a "package" of modern inputs; and (3) intensive guidance. The

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1. The acronym "BIMAS" is from bimbingan massal, mass guidance. It is reasonable to suspect that BIMAS was inspired to some extent by the agricultural programs of Mainland China, although no direct evidence of such influence is available. BIMAS also resembles, in some respects, the "package program" initiated in India under the guidance of the Ford Foundation, but again, there is no evidence that the "package program" approach was emulated by the originators of BIMAS.

first component is the ideology of *pantja usaha* (five endeavors): proper soil preparation; proper irrigation; use of improved seed varieties; use of fertilizer; and use of pesticides. The second is the BIMAS package, consisting of a sufficient amount of credit (channeled through the village-level agricultural cooperatives) to obtain the necessary seed, fertilizer and pesticides. Third is mass guidance, a concentrated effort by local agents of the Agricultural Extension Service, supplemented by university students, to spread the meaning of *pantja usaha* and to ensure delivery of the package elements "to the right place at the right time."

The *pantja usaha* has been the most effective and the cooperative-administered credit package the least effective component. For Indonesian society in the long run, however, the involvement of students may be the most significant aspect of BIMAS.

The Origin and Expansion of BIMAS²

No important efforts in the field of agricultural extension were made in Indonesia before the Revolution. The first program of note following Independence was the establishment of Rural

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2. Published material on BIMAS in the English language includes, among others: Asian Development Bank, Report of the Technical Assistance Mission to Indonesia to Advise on the Production and Availability of Foodstuffs in Indonesia, 2 Vols., (Manila, December 30, 1967) [Restricted]; Asian Development Bank, Report of the Technical Assistance Mission to Survey and Advise on the Indonesian Rural Credit System, 2 Vols. (Manila, December 13, 1968) [Restricted]; Government of Indonesia, Indonesian Science Institute (LIPI), Draft Report of the NAS-LIPI Workshop on Food, Djakarta, 27 May - 1 June 1968, 2 Vols. (Djakarta) [Mimeographed]; International Bank for Reconstruction and Development, International Development Association, Economic Development of Indonesia, 6 Vols. (February 12, 1968) [Restricted]; Leon Mears and Saleh Afiff, "A New Look at the BIMAS Program and Rice Production in Indonesia," Bulletin of Indonesian Economic Studies, No. 10 (June 1968), pp. 29-47; D. H. Penny, "Agricultural Extension for the Masses," BIES, No. 2 (September 1965), pp. 60-63; E. A. Roekasah and D. H. Penny, "BIMAS: A New Approach," BIES, No. 7 (June 1967), pp. 60-69; United Nations, Food and Agriculture Organization, Report of the FAO Survey Team to Indonesia, 23 January - 23 February 1967 (Djakarta: reprinted by Direktorat Pertanian Rakjat, 1968).

Education Centers (*Balai Pendidikan Masyarakat Desa*, or BPMD). The BPMD were to be focal points of a broad range of development activities; the original intention was to establish one in each *ketjamatan* (sub-district) in the country. But the costs of purchasing land and constructing and equipping a facility were much higher than anticipated, and, as of 1968, BPMD existed in barely twelve percent of Indonesia's *ketjamatan*.³

The next noteworthy effort was made soon after the transition to Guided Democracy/Economy. Emergency Law #16 of 1959 established a Board for Food Production and Land Development. The board can claim one accomplishment: the establishment, by 1961, of 500 Paddy Centers (*Padi Sentra*)⁴ which provided fertilizer, improved seeds, and production credit to rice farmers. Repayment was in kind at the end of each season. Unfortunately, the *Padi Sentra* failed. Credit was so easy to get that the farmers did not feel compelled to repay it; the low price set for rice in repayment of credit was a negative production incentive; and the personnel operating the centers were insufficiently trained relative to the large number of tasks they were expected to perform.⁵ The *Padi Sentra* program was officially terminated in 1964.

The year 1959 is also notable for the inauguration of the Three-Year Rice Production Plan, a massive effort to achieve self-sufficiency in rice by importing fertilizer and organizing the *petani* (peasants) to increase their production. A national command was established to oversee the program (*Komando Operasi Gerakan Makmur*, or KOGM); at the village level, executive bodies were formed to coordinate the work of the *petani* who were all (in theory) organized into ten-man teams. One innovation in this scheme was that it combined efforts to deliver the inputs necessary to expand production with efforts to "change the mentality of the farmer."⁶ The scheme failed because it was too

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3. In 1968, 371 BPMD: see: Rapat Kerdja Pangan 1968, Masalah Institutionil, Working Paper No. 5 (Djakarta, 1968), p. 8; 3164 *ketjamatan* in 1955, according to Nugroho, Indonesia: Facts and Figures (Djakarta: n.p., 1967), p. 33. In the current five-year plan, the existing BPMD will be improved.
 4. Reportedly, the Paddy Center program was based on the Philippines' success with a similar institution. United States Economic Survey Team to Indonesia, Indonesia: Perspective and Proposals for United States Economic Aid (New Haven: Yale Southeast Asia Program, 1963).
 5. Soedarsono Hadisapoetro, Bimbingan Massal Sebagai Sistem Penjualan Pertanian (Jogjakarta, 1967), p. 6.
 6. Djatianto Kretosastro, BIMAS S.S.B.M. (Djakarta, 1962), p. 7.

diffused: this was "guided extension" parallel to Sukarno's Guided Democracy; but the number of qualified leaders was insufficient to exert the leverage necessary to approach the objectives of the plan; and it proved impossible to coordinate delivery of inputs on such a massive scale.

In the early 1960's, then, great concern was directed toward increasing rice production (for political as well as economic reasons), but considerable disillusionment about the possibilities existed, considering the blatant failure of all previous efforts. Obviously, new ideas were required. The Agricultural Institute in Bogor (hereafter referred to as IPB, from *Institut Pertanian Bogor*, the name adopted in 1963 when it separated from the University of Indonesia), in keeping with its position as the best agricultural faculty in Indonesia at that time, developed the new initiatives. Nevertheless, this involvement of the college in agricultural extension in 1963 represented a departure from IPB's past traditions. In the first place, very few of its students came from rural backgrounds, and second, no more than one month of the five-year curriculum was devoted to village-level work because graduates rarely became extension officers. The bulk of Bogor's graduates went to work in the Agricultural Ministry or on the estates (plantations).

The pilot project for the BIMAS concept, located in the Karawang District east of Djakarta, was proposed by an instructor at IPB and sponsored by the Ministry of Education. How did it happen that the Ministry of Education, rather than the Ministry of Agriculture, sponsored this first attempt? Briefly, it is because a few individuals were strategically placed at the proper time, in particular, Prof. Dr. Ir. Tojib Hadiwidjaja, the present Minister of Agriculture and former Dean of the Faculty at IPB, who became Minister of Education in March 1962. The Law on Higher Education of 1961 (No. 22) had listed service to society as a third "duty of higher education," in addition to the traditional duties of teaching and research. As Education Minister, Prof. Tojib created an institute to supervise the universities in their implementation of the "third duty"--the *Lembaga Koordinasi Pengabdian Masyarakat* (LKPM), Coordinating Institute for Service to Society. At the same time, Ir. Djatianto Kretosastro, a lecturer in the Agronomy Department at IPB, had conceived of a new approach to agricultural extension based on the principle of intensive guidance. He presented it to a conference sponsored by the Agriculture Ministry in July 1963, but the response there was not encouraging. Therefore, he turned to LKPM, where his proposal was received enthusiastically.

Although there is no room here to develop a case supporting the contention, it appears that the imaginative action which produced the BIMAS program was in response to the nationalist fervor of the period. Confrontation with Malaysia had begun in

December 1962; the growing strength of the Communist Party (PKI) was alarming the traditional power structure; Sukarno was exhorting his people to greater efforts by invoking the spirit of Marhaen--the mythical peasant who symbolized the rural masses. Despite a tendency to remain aloof from the peasantry, the elite, which automatically includes all university students and graduates, felt under pressure to demonstrate positively its support of the *Pantjasila* (Five Basic Principles of the State) ideology. The BIMAS program answered this need.

Pilot Projek Pantja Usaha Lengkap,
Karawang, 1963/1964

Ir. Djatiyanto's proposed new approach to agricultural extension was tested in the field during the 1963/1964 wet season (on Java, roughly November through May). It was known as the "Complete Pantja Usaha Pilot Project" because its hypothesis stated that the most promising route to increased rice production involved assisting the petani in cultivating according to pantja usaha. To paraphrase Ir. Djatiyanto's description, it was a form of "action-research" designed to channel (in a concentrated manner) new ideas and techniques to farmers in order to increase their awareness and thus make them self-supporting. In the socio-economic field, the Project would lay the groundwork for effective *koperta* (agricultural cooperatives) and determine costs of production, costs of living, and credit needs. In the educational field, it would provide practical training for agriculture students on the one hand and introduce science to the rural areas on the other.⁷

Twelve students, in their fourth or fifth years at IPB, were selected to participate in the Project. They received special training before arriving at their sites, in mid-September 1963, and they remained in the Project's three villages until the harvest. Altogether, the Pilot Project encompassed 162 cultivators (thirteen per student) and 103 hectares (eight per student). In each village, the yields of the participants exceeded six tons of dry stalk padi per hectare. Compared with the yields of non-participants, the Pilot Project results ranged from 40% to 145% higher, depending on the village.

In the principal account of the Karawang Project, Ir. Djatiyanto stated that the doubling or tripling of yields achieved by the Project "proved" that the approach adopted was correct.⁸ Due to methodological shortcomings, however, the subsequent written records do not support the claim. How, then, did the

7. Djatiyanto, BIMAS, pp. 56-70.

8. Ibid., p. 12.

Karawang Project become the springboard for a nation-wide program? The best guess is that Ir. Djatianto was the right salesman with the right product in the right place at the right time. He was imaginative enough to draw on his experience with the Project to formulate a logical expansion of the technique which could be applied on a nation-wide basis, and he knew where to take his idea.

Demonstrasi Massal, 1964/1965

The transformation of Ir. Djatianto's concept from a pilot project to a nation-wide program took place within a matter of months. The crucial point of transition came in September 1964 during the annual working meeting of the provincial heads of the Agricultural Extension Service in Djakarta. Before discussing the proceedings of this meeting, one needs to explain the distinction between the national and the provincial extension services, and to describe how they are related to the Agriculture Ministry.

Consistent with the administrative structure of the Indonesian Government, each province has an autonomous agricultural extension service known as *Diperta* (*Dinas Pertanian Rakjat*, Office of People's Agriculture, as distinct from Estate Agriculture). Each *Diperta* provincial head is appointed by the province's governor and is fully responsible for the implementation of agricultural extension within his province. The national extension service is responsible for drawing up and funding national programs and for providing the provincial services with the technical information and material necessary to fulfill their responsibilities. The national extension service was known as *Djaperta* (*Djawatan Pertanian Rakjat*, Service for People's Agriculture) until 1965. Subsequently, it was brought directly into the Ministry of Agriculture as the *Direktorat Pertanian Rakjat* (*Dirtara*, Directorate of People's Agriculture) under the Agriculture Department.

Troubled by the earlier failures to achieve self-sufficiency in rice production, the Agriculture Ministry in 1963 was groping for a new approach. In July of that year, the Ministry sponsored a conference of graduates from the agriculture faculties in order to get some ideas for a new system of agricultural extension. This meeting declined to consider Ir. Djatianto's original proposal.

At approximately the same time each year, a working meeting is called by *Dirtara* for all the *Diperta* heads in order to review the previous year's production, check progress in the current year, and plan the coming year's programs. In the 1963 meeting, in September, the Agriculture Ministry decided that any new rice production campaign must be concentrated in areas with the best

potential for production increases and also must be administered through the koperta. In December 1963, Djaperta invited representatives of the agriculture faculties and representatives of the peasant mass organizations to a seminar called to draw up a new agricultural extension system. Their conclusions became official policy. Two of them are translated below to illustrate the spirit of the endeavor.⁹

a. The peasant class, which at this time faces difficulties in the socio-economic field and delays in the education field, consequently needs special attention in order to create a favorable climate that will stimulate the passion for work in raising the production of important crops.

b. The seminar emphasizes the need for a basic change in agricultural extension (in its objectives as well as its method and organization) so that agricultural extension will in fact fulfill its role as a tool of the Revolution.

Finally, by the annual working meeting of the extension services in September 1964, the preceding fourteen months of debate had produced a new national program to increase rice production. The details resulted from a special committee set up to formulate a program to involve students in agricultural extension. Representatives of all the agencies concerned with agricultural development participated in the discussions, including the social service institute LKPM of the Department of Higher Education, the eight agricultural faculties, the Farmers' and Fishermen's Cooperative Bank (*Bank Koperasi Tani dan Nelayan*--BKTN, now known as BNI Unit II), the National Federation of Agricultural Cooperatives (*INDUK KOPERTA*), and the State Fertilizer Trust (*P.N. Pertani*). The special committee discussions focused on a working paper submitted by the leader of the Karawang Pilot Project, Ir. Djatianto. Rather than being a simple review of the Karawang Project, however, this working paper set forth detailed guidelines for the implementation on a large scale of a new kind of extension approach. In fact, Djatianto's presentation was so well prepared that his plan was accepted virtually *in toto*. One minor departure was an acreage target of 11,000 rather than 10,000 hectares. Significantly, however, it was decided to locate *DEMAS* (*Demonstrasi Massal*, Mass Demonstration) units in fifteen of Indonesia's provinces, rather than restricting them to Java's three provinces as suggested by Djatianto. It was also agreed at the working meeting that the administrative costs of DEMAS would be shared by the Department of Higher Education and DIRTARA. BKTN agreed to provide cash credit to the participating petani through the koperta, and P.N. Pertani along with the Diperta undertook to sell inputs to the petani through the koperta.

9. Ibid., p. 11.

Because of the crucial nature of this working paper, it is worth reviewing here briefly.¹⁰ Djatianto entitled his paper "A Plan for Mass Demonstration for Self-Sufficiency in Food-stuffs" (*Rentjana Demonstrasi Massal, SSBM*). He began with the assertion that extension conducted in an intensive manner, as tested in the Karawang Project, could potentially double or triple rice yields. Experience indicated that the largest effective unit of intensification was 50 hectares with two students guiding about 100 farmers. Because the number of final-year agriculture students in Indonesia's eight agricultural faculties was only 400, this limited the number of intensification units to 200, covering 10,000 hectares.

Ir. Djatianto outlined three sets of prerequisites for the success of DEMAS; they governed the choice of areas in which to carry out DEMAS, the conditions which students and other DEMAS workers must fulfill, and the equipment and materials. Concerning the choice of areas, Ir. Djatianto distinguished between the technical/physical prerequisites including high-yield-potential factors (fully-technical irrigation, infrastructure, locally-proven seed varieties and cultivation methods) plus risk-reduction factors (flood-free and disease-free plots) and the social prerequisites, including cultivator-owned land and freedom from the negative influence of cities. The prerequisites for the students and other workers were (to paraphrase the working paper):

a. A strong mentality: willingness to sacrifice, desire to help society, consciousness of the meaning of the Message of the People's Suffering and of the third goal of the Indonesian Revolution (a just and prosperous society), proper conduct (i.e., total integration of thought, feeling and action) with the petani participating.

b. Technical knowledge: practical, not just theoretical, knowledge of soil cultivation and all stages of rice production; also general knowledge about agriculture and village sociology.

c. Strong and healthy physique: capable of assisting the petani in all his tasks for up to fourteen hours per day.

In the last part of his working paper, Ir. Djatianto drew up a detailed schedule for implementing DEMAS:

10. Ibid., pp. 123-145 for complete text.

A. Preparation for DEMAS

1. DEMAS Command Structure

DEMAS is a cooperative program including all the institutions involved in agriculture. On the highest level, the program is directed by a committee composed of the directors of all the institutions concerned. The program is carried out by an Executive Committee headed by the Director of DIRTARA, and includes representatives of all institutions concerned. At the provincial level, DEMAS is administered by the Deans of the Agricultural Faculties in the province and the head of the respective Diperta along with representatives of BKTN (for credit) and P. N. PERTANI (for fertilizer). At the kabupaten level, similar groups are formed, and at the unit level, the program is run by the local extension agent, the students assigned to the unit and various local leaders.

2. Local Extension Organization

Everyone concerned at the local level must participate in decision-making. The koperta, however, is the focal point of all efforts.

3. Coaching

Practice is as important as theory for all DEMAS workers (students, extension agents, etc.). One month of coaching will be given for all workers before starting the program.

4. Preparation of Material and Equipment

Equipment for workers (uniforms, notebooks, guide manuals), materials for cultivation (seeds, fertilizer, pesticides, tools), and extension materials (bicycles, films, pamphlets) must be available on site before they are needed.

B. Implementation of DEMAS

Workers must arrive at the unit one month before seeding. On site, workers must acquaint themselves with the locality and draw up a master plan for the season. Indoctrination of farmers must be scheduled. The workers must learn to adjust their behavior to local expectations. An inventory of material needs must be completed. The activities of the koperta must be monitored. Each worker must personally prepare a one-half to one hectare demonstration plot. All effective methods of extension must be utilized.

C. Evaluation of DEMAS

At the end of the season, a thorough evaluation of the program must be undertaken.

Considering that the working meeting at which the DEMAS program was adopted adjourned in the middle of September when planting for the wet season rice crop was beginning in many areas, the speed with which the program was implemented is remarkable. The number of units actually set up matched the target. Even more significant, the yield increases in DEMAS exceeded the yield increases attained in the Karawang Project: the average yield for DEMAS plots was seven tons of dry stalk padi per hectare compared with three tons for non-DEMAS control plots.

At least in Central Java, the success of the program was due in large measure to the nationalist fervor of the students who participated in it. At the beginning of September 1964, the students at Universitas Gadjah Mada organized a conference to summarize the previous year's efforts and to prepare the next group of students for the second year of the program. To illustrate the spirit of the period, a few excerpts from the proceedings of the conference are offered here. The conference actually was sponsored by the Agriculture Faculty (Gadjah Mada) Company of the Jogjakarta Students' Regiment, and it had three themes:¹¹

1. To integrate the Jogjakarta Students' Regiment with the society to carry out Amanat Takari by raising food production through BIMAS S.S.B.M.

2. To implement the Five Foundations of the Revolution, with BIMAS S.S.B.M. in order to carry out the Message of the People's Suffering.

3. To be successful in standing on our own two feet in the field of food production--thereby ensuring the victory of NEFOS [New Emerging Forces] over OLDEFOS [Old Established Forces].

The students designated their effort "Operation Service" (*Operasi Bhakti*) with the stated intentions:¹²

. . . to transform the productive and progressive manpower of the peasant class into a pillar of the revolution by breaking down the archaic methods of agri-

11. Universitas Gadjah Mada, Fakultas Pertanian, Musjawarah Operasi Bhakti I: Mahasiswa Tugas BIMAS S.S.B.M. tgl. 2 s/d 3 September 1965 (Jogjakarta, 1965), p. 13.

12. Ibid., p. 4.

culture that are traditional (instinctive) into ways of farming that are rational.

This task of service is not a pretext for putting ourselves among the petani; we must be capable of giving them a realization and a consciousness in consonance with the passion of the revolution.

For six months we will leave our school benches to plunge ourselves among the petani without counting gain or loss.

In closing, the conference issued ten directives including the following:¹³

4. Students . . . will strive for the common goal of . . . transforming the individualistic/traditional petani into a cooperative petani, a *gotong-rojong* [mutual self-help] petani, and a rational petani. . . .

8. . . . With BIMAS . . . the koperta . . . will become a means of rubbing out the vestiges of capitalism and feudalism and all other forms of exploitation.

Bimbingan Massal S.S.B.M., 1965/1966

The year 1965 was a pivotal one for Indonesians. The turmoil which began in September in Djakarta spread throughout the country and ultimately led to the replacement of the Sukarno regime by a "New Order." It was also the year in which BIMAS was born.

BIMAS grew out of a series of meetings or seminars in 1965. The first meeting, held in Jogjakarta on July 3, was sponsored by Dirlara and attended by the heads of the three Diperta on Java, by the Deans of the Agricultural Faculties, and by a representative from the National Federation of Agricultural Cooperatives (INDUK KOPERTA). This meeting drafted seven instructions which formed the basic "compass" for the following year's rice self-sufficiency program. The important points included changing the name of the program from DEMAS to BIMAS and determining that the program would cover 150,000 hectares and would mobilize all available students at agricultural high schools, agriculture-related academies, university faculties, and also cadre from the cooperative movement and extension agents.

In mid-July, President Sukarno formed a National Food Council (KOTOE Instruction No. 46 of 1965), containing an Operational

13. Ibid., pp. 79-80.

Unit for Food responsible for "mending, upgrading, and coordinating" the mass intensification efforts of BIMAS. As a result responsibility for the implementation of BIMAS was transferred from DIRTARA to the highest administrative level of the Government. The purpose for the change was to guarantee that all the non-agricultural inputs (such as credit, transportation, and marketing) would be made available as required.¹⁴

In the middle of August, the major planning meeting for BIMAS 1965/1966 was held in Djakarta. The participants included the Departments of Agriculture, Higher Education, and Transmigration/Cooperatives, twenty-two Deans of the Faculties of Agriculture, Forestry, Fishing, Animal Husbandry, and of the Teacher Training Institutes, the Bank (BKTN) and the INDUK KOPERTA. By an order of President Sukarno, the conclusions of this August meeting became the official directives for implementing BIMAS, and all Government organizations were instructed to follow them.¹⁵

1. Basic Policy. BIMAS is an extension tool for rapidly and massively raising production. By 1969/70, BIMAS is to put into practice complete pantja usaha on all sawah cultivated in Indonesia. The koperta is to be given full support on all sides in carrying out BIMAS. The objective of BIMAS is complete national self-sufficiency, including fertilizers and pesticides.

2. Fundamentals of Implementation. In ketjamatan with DEMAS units, there will be ten to fifteen times as many BIMAS units in 1965/66 [than there were in the previous year]. Every other ketjamatan must have at least one unit. All inputs will be provided to units which are participating for the first time; in each subsequent year, every unit must become increasingly self-sufficient to the point where it no longer requires programmed assistance to follow full pantja usaha. The koperta must employ full-time administrators for the program.

3. Organization. As in DEMAS, executive commissions will be formed at each administrative level with representatives of all organizations involved. In addition, each executive committee will be backed up by a committee of experts. At the local level, the petani in each unit are to be divided up into teams for soil preparation, fertilizer application, irrigation, etc.

14. Note that this action amounted to a repetition of the KOGM system of organization in 1959 which was a failure.

15. Djatianto, BIMAS, pp. 152-156.

4. Sampling. For evaluation purposes, sampling of yields must be done scientifically in accordance with instructions from the Expert Committees.

5. Choosing Units. Plots must be chosen which have maximum potential for yield increases, which are visible to non-participants which are representative of soils in the ketjamatan, which belong to people who believe in the program and will follow it faithfully.

6. Improved Seeds. Fertilizer-responsive improved varieties must be used. Provision must be made for supplying such seeds to areas surrounding the units as well as to the units themselves.

7. Organic Fertilizer. Chemical fertilizers must be supplemented by organic fertilizer as much as possible; to provide incentives for their use, contests will be conducted for the best results with organic fertilizer.

8. Processing and Marketing. These are as important as increasing production if BIMAS is to bring about a higher standard of living for the petani.

9. Becoming Self-sufficient. Participants in each unit must decide how to accumulate capital from the yield increases to make the koperta self-supporting.

10. Koperta Maturity.¹⁶ The koperta must become fully mature in order to reach the stage of Indonesian socialist agriculture that is based on gotong rojong while respecting the right of individual ownership.

Less than two months after the details of BIMAS 1965/66 were settled, just as most students were preparing to leave for the villages, the "September 30th Movement" took place. In spite of the turmoil which followed, BIMAS was implemented. The acreage target, in fact, was exceeded (158,000 ha. rather than 150,000 ha.), although there were only 2,789 units instead of the planned 3,000 units. Out of the 25 provinces, eighteen had BIMAS units and close to 1500 students were mobilized (less than half the students were from agricultural faculties). The yield increases were disappointing, however: five and one-half tons per hectare in BIMAS as against three tons per hectare

16. In Indonesian jargon, the "maturity" (*pendewasaan*) of a cooperative indicates its degree of effectiveness or level of development.

outside BIMAS;¹⁷ partly perhaps, because the social turmoil during the 1965/66 wet season had resulted in late planting and improper care during the growth period. The dilution of the extension effort and bottlenecks in delivering the inputs (including credit), however, were probably more important factors.

BIMAS Programs, 1966 to 1968

Planning for the 1966/67 wet season began in April 1966, at a special BIMAS conference in Tretes, East Java.¹⁸ It was decided at the conference that BIMAS in the coming wet season would cover 1.3 million hectares (up from 150,000 hectares in the previous wet season), including 300,000 hectares in a special program near Djakarta designed to fulfill the needs of the capital (*Projek Dewi Sri Djaja*). In order to carry out a program on such a massive scale, the conference called for the participation of all university students, not just those in agriculture-related Faculties.

In fact, the BIMAS program in 1966/67 was not carried out on the fantastic scale envisioned at the Tretes meeting. The acreage target only tripled from 150,000 hectares to 480,000 hectares (in twenty provinces) and the actual coverage realized was slightly over 450,000 hectares. The number of students involved increased from 1500 to 2500, and there were sharp increases in the number of extension service and koperta workers assigned to BIMAS. In addition to the special project for Djakarta, there was a similar effort organized for the city of Medan in North Sumatra (*Projek Pangan Medan Djaja*--on 50,000 hectares). Another noteworthy innovation in the 1966/67 season was the contract awarded to the Swiss chemical consortium, CIBA, for aerial spraying 30,000 hectares of rice fields in South Sulawesi. The spraying was done on credit and repayment in kind was arranged by the provincial government.

The most significant change in BIMAS 1966/67 was the method of financing the program. The Tretes conference had proposed that financing be integrated with the operations of *KOLOGNAS*.

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17. In BIMAS 1965/66 and all subsequent years, the Department of Higher Education no longer played a direct role in the planning or the financing of BIMAS. In 1965/66 BIMAS was funded by the National Food Council, DIRTARA, and the National Bank. (BNI Units I and II).
 18. The dry season rice crop became involved in BIMAS for the first time in the 1966 dry season (April through September): more than 100,000 hectares in three provinces. Credit arrangements were changed as detailed for 1966/67 BIMAS. No students participated in this season or any subsequent dry seasons.

(*Komando Logistik Nasional*, the command responsible for purchasing and distributing rice for the civil service and the military). Certain funds in the national budget had been allocated to KOLOGNAS for the purchase of rice in 1967. Rather than using these funds directly for the purchase of rice, a part of them (30%) was transferred to BIMAS to finance the 1966/67 program with the provision that this credit be repaid in kind from the increase in production on BIMAS plots, up to an amount equal to the purchases planned by KOLOGNAS for 1967.¹⁹

The 1967 dry season BIMAS program was reduced from 100,000 ha. to 12,000 ha., but these were divided among eight provinces rather than three as in the previous dry season. In the 1967/68 wet season, BIMAS was not expanded significantly; the problems of rapid growth started to catch up with the program, especially the problems of credit repayment and extension personnel. Less than half of the credit extended the previous year had been repaid, and the non-agricultural faculties of the universities were no longer willing to send their students into the villages for six months. The actual acreage covered by BIMAS in 1967/68 was 470,000 hectares. No data is available on yields.

By the 1967/68 season, the whole program had become rather confusing. One confusion was the distinction between BIMAS financed by the provinces and national BIMAS; another was the separate administration of projects like Dewi Sri Djaja and Medan Djaja. Still another was the inauguration of quasi-BIMAS programs: *INMAS*, short for *intensifikasi massal*, in which the participants were responsible for their own financing; *BIMAS Gogo Rentjah*, covering plots planted for dry rice cultivation that are converted to wet cultivation if sufficient rain is forthcoming; *BIMAS Berdikari*, where the inputs were financed either by provincial funds or by the farmers themselves; *BIMAS CIBA*, where the inputs were provided by the Swiss pesticide manufacturer, CIBA, on credit; *BIMAS Baru* (New BIMAS), for promoting the new "miracle" rice varieties PB5 and PB8; *KOPAN*, a special development plan in Sumatra that was promoting the cultivation of high yielding rice varieties; "Free" BIMAS, a proposal put forward by the Governor of South Sulawesi to use the differential in the price of rice between Makassar and Djakarta to purchase fertilizer and other modern inputs for the program; not to mention a number of small, local programs sponsored by sugar mills, rice mills, manufacturing companies--such as P. T. Mantrust in West Java--and government or private estates.

The target for dry season BIMAS in 1968 was 424,000 hectares in eleven provinces, and estimates are that 50% of the target was achieved.

19. Djatianto, *BIMAS*, p. 174.

The BIMAS Program, 1968

From 1964/65 to 1967/68 BIMAS grew from 11,000 hectares to almost 500,000 hectares (out of six million hectares of sawah throughout Indonesia). This rapid expansion was the result of pressures from different directions. First the Government was anxious to eliminate the need to import rice. Second, for implementing BIMAS, the Diperta received special funds from the center in proportion to the size of the BIMAS program in their respective provinces. Third, individual farmers and groups of farmers exerted pressure to expand BIMAS because they wanted to cash in on what they considered to be a windfall. The expansion of BIMAS was limited by the number of students available for guidance and the funds necessary to finance and administer the program. Demand for BIMAS programs far exceeded supply, which explains the appearance of the BIMAS-type programs mentioned earlier.

In this section, the highlights of BIMAS as it appeared in mid-1968 are reviewed.²⁰ First, the BIMAS package is examined, along with two recent elaborations on the basic package, i.e., BIMAS Baru and BIMAS CIBA. Then in successive sub-sections, comments are made on the relationships between BIMAS and the koperta, the students, and the petani.

The BIMAS Package and Two Recent Elaborations

For each of the elements of the BIMAS package, there have been difficulties of delivery "in the right place at the right time." However, the most serious difficulties have arisen with the administration of credit.²¹ A thorough study of BIMAS credit alone would have required more time than was available for this entire study. Nevertheless, several features of the credit system stood out clearly enough to be commented on here. In the first place, petani frequently stated that not enough credit was available, i.e., they wanted to use more fertilizer than they could buy with the credit provided. In the second place, more than one-half of all credit extended to petani in

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20. Generalizations about the program, unless otherwise indicated, apply most directly to the province of Central Java where the bulk of field research for this study was carried out with the cooperation of Fakultas Pertanian, Universitas Gadjah Mada, Jogjakarta.
 21. The responsibility for credit has been assigned to Unit II of the National Bank (Bank Negara Indonesia, or BNI Unit II).

Indonesia is provided by the private sector.²² In the third place, since dry season BIMAS 1966, only half of the credit available for BIMAS has been taken by BIMAS participants.

How are these apparent inconsistencies explained? Partly because, as a national policy, the BIMAS package is "selective," a petani can therefore opt for less than the full package. In practice, when the petani does not select the full package, he only takes credit for fertilizer (or part of the fertilizer), leaving unused the credit for transportation, soil preparation, cost of living, or, most disturbingly, pesticides. Another part of the explanation is that when the BIMAS credit is not available at the right time (or administrative complications have arisen), the petani is forced to turn to private sources. Also, BIMAS credit is only available for rice production and presumably a large portion of the private credit is supplied for other crops. In addition, the BIMAS package is the same throughout the nation although local needs vary greatly from area to area. In other words, the package fulfills the needs for average soil conditions, but the majority of farmers cultivate land with input requirements that either exceed or fall short of the mean.

Another noteworthy feature of the credit system is the practice of using land as security for credit. A question that needs further study is the extent to which the land guarantee prevents cultivators who do not own sawah from obtaining BIMAS credit (conceivably, in virtually all cases, the home of the cultivator is sufficient to guarantee the loan).

The most significant difficulty with BIMAS credit has been repayment. Ever since the beginning of BIMAS, there have been serious repayment problems, perhaps because the Government has never seized the land of any petani who defaulted on his payments. In 1966/67 BIMAS, the rate of non-repayment was exceptionally high. In Projek Pangan Medan Djaja, for example, out of Rp. 40 million credit supplied, only Rp. 10 million was repaid on time.²³ The accepted explanation for the problem in 1966/67 is that repayment in kind was a mistake. It was in this year that credit for BIMAS came from KOLOGNAS, with the provision that it be repaid in kind. As a result of this 1966/67 experience, Dirlara now supports repayment in cash as a matter of principle. One problem with repayment in cash is that the rate of inflation is usually higher than the rate of interest charged, so that less than the real value of the credit is repaid. Consequently, repayment in cash introduces an element of subsidy into the BIMAS program, an aspect which deserves further study.

22. Government of Indonesia, LIPI, Draft Report, p. 36.

23. K. Sebahang, Projek Pangan Medan Djaja 1966/67 (Medan, 1968), p. 35.

The two major components of the BIMAS package, fertilizer and pesticides, have been handled with different degrees of success. The determination of the recommended fertilizer dose is a process too involved to describe here, but the outcome is that the dosage recommended, on a nation-wide basis, is too large for the more traditional farmers and too small for the more progressive ones. The distribution of fertilizer has been the responsibility of the state-owned P.N. Pertani. In the early years of BIMAS, complaints about faulty delivery of fertilizer were commonplace. However, in the areas of Java where this research was conducted in 1968, complaints about P.N. Pertani's performance were rare, and the enterprise appeared to be moving forward vigorously with a program of building local depots.

As far as pesticides are concerned, critics of the BIMAS program agree that it has failed to spread the use of pesticides to an extent commensurate with their need or potential benefit. The most widely used pesticide has been a liquid spray, enderin. A severe problem encountered in the use of all sprays has been the distribution and maintenance of sprayers. Many different kinds of sprayers have been tried, none of which have proven to be entirely satisfactory. Even aerial spraying has been tried.

In the summer of 1968, preparations were being made for two programs in the BIMAS family that are of special interest: BIMAS Baru and BIMAS CIBA. The value of the BIMAS Baru credit package is roughly 25% greater than the value of the "normal" BIMAS package (1968/69) because it includes a 50% greater dosage of fertilizer in order to maximize the yield from the new "miracle rice" varieties, PB5 and PB8, which the BIMAS Baru program is designed to promote.²⁴ The new varieties are short-stalk, fertilizer-responsive, fast-maturing varieties that have been successfully cultivated on a large scale in the Philippines, India, Thailand, and Vietnam. Preliminary trials in Indonesia indicate that the new varieties will double the yield increases which result from participation in BIMAS--the average per hectare increase in normal BIMAS is 1.6 tons of dry stalk padi; in BIMAS Baru the anticipated increase is 3.0 tons.²⁵

BIMAS Baru is a logical elaboration of the BIMAS program, although questions do arise. Will the Government be able to multiply the necessary amount of seed and distribute it on time?

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24. PB stands for Peta Baru ("new" Peta) and the designation is based on the fact that one of the genetic ancestors of the IR5 and IR8 varieties developed at the International Rice Research Institute in the Philippines is an improved Indonesian variety called Peta.
25. Pemerintah Indonesia, Rapat Kerdja Pangan 1968. Program Produksi Padi/Beras 1969 dan 1970, Working Paper No. 2 (Djakarta, 1968), p. 8.

Is the recommended fertilizer dosage in the "new" package optimum or less than optimum? How adaptable will the new varieties be in practice when cultivated widely; will the anticipated high yields materialize and will the varieties be resistant to local diseases? Will the necessities of cutting PB5 and PB8 with a sickle rather than a knife and of threshing in the field rather than in the home, as traditionally done, constitute barriers to their acceptance? Will the taste of the "miracle" varieties be acceptable to the Indonesian petani?

The second new member of the BIMAS family, BIMAS CIBA (also known as BIMAS Gotong Rojong or Company BIMAS), is something of a bastard, and faces most of the difficulties implied by that epithet. CIBA is the Swiss-based chemical consortium which carried out an aerial-spray project in South Sulawesi in 1966/67. The firm produces an insecticide called Dimecron 100 that is available in a concentrated form particularly suited for application by aircraft. On May 24, 1968, CIBA and the Government of Indonesia entered into a contract which provided that the company would apply their insecticide three times to 300,000 hectares of sawah (100,000 hectares in each of the three provinces of Java) in the 1968/69 wet season.²⁶

The Government in turn agreed to pay CIBA US \$40 per hectare, or a total of US \$12 million (subsequently raised to US \$52.50 per hectare or US \$15.75 million). In addition to the fertilizer and insecticide provided, CIBA agreed to pay the Government a Rp. 40 per hectare Management Fee to administer the program, to bear the cost of transporting the materials to the sites, to provide the Extension Service with a specified number of jeeps, motorcycles and bicycles, and to assume certain other minor costs.

To say that BIMAS CIBA is a bold undertaking is an understatement. There is some question, however, as to who is being bold: CIBA or the Government of Indonesia. In one respect, CIBA is not exposed to any risk: a group of Swiss banks have guaranteed hard-currency payment to CIBA. On the other hand, it is unlikely that CIBA is simply interested in short-term profit-making: the company has other interests in Indonesia (pharmaceuticals and dye-stuffs) that would be jeopardized if BIMAS CIBA were to fail. Still, it appears to be the Government of Indonesia that has gone out on a limb. The difficulties added together are imposing: the ordinary administrative/logistical problems encountered in Indonesia introduce a high degree of uncertainty into any undertaking; the petani who participate in BIMAS CIBA have no choice in the matter; the plots chosen must be adjacent to each other in a large block for aerial

26. The contract contains an option for carrying out the program on 400,000 hectares in the 1969/70 wet season, and anticipates the continuation of the program for a total of five years.

spraying; the plots must be planted at the same time within any given block--maximum variance is two weeks--and with the same variety of seed in order for the spraying to be effective on the entire block; the borders of the blocks must be sprayed by hand; and the petani participating must pay for the project by surrendering as much as one-fifth of their net production. BULOGNAS will be responsible for collecting the payments, i.e., CIBA has no responsibility for repayment. This last difficulty is likely to be the most serious one.²⁷

BIMAS and the Koperta

Indonesia's emphasis on cooperatives is a natural outgrowth of her ideology, as formulated principally by Sukarno. In particular, cooperatives are considered to be an institutionalization of the gotong-rojong concept that is central to the Indonesian ideology. Nevertheless, the development of cooperatives in Indonesia has proceeded at a very slow pace, as illustrated by the fact that there was no national law dealing with cooperatives until 1965 (Law No. 14). That law established three classes of cooperatives: consumer, producer and service. It also set forth ten operating principles for cooperatives including voluntary membership, equal responsibility for all members, and decision-making by a consensus resulting from mutual consultation. With regard to agricultural cooperatives specifically, Law No. 14 of 1965 restricted membership in koperta to owner-cultivators and agricultural laborers. Also, the koperta were organized in federations at each administrative level: *pusat* (core) koperta at the *kabupaten* (district) level, *gabungan* (combined) koperta at the province level, and *induk* (lit. mother) koperta at the national level. The Law also defined the activities of the koperta to include improving methods of production, research, planning, marketing, education, and information.²⁸

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27. Recent (July 1969) newspaper articles in Djakarta have described BIMAS CIBA in West Java as a complete failure. At the same time, the BIMAS CIBA project will be continued in the 1969/70 wet season, and other foreign companies are undertaking similar projects (Hoechst from West Germany--250,000 hectares; Coopa from Italy--150,000 hectares; A.H.T.--60,000 hectares; and Mitsubishi from Japan--25,000 hectares). Figures from correspondence with Agriculture Ministry official, August 1969.
 28. On December 18, 1967, Law No. 14 of 1965 was repealed and a new Law on the Basic Regulations for Cooperatives (No. 12) enacted. The important articles of the new law provide for the elimination of inactive and unqualified cooperatives.

As was described in the previous section, the koperta were given a central role in the BIMAS program at an early stage (DEMAS 1964/65). In fact, the program was set up in such a way that the petani could not participate in BIMAS unless they were members of a *primkoperta* (primary agricultural cooperative). This requirement sparked the formation of koperta on a massive scale that no prior effort had been able to achieve. Unfortunately, at present, the vast majority of koperta exist in name only, serving no function other than to qualify members for participation in BIMAS. Out of the 17,000 primkoperta that are registered, there are literally no more than a handful that are exercising any initiative.²⁹

There are conflicting interpretations of the relationship between BIMAS and the koperta. On the one hand, members of the cooperative movement frequently express their belief that BIMAS ruined the primkoperta. They argue that no cooperative can be viable unless it is created "from below." BIMAS forced the organization of koperta "from above" at such a precipitous pace that the preliminaries necessary to make the koperta viable were never completed. On the other hand, officials in charge of BIMAS tend to feel strongly that the koperta hurt BIMAS. These officials point out that the extension service, even supplemented by students, is not large enough to cover more than ten percent of Indonesia's sawah thoroughly. The goal of self-sufficiency, however, requires that BIMAS cover at least 25% (i.e., the area that is double-cropped). BIMAS can only reach its goal, then, if the koperta in fact are capable of administering the program in most areas. Since the koperta have proven themselves incapable of the task, BIMAS is unable to achieve its objective.

There is fairly universal agreement as to the reasons for the failure of the koperta. The following are cited most frequently:³⁰

1. The peasants have no faith in the primkoperta because of early irregularities and because they see no tangible benefits accruing from membership.

2. The members are not morally/mentally prepared for koperta membership, nor do they have sufficient knowledge of the objectives and methods of the koperta.

29. The figure for registered primkoperta is for 1967. Pemerintah Indonesia, Rapat Kerdja Pangan 1968, Masalah Institusional, Working Paper No. 5 (Djakarta, 1968), p. 5.

30. Universitas Brawidjaja, Fakultas Pertanian, Pengantar Pantja Usaha BIMAS S.S.B.M. 1966-1967 (Malang, 1966), chapter six; Samedi Sumintaredja, Peranan Perguruan Tinggi Dibidang Penelitian dan Pendidikan . . . (Djakarta, n.d.), p. 17; Djatianto, BIMAS, pp. 105, 117.

For this reason, they do not exert any control over the activities of the leaders.

3. The leaders are not morally/mentally prepared to lead the koperta. In part, this is due to the low prestige accorded to koperta leaders in Indonesia. Normally, the koperta staff is unpaid, or receives only a nominal salary--which encourages irregularities. An additional weakness in koperta leadership is inadequate training.

4. The higher levels in the koperta hierarchy fail to exert effective guidance and control over the primkoperta.

5. There are no manuals establishing practical guidelines for leaders and members.

6. The primkoperta lack capital and facilities. A partial explanation for this shortcoming is inflation: the high rate of inflation prevailing in Indonesia seems to discourage the accumulation of capital by cooperatives as much as by businesses and individuals in general.

7. The koperta cannot compete with the local moneylender as a source of credit. The moneylender gives credit without administrative formalities, on short notice, and for non-agricultural purposes.

In short, the koperta is known as "the bogeyman of the peasant."³¹ In spite of great expectations and arguments that the koperta is the institution most suited to the Indonesian setting for the development of agriculture, the koperta is not pulling its weight.

BIMAS and the Students

The use of students in development programs is not unique to Indonesia. However, there is no evidence to suggest that the use of students in BIMAS was inspired by the example of any other country. In fact, the origin of BIMAS as described earlier offers convincing evidence that BIMAS is *sui generis*.

In order to avoid exaggerating the role of students in BIMAS, it should be pointed out that the students are not considered by all involved to be a permanent feature of the program. Rather the students are seen as temporary elements that will be

31. Djatianto, BIMAS, p. 106.

withdrawn gradually as the koperta develop the capability of independently promoting increasingly high levels of agricultural production.³²

There is no space here to review the educational structure in Indonesia as it relates to agriculture. Suffice it to say that children begin elementary school at the age of seven or eight. Six years of elementary school are followed by three years of middle school and then three years of high school. Graduates of high school can pursue higher studies at vocational academies, teacher training institutes or universities. The first two have three-year curricula; universities have a five-year curriculum with the terminal degree considered to be the equivalent of a master's degree. Only eighteen percent of the population has completed the six years of primary school.³³

Below the university level, there are vocational schools for agriculture at both the middle school and high school levels. There are also Cooperative Academies and Agricultural Academies. No figures are available on the number of these schools, but they are certainly few and far between. It is worth noting here that the curricula for the primary schools and the general junior and senior high schools, even those located in rural areas, do not presently include agricultural subjects.

Some basic data about students in higher education is presented in Table 1. In terms of our interests here, the important features to note are: the small proportion of students in agriculture--five percent; the large proportion of students in the first year--49%; and the small number of agriculture graduates.

There are three points to be made about the agriculture faculties as they relate to BIMAS. First of all, the curriculum devotes little time to agricultural development problems and village studies. Since the majority of agriculture graduates are expected to go on to careers in the plantations, the sugar mills, the Agriculture Ministry, the research institutes, or in teaching, it is assumed that they have no specific need for training in rural development.

Second, all students are required to perform six months of *praktek umum* (general practice) outside the university before graduation. It seems logical for students to fulfill their *praktek umum* requirement by participating in BIMAS. Although this may have been the original intention, in practice most

32. Soedarsono Hadisapoetro, Bimbingan Massal, p. 11.

33. Figure for 1964/65, from W. Brand, "Manpower Situation in Indonesia," Bulletin of Indonesian Economic Studies, No. 11, p. 62.

Table 1

Statistics on Higher Education, 1967

I. Total Number of Students in State and Private Universities and Institutes		
Private schools	18,000	
State schools	<u>110,000</u>	
Total	128,000	
II. Students in State Universities and Institutes		
--Non-exact departments (law, economics, politics, psychology, sociology, public administration, public relations, literature):		52%
--Exact departments (medicine, pharmacy, biology, physics, chemistry, mathematics, engineering, agriculture, geology):		31%
Of which agriculture:		5%
--Teacher training institutes		<u>17%</u>
		100%
III. Distribution of Students by Year of Study, State Universities and Institutes		
First year	49%	
Second year	19	
Third year	16	
Fourth year	9	
Fifth year	6	
Sixth year	<u>1</u>	
	100%	
IV. Total Graduates, 1950-1967, State Universities and Institutes		
Medicine	5,038	23%
Law	4,453	21
Engineering	3,175	14
Economics	2,586	12
Education	1,437	7
Agriculture	1,355	6
Other	<u>3,788</u>	<u>17</u>
Total	21,832	100%
V. Estimated Graduates, 1967, State Universities and Institutes		
--Assuming all sixth-year students and 5/6 of the fifth-year students graduate:		6,600
--Of which agriculture graduates number (assuming the ratio of graduates in agriculture is the same as the ratio of students enrolled in agriculture)		330 (= 5%)

Source: Government of Indonesia, Department of Education and Culture, Directorate of Higher Education, Report of the Statistics Team on Higher Education in Indonesia (Djakarta, 1967).

students have found it necessary to perform praktek umum in addition to participating in BIMAS--thereby lengthening an already excessive course of study. In 1967, the Directorate of Higher Education instructed all universities to integrate praktek umum into the five-year curriculum, but in the middle of 1968, it was doubtful whether the faculties would in fact follow the spirit of the instruction.

Third, by the summer of 1968, enthusiasm about BIMAS in the agriculture faculties was obviously rather low. IPB, in fact, refused to participate in 1967/68 BIMAS for a number of reasons, among them uncertainty about who was going to pay the expenses of the students and dissatisfaction with the excessively rapid expansion of the program. At other faculties, when mandatory participation in BIMAS was lifted, most students preferred to undertake their praktek umum in places more pertinent to their aims (i.e., plantations, mills, etc.).

Students who are "BIMASed" may or may not serve in their native villages. The only instance of students being sent specifically to their own villages as a matter of policy was in 1965/66 BIMAS when political turmoil created a serious problem of security. Clearly different patterns have emerged in different provinces: in North Sumatra, the practice has been to have students work only within their *suku* (linguistic/ethnic group); in Central Java, on the other hand, students have been deliberately sent to areas far from their place of origin. Sometimes students have been able to live with relatives in the villages or towns to which they are assigned. In general, however, the students have lived in the home of the village chief--which appears to be a satisfactory arrangement. Basic expenses of the students have been paid by the BIMAS program. In Central Java, in 1967/68, students received money for transportation to and from their site plus an "honorarium" of Rp. 1,300 per month (twice the basic salary of the sub-district extension agent). Up to Rp. 1,000 went to the village chief for room and board and to a special fund to pay the expenses of monthly meetings of BIMAS students in the region. The payment of the "honorarium," however, was often late and occasionally less than prescribed. It was interesting to observe that the female students participated as fully as the male students. The only concession made to their sex was the practice of stationing them in pairs (boy-girl teams were tried at first but proved to be unsatisfactory).

In the 1967/68 BIMAS, each student was responsible for 400 hectares on the average, and there was little contact with the cultivators participating in the program.³⁴ Normally, the

34. The data about students is based on a questionnaire completed in February 1969, by 41 male students of Fakultas Pertanian, Universitas Gadjah Mada, Jogjakarta, who had participated in BIMAS 1967/68 in Central Java.

students communicated with the petani through special lectures. Most of their time was spent preparing and conducting these lectures, participating in koperta meetings, assisting in the distribution of credit, seeds, and fertilizer, supervising pesticide application, and measuring yields at the time of harvest. Usually, the students were not able to work individually with more than 100 or 200 cultivators--roughly 20% of the BIMAS participants in their assigned area. Considering that the students were at their sites for less than 200 days, their work with individuals could not have been very intensive.

Surprisingly, the extension agents expressed no resentment that the students were being paid so much despite their lack of experience. In general, the extension services indicated that they did not expect the students to be very effective as teachers of new agricultural techniques. Rather, their significant contribution consisted simply of their presence, which inspired the petani or exerted a "corrective psychological influence."³⁵ Elsewhere, the Government has explained its support of student participation in BIMAS by arguing that it builds character, trains the students to identify and solve problems, stimulates their imagination and creative thinking, and satisfies their appetite "for adventure in ideas and in action."³⁶

It was also interesting to observe that the petani and local officials appreciated the efforts of the students. Although the local people did not feel they had learned a great deal from the students, the prevailing sentiment was one of pleasure at the interest the students were taking in village life. Frequently, the statement was made that the students made BIMAS "*lebih sempurna*" (more perfect).³⁷ On the whole, it appeared that the greatest impact of the students was in conveying the concept of pantja usaha in a meaningful way to the petani.

As for the students themselves, they listed five benefits of participation in BIMAS: the opportunity to translate theory into practice and to learn where the two do not coincide; sharing their knowledge with the petani; experience in working with petani for those whose careers will lie in that direction; exposure to village life for those who have not been exposed to it and do not expect to be after graduation; and insight about diseases, local varieties of crops and local agricultural practices that is not available in the formal curriculum.

35. Pemerintah Indonesia, Rapat Kerdja Pangan 1968, Perkreditan, Working Paper No. 6 (Djakarta, 1968), p. 5.

36. Bachtiar Rifai, Mass Demonstration . . . (Djakarta, n.d.), p. 8.

37. However, there was a consensus that the participation of non-agricultural students (in 1966/67) was worthless.

Many students who participated in BIMAS also reported that the experience caused them to reorient the focus of their studies. Occasionally, this meant switching from a technical specialty to the socio-economy department of the Faculty, which emphasizes extension. More often, it meant minor changes of interests, as for example, from rubber tree diseases to coffee plant diseases because during his BIMAS service the student met a coffee estate manager who offered him a job after graduation. The only other faculties that have successfully organized the students to "*turun ke desa*" (descend to the villages) in keeping with the Three Aims of Higher Education are the medical faculties. The agriculture students take pride in their efforts to serve society and find they can assume positions of leadership in the university as a result of the experience.

BIMAS and the Petani

On Java, rice farmers generally considered BIMAS to be a good thing, as evidenced by demands that the program be continued in areas where it has operated already or that the program be established in areas not yet "BIMASed." In a number of places, the petani did not want any part of it or had had enough of it. But these areas were the most progressive ones, from an agricultural point of view, where the petani were accustomed to cultivating in accordance with *pantja usaha* and where the private sector was able to supply the modern inputs required. For the petani in these areas, BIMAS was more of a nuisance than a benefit.

As was mentioned in the previous section, the petani appreciated the participation of the students in BIMAS, although they did not claim to have learned a great deal from the students. Attendance at the lectures given by students was not remarkably good, but the reported reason was that most petani were occupied by other jobs (day labor, hair-cutting, cart rental, etc.) when they were not working in the fields. With regard to other aspects of BIMAS, the expected complaints were voiced about administrative inefficiency which caused the late arrival of fertilizer and pesticides, repayment in kind, high fertilizer prices, and low rice prices.

One of the cliches often heard in discussions of BIMAS was that the petani should be the "subject" rather than the "object" of the program. In other words, the petani should exercise control over the program, manipulating it to suit their needs instead of being pushed around by the program. The underlying idea was that BIMAS could only be successful if the petani took an active part in the program and thereby established a "vested interest" in it. In spite of the rhetoric, there was no evidence that the petani were playing any more than a passive role; certainly targets for the program were derived from the desires of

high-level planners rather than being aggregated from locally-determined objectives and capabilities. There were not even any institutional mechanisms through which the petani could participate in determining which plots would be eligible for the program.

The most important question about BIMAS is its long-term impact on rice cultivation. The aim of the program is clear enough: to make available to the petani the wherewithal necessary to cultivate rice at the high level of production required to make the nation self-sufficient without special efforts on the part of the Government.

The success of BIMAS must be measured, then, not simply by the increases in rice production that take place, but also by the degree to which the petani can maintain high yields with their own efforts. In the first case, it is clear that BIMAS has succeeded in achieving substantial gains, but for the second, the evidence is less certain. When this research was begun, two specific points of inquiry were the pattern of participation in BIMAS and the effect on yields when the petani left the program. Unfortunately, the research was not concentrated in any one location long enough to get satisfactory data on these points. A few general observations are made here, however, prefaced by the warning that the great variability between provinces, within provinces, and even among villages in a given district makes generalization very hazardous. The first observation pertains to the manner in which initial participation in BIMAS was determined. We have mentioned that the national targets were set with a view to maximizing the area covered given the restraints set by the funds, material, and personnel available. For all practical purposes, this national target was divided among the provinces through a bargaining process (the special management fee for BIMAS from the center being an important supplement to the funds budgeted for the Diperta by the provincial governments). In a similar fashion, targets were set by the provinces for each kabupaten, by the kabupaten for each ketjamatan, and by the ketjamatan for each *kulurahan* (village). The village chief then had to decide which of his petani could participate in BIMAS, and the criterion of giving priority to those plots with the best potential for yield increases along with the minimum risk of crop loss was not always followed. Often there were simply more plots in the village that qualified than there was credit available. It was also necessary to take into account that if there were mills in the vicinity, a portion of the village sawah had to be planted in sugar cane. Generally political factors seemed to prevail in deciding which petani participated in BIMAS, but precisely how was impossible to determine.

The second observation pertains to the length of time (number of consecutive seasons) that individual petani were able to participate in BIMAS. In the academic discussion, there was a

consensus that a petani must participate for three to five consecutive seasons before becoming *berdikari*.³⁸ In practice, however, participation for that long occurred infrequently. In fact, as a matter of policy in East Java, petani were eligible to receive BIMAS credit only once. In Central Java, this was generally the case, not as a matter of policy but because the village chiefs were compelled to give everyone a chance to participate. On an average, it is likely that the majority of petani participated for between one and two consecutive seasons.

The third observation concerns the behavior of yields when participation in BIMAS was terminated. Here the estimates were most contradictory. Curiously, students and local leaders shared the view that yields did not fall, but higher-level authorities believed that yields fell if the petani did not participate in BIMAS for at least two consecutive seasons.³⁹

The concluding observation relates to the specific question of how many petani were *berdikari* because of BIMAS. Again, due to the limited scope of the research, it is not possible to do any more than state a belief that BIMAS succeeded in making some petani *berdikari* who would not have been otherwise. In general, it should be noted that the achievement of this independent state has not been due to the activity of *koperta*. Rather, it has been a question of combining the availability of modern inputs (seeds, fertilizer, pesticides) with knowledge about their use--all within the context of favorable price relationships.

As a final note for this review of BIMAS as it appeared in 1968, the differences between regions are stressed once again. The preceding observations are most applicable to Java, specifically Central Java. BIMAS in Bali has been conducted on a somewhat haphazard basis partly because there was no agricultural faculty in Bali until 1967, partly because the *Diperta* has been grossly understaffed, and partly because the Balinese are among the most progressive farmers in Indonesia already. In South Kalimantan, BIMAS was considered to have failed in the last three seasons, mostly because the petani are so backward--not "fertilizer-minded," fearful that pesticides will kill their livestock, more interested in petty trade than in farming. In North Sumatra, BIMAS has not done well because of the lack of preparation, both of students and of petani, and serious difficulties encountered in supplying fertilizer. Outside of Java, the only major rice-growing area making progress in raising rice production was South Sulawesi (which was not visited in the

38. Berdikari, an acronym from "berdiri atas kaki sendiri," means "standing on one's own two feet."

39. In my opinion, conclusive research on participation patterns and yield patterns would be more beneficial than research on any other aspect of BIMAS.

course of this research), and apparently BIMAS did not have as much to do with that province's success as had the dynamism of local leadership.

Conclusion

It is too early to evaluate BIMAS thoroughly. Quite possibly, sufficient data will never be available to do the program justice. Nevertheless it does seem possible to discern the general tenor of the conclusions which would emerge. As successes, BIMAS can count the involvement of students in development and the spread of pantja usaha. It has also been responsible for some increases in production, but whether these have been worth the effort or not remains to be established by comprehensive cost-benefit calculations. What was the full cost of the program, including administrative costs and opportunities foregone? What was the value of the increased production plus the benefits of student participation?

The growth of the program may be interpreted as a positive indication of the Indonesian government's ability to carry out development programs. At the same time, the sharpest lesson of the BIMAS experience is that the rapid expansion of a national program of this nature is likely to be counterproductive--once the point has been reached where leadership is so diluted that it loses its leverage. The most striking feature of the statistics on BIMAS is the progressive decline of average yield increases among BIMAS participants as the program grew (3.5 tons of stalk padi per hectare in 1964/65; 1.6 tons per hectare in 1968/69--anticipated). Whereas the area of the program increased forty-fold in the first four years of the program (11,000 hectares to 470,000 hectares), the total increase in rice output attributable to BIMAS grew only twenty-fold (37,000 tons of stalk padi to 752,000 tons).

A balanced evaluation of BIMAS must also consider the alternatives. First of all, it needs to be demonstrated that self-sufficiency in rice production is the proper objective for Indonesia at this time. There are economic costs involved in reaching that objective about which few people seem to be concerned, as for example, the loss of relatively cheap P.L. 480 rice in the event that Indonesia has the kind of rice boom recently experienced in the Philippines. Even defining the point of self-sufficiency is a complicated issue: is domestic production sufficient to maintain the present level of per capita rice consumption (approximately 90 kg. per capita per year) the point of self-sufficiency, or is that point only reached when the 1900 level of consumption (110 kg.) has been restored? Second, it is necessary to determine whether price incentives alone can be effective enough in increasing rice production to make a national program such as BIMAS unnecessary. Or possibly (but improbably),

the best approach to increasing production is to rely on private sector sponsorship of programs like BIMAS CIBA. Finally, some minor institutional modification of the koperta might be enough to transform the koperta from playing a passive role to playing an active role in agricultural development.

In any case, Indonesia's attempt to achieve self-sufficiency in rice production in general, and the BIMAS program in particular, are fascinating and fruitful areas of study for scholars interested in Indonesia's development. Preliminary estimates for the 1969 rice crop, issued by the Agriculture Ministry in August 1969, indicate that the harvest will fall short of the target for the first year of the new five-year plan, thereby casting some doubt on the likelihood of self-sufficiency in 1973 as anticipated in the Plan. Nevertheless, history does not always repeat itself, and the sincerity of the present effort suggests that it will succeed where previous efforts failed. One of the most encouraging aspects of the BIMAS effort is that it was originally conceived by Indonesians and was tailored to the Indonesian setting rather than copied from another country or derived from some abstract model. To carry the analogy further, while the basic pattern is sound, some modifications are necessary to make the program *tjotjok* (fit perfectly). In fact, the proper prescription probably involves reducing the program closer to the small size that existed when its success was so pronounced--at least until the administrative/logistical/technological capabilities of the nation improve enough to support a larger program.