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STAFF APPRAISAL REPORT

INDONESIA

THIRD NATIONAL AGRICULTURAL EXTENSION PROJECT

(REVISED)

February 26, 1988

Agricultural Division
Indonesia Country Department
Asia Regional Office

BEST AVAILABLE COPY

CURRENCY EQUIVALENTS

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(metric system)

GLOSSARY AND ABBREVIATIONS

AAETE	- Agency for Agricultural Education, Training, and Extension (BAE)
AARD	- Agency for Agricultural Research and Development
ADAB	- Australian Development Assistance Bureau
AHO	- Animal Health Officer
AHP	- Animal Health Post
AIC	- Agricultural Information Center
AUP	- Akademi Usaha Perikanan - Fishery Business College
BAE	- Bureau of Agricultural Extension (AAETE)
BAPPENAS	- Badan Perencanaan Pembangunan Nasional -- National Development Planning Agency
BIMAS	- Bimbingan Massal -- mass guidance: a system for organizing agricultural extension activities accompanied by provision of production input packages and credit in order to increase agricultural production through the intensification of secondary rice crops, horticulture, livestock, fisheries, and estate crops and thus improve the welfare of farmers and their families
BPMUC	- Bendaharawan Pemegang Uang Muka Cabang -- regional treasurer
BRI	- Bank Rakyat Indonesia -- People's Bank of Indonesia
BUUD	- Badan Usaha Unit Desa -- Village Unit Cooperative (not incorporated)
BULOG	- Badan Urusan Logistik -- National Logistic Board
Bupati	- District Administrative Head
Cipta Karya	- Directorate General for Buildings and Urban Development
DGE	- Directorate General of Estates
DGF	- Directorate General of Fisheries
DGFC	- Directorate General of Food Crops Agriculture
DGL	- Directorate General of Livestock
Diklat APP	- Pendidikan dan Latihan Ahli Penyuluhan Pertanian -- Education and Training for Agricultural Extension Specialist
Dinas I/II	- Provincial/district services
DIP	- Daftar Isian Proyek -- approved GOI budget
FKPP-I	- Forum Koordinasi Penyuluhan Pertanian Tingkat I -- Forum for Agricultural Extension Coordination, provincial level
FKPP-II	- Forum Koordinasi Penyuluhan Pertanian Tingkat II -- Forum for Agricultural Extension Coordination, Kabupaten level
Gotong-royong	- Community working together without pay
ICB	- International competitive bidding
INMUM	- Intensifikasi Umum -- general intensification
INSUS	- Intensifikasi Khusus -- special intensification

IPB	- Institut Pertanian, Bogor -- Bogor Agricultural University
ISTC	- In-service training center
Kabupaten	- District administrative area
KAKADEP	- Kepala Kantor Departemen Kabupaten -- Head of Ministry of Agriculture's representative, district level.
KABUPATEN	- Kepala Kantor Wilayah -- Head of Regional Office, Minister of Agriculture's representative, provincial level
KAKANWIL	- Kantor Wilayah -- Regional Office, provincial level
KANWIL	- Kantor Wilayah -- Regional Office, provincial level
KPPN	- Komisi Penyuluhan Pertanian Nasional -- National Commission for Agricultural Extension (NCAE)
KUD	- Koperasi Unit Desa -- Village Unit Cooperative
LCB	- Local competitive bidding
Maphalus	- Movement for food self-sufficiency in North Sulawesi
MOA	- Ministry of Agriculture (Departemen Pertanian)
MOT	- Ministry of Transmigration (Departemen Transmigrasi)
MOC	- Ministry of Cooperatives (Departemen Koperasi)
NCAE	- National Commission for Agricultural Extension (KPPN)
NFCEP	- National Food Crop Extension Project (Loan 1267-IND)
NES	- Nucleus Estate and Smallholders Project
NAEP II	- National Agricultural Extension Project II (Credit 996-IND)
Palawija	- Secondary food crops, food crops other than rice
PIR	- Perkebunan Inti Rakyat -- GOI-financed Nucleus Estate and Smallholder Project
PIU	- Project Implementation Unit
PMU	- Project Management Unit
PPL	- Penyuluh Pertanian Lapangan -- field extension worker
PPM	- Penyuluh Pertanian Madya -- senior field worker at REC, recently renamed as PPUP
PPS	- Penyuluh Pertanian Spesialis -- subject matter specialist
PPUP	- Penyuluh Pertanian Urusan Program -- agricultural extension programmer at REC
PTP	- Persewaan Terbatas Perkebunan -- Government's Estate Enterprise
PUMC	- Pemegang Uang Muka Cabang -- regional treasurer
Pusat	- Headquarters, center
REC	- Rural Extension Center
REPELITA IV	- Fourth Five-Year Plan, 1984-1989
SATGAS	- Satuan Tugas -- Task Force of Livestock Services (animal health, extension, and husbandry workers)
SOE	- Statement of Expenditures
SPHB	- Sekretaris Pelaksana Harian BIMAS -- BIMAS daily executive unit
Subak	- Water User Association in Bali
T & V	- Training and Visit -- a system of agricultural extension
UKB	- Uang Kerja Bimbingan -- funds for extension work (a subheading in budget tables)
UNDP/DTCP	- United Nations Development Programme/Development Training and Communication Planning -- a regional support program based in Bangkok
UPP	- Unit Pelaksana Project -- Project Management Units of Estate Crop Department at field level
VAT	- Value-added tax
VU	- Village Unit
WKBPP	- REC geographical working area

INDONESIA
THIRD NATIONAL AGRICULTURAL EXTENSION PROJECT
(REVISED)^{1/}

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^{1/} The original appraisal report was revised during October - December 1987 by Messrs. Lindt, Russell and Wiranto (World Bank Staff) and Clark (Consultant) in close collaboration with staff of the Project Implementation Unit in AAETE and other Government of Indonesia staff involved.

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MAP

1. IBRD 19132R -- Project Provinces

I. BACKGROUND

A. The Status of Agricultural Extension in Indonesia

1.01 Before 1974 each Directorate General within the Ministry of Agriculture had its own extension service. Some of the Directorates General, such as Food Crops (DGFC), had their own Directorates of Extension but other Directorates General combined production and extension functions under one Directorate. With the establishment of the Agency for Agricultural Education Training and Extension (AAETE) in 1974, all Directorates of Extension at the national level were disbanded, with some of their personnel transferring to AAETE. With the exception of the provincial food crop agricultural services, extension bureaus within the provincial agricultural departments of other subsectors were also disbanded. However, the food crop field extension workers (PPL) and subject matter specialists (PPS) recruited under the centrally funded BIMAS program for rice production were not transferred to AAETE, but continued to remain administratively under the BIMAS directing board and technically under DGFC. The Director General of Food Crops, who was the Secretary of BIMAS, thus had a large contingent of extension workers.

1.02 Without a central funding source equivalent to BIMAS, the other Directorates General, unlike DGFC, did not have PPLs, PPUPs, and PPSs, and consequently hardly any extension activity for smallholders. They maintained their development operations by hiring field technicians using specific project budgets, restricting extension work for nonfood crop subsectors to special target areas. Smallholder activity in the other subsectors is primarily a matter of establishing and maintaining long-lived capital assets, such as stands of tree crops, animal herds, and fish stock. Field work in these subsectors thus typically concentrates on assisting small localized numbers of farmers to establish those assets (e.g., via rubber and coconut replanting programs), involves a considerable amount of credit or grant finance per farmer, and often entails stationing field staff at physical facilities (e.g., latex and copra processing centers, sugar factories, tobacco barns, and demonstration fish ponds). Staff so stationed are unavailable to meet farmers regularly and are unable to maintain close contact with them other than for credit recovery purposes after the establishment phase. The status of extension services in the nonfood crops is described below.

1.03 Estate Crops Extension Service. In NES, PIR, and PMU areas, which cover about 30% of the area under estate crops, extension services are being provided alongside the provision of inputs, credit, and in some cases processing and marketing. Extension advice is continued when smallholders obtain title to their own plots. PTPs are currently in the process of devising more comprehensive programs to oversee for a period of up to 25 years from crop establishment. Typically, PTPs providing extension and input services to smallholders have an average of 1 extension officer for every 250-300 families. Smallholders on the 70% of the estate crop area that is outside NES, PIR, and PMU areas receive little extension service.

1.04 Livestock Extension Services. The Directorate General of Livestock (DGL) has established Units of Technical Management (UPT) in the provinces to provide seed, fodder, and breeding stock; artificial insemination; disease investigation; and quarantine services. At the district level, DGL field

services are organized by field supervisors, at the subdistrict level by mantris or assistant field livestock officers (AFLO). An average of 1 AFLO is available for every 10-15 villages and 10 AFLO for a typical district with 100-150 villages. Most field time is spent on veterinary tasks, little attention being paid to livestock production, and contact with farmers is generally poor because of lack of an adequate number of village level extension workers. Under a livestock project being funded by the International Fund for Agricultural Development (IFAD), PMU staff have been organized into provincial level task forces (SATGAS) in the stock procurement areas, and into subdistrict level task forces (SATGAS) in distribution areas. In addition to organizing project and credit activities, these SATGAS provide livestock services (extension and animal health services) to project beneficiaries.

1.05 Fishery Extension Service. The Directorate General of Fisheries (DGF) has established (a) a Brackish Water Aquaculture Development Center at Jepara, (b) a Freshwater Aquaculture Development Center at Sukabumi, (c) a Marine Fishery Development Center at Semarang, (d) a Fishery Product Development and Quality Control Center at Jakarta, and (e) a Marine Aquaculture Development Center at Lampung for adaptive research, training, and preparation of extension materials. To strengthen the work of the provincial governments in conducting extension activities, the centers have established specialized extension development units in a few provinces. These extension development units are responsible for field trials, demonstrations of fishing methods and techniques, fish culture training of extension workers, contact with fishermen and fish-farmers, and the supervision and monitoring of extension activities. However, due to an inadequate number of field extension workers, and a lack of a systematic approach, appropriate extension messages do not reach most of the fishermen.

B. Bank Group Involvement in Agricultural Extension

The National Food Crop Extension Project (NFCEP)

1.06 The Bank's involvement in assisting the improvement of field extension services for food crops began with extension components in irrigation projects, whereby a version of the training and visit system of extension 1/ was progressively introduced in irrigation command areas. In view of the large role that agriculture plays in the Indonesian economy and the relatively low productivity of food crops, tree crops, aquaculture, and animal husbandry, GOI sought the Bank's assistance at about the same time that AAETE was created to expand and improve its extension services. There were two alternatives: either to have separate extension projects under each Directorate General, or to unify the extension services under AAETE. After considerable deliberation, GOI decided at that time that, while creation of a unified extension service under AAETE was a desirable goal, a major

1/ This system is described in detail in a Bank publication entitled "Agricultural Extension: The Training and Visit System," by Daniel Benor, James Q. Harrison, and M. Baxter (1984).

reorganization would seriously disrupt the program for increasing rice production. Consequently, the Government chose to focus on improving and rationalizing the extension services under the DGFCFA. In 1976 the Bank approved the National Food Crop Extension Project (NFCEP: Loan 1267-IND) under the DGFCFA; it originally covered nine provinces and was later extended to an additional four provinces.

1.07 Under the NFCEP the link of the food crop extension service with the BIMAS program was preserved, but NFCEP deviated from the BIMAS program in several positive ways: (a) extension services were provided to all farmers, not only to BIMAS participants, in advance of other components of the BIMAS package in the project area; (b) agricultural extension programmers (PPUPs)^{1/} were created and additional PPSs were recruited under the project, although the salaries of PPLs, PPUPs, and PPSs were paid through the BIMAS budget; (c) Rural Extension Centers were created, the basic modules around which the extension service was built; each REC serviced 15,000-25,000 farm families and was staffed with 2 PPUPs covering 10-12 PPLs; and (d) the training and visit system of agricultural extension was introduced.

Second National Agricultural Extension Project (NAEP II)

1.08 As the NFCEP was operating well in the 13 project provinces and parts of Lampung, areas that include nearly 80% of the farm population of Indonesia, demand grew for other provinces to be covered. Moreover, it was felt that the time had arrived to introduce, selectively and in phase, extension information for nonfood crops and smallholder livestock and fisheries, in areas where those activities provide major components of farmers' incomes. This step was considered important both to effectively utilize the information delivery system already developed for food crops, and to improve the effectiveness of food crop extension. The Bank approved the Second National Agricultural Extension Project (Cr. 996-IND) in 1980 with the principal objectives of (a) strengthening food crop extension services in a further group of 13 provinces not covered by NFCEP; (b) establishing an integrated extension service for transmigration areas; and (c) incorporating extension activities for smallholder estate crops, animal husbandry, and inland fish culture into the basic extension program and delivery system heretofore exclusively utilized for food crops.

1.09 NAEP II had been managed at the national level by the NFCEP project unit under the jurisdiction of the DGFCFA, pending completion of an organizational study aimed at examining ways of unifying agricultural extension services under AAETE's coordination. All PPLs, PPUPs, and PPSs have been paid through the BIMAS budget. The RECs have been constructed through the provincial and district food crop services, mostly in predominantly food crop areas, and have been controlled and maintained by the DGFCFA.

^{1/} Prior to 1987, PPUPs were known as PPMs.

Experience with Past Lending

1.10 The agricultural extension services, especially the food crop extension service, has been considerably strengthened under the above projects. Compared to 3,960 PPLs, no PPUPs, and 179 PPSs at the beginning of NFCEP (early 1976), the numbers have increased to 22,162 PPLs (including PPUP) and 796 PPSs at the beginning of 1986. There are now approximately two PPUPs in each REC and two PPSs in each district. Under the 2 projects, 1,402 RECs had been constructed or rehabilitated mainly in lowland rice areas and in some transmigration areas. All RECs have been provided with furniture and equipment and vehicles have been purchased. In-service training has been provided to about 26,000 extension personnel and overseas training to about 400 persons. Both the projects thus far have extended mainly information on rice, with limited attention paid to fruit, vegetables, and secondary crops. The major agricultural impact of the project has been its remarkable success in combating the severe attacks of brown plant hopper in the main rice areas during 1976-77. In the years following the outbreak, the expanded corps of field workers has promoted a shift by hundreds of thousands of small farmers to recently released resistant rice varieties and increased usage of fertilizers and effective insecticides. Although the extension service alone cannot claim all the credit, it has contributed significantly to the increase in rice production from about 13 million tons in 1976 to about 26 million tons in 1985.

1.11 Although one of the objectives of NAEP II was to strengthen extension services for estate crops, livestock, and fisheries, these services still remain weak. At the beginning of 1986, there were 6,075 PPLs + PPUPs and 29 PPSs in estate crops, 2,170 PPLs + PPUPs and 153 PPSs in livestock, and 1,698 PPLs + PPUPs and 193 PPSs in fisheries extension services. The DGs other than DG Food Crops could not create additional positions for extension officers out of BIMAS funds as there was no national policy to that effect, and therefore had to remain content with the few positions they could create out of specific project funds. These three DGs were, in effect, operating outside the purview of NAEP II. Very few of these extension staff received any training, and they spent a disproportionate amount of their time in regulatory, licensing, and data collection work rather than in disseminating extension information.

1.12 Partly as a result of the above shortcomings, considerable discussion has taken place over the past years regarding appropriate measures to unify the extension services. In a national workshop on the subject in 1982, at which all DGs and AAETE participated, two important decisions were taken as steps toward unification: (a) the name of the RECs was changed to refer to the Ministry of Agriculture (rather than DG Food Crops), and RECs were offered to all DGs to be used as focal points for extension; and (b) DGs were requested to use, as far as possible, the nationwide network of farmer groups organized by the food crop extension service. However, the DGs of Estate Crops, Livestock, and Fisheries showed little inclination to use the existing network of RECs as bases for their respective extension services for two main reasons. First, most of the RECs were managed and controlled by DGFA and were thus not perceived as a joint facility. Second, there were few RECs in remote geographical areas where estate crops, livestock, and fishery activities are concentrated.

1.13 Government has recognized that the structural and functional divisions in the extension organization, as they existed until 1983, have been causing operational inefficiencies. At the field level it was difficult to integrate the extension function for all crops in a system dominated by the food crops extension infrastructure. There has also been a mismatch between demand for training of extension staff under the DGs and AAETE's capability to meet that demand. The effectiveness of the Agricultural Information Centers, under AAETE, has been impaired by the structural separation of producers/disseminators and users of information. The linkage between research and extension is also weakened by the splintered extension apparatus.

1.14 To address these institutional weaknesses, the Government made the following changes in the latter part of 1983 and early 1984:

- (a) AAETE. By a Ministerial Decree issued in 1984, AAETE was given overall responsibility for coordinating extension at the national level and formulating extension policies and methodology. Consequently, management of NAEP II, which supports the extension activities of all subsectors, was transferred from the DGFC to AAETE on April 16, 1984. New coordination forums at the national, provincial, and district levels were established by Ministerial Decree No. 482 issued July 3, 1985.
- (b) Directorates General. Realizing the contribution of the food crop extension service to rice production and the intimate relation between extension and production, GOI, under Presidential Decree No. 24/1983, created Directorates of Extension under all four Directorates General. At the same time, AAETE retained its Bureau of Extension. The Directorates of Extension are responsible for exerting technical and operational control over the extension staff and formulating extension programs to fit the needs of specific commodity production programs (Charts 4a and 4b), while the Bureau of Extension of AAETE is responsible for carrying out studies for improving the extension program, methods, and formulation of extension methodology and policies (Chart 5).
- (c) BIMAS Directing Board. The BIMAS Directing Board Secretariat is responsible for administering the agricultural extension personnel of all subsectors and for synchronizing provision of inputs, credit, marketing, and cooperative development. In pursuance of the Minister of Agriculture Decree No. 143/KPTS/LP.400/31/1985, handover of the extension personnel from DGs and AAETE to BIMAS was completed by March 31, 1986. BIMAS is also responsible for administrative control of RECs constructed by DGFC which have not been handed over to local government.

1.15 The transfer of NAEP II from DGFC to AAETE caused some problems in implementation. Between December 1983 and April 1984, all project activities were practically at a standstill. The Project Director, five out of six

Assistant Directors, and several junior officers of the project unit transferred to the offices of the Directors General and BIMAS. AASTE appointed a new Project Director and filled some of the vacancies, but it took the new project management some time to come to grips with the situation. The new management of NAEP II had to evolve different procedures for implementation of civil works to fulfill the requirement of new decrees. Considerable time was spent collecting the supporting documents for applications for withdrawal from the offices of KANWIL of Agriculture, through whom civil works were earlier implemented by the DGFA. Some additional RECs in nonfood crop areas are being constructed in line with the new policy of strengthening extension services of other subsectors. All physical activities were completed by June 1987, about 15 months behind schedule. An additional component to conduct Integrated Pest Management Training for staff and farmers in all provinces to combat increased threat from brown plant hopper was carried out between January and June 1987. When the credit closed on September 30, 1987, almost all the credit funds had been fully utilized.

C. The NAEP III Project and Rationale for Reformulation

1.16 The NAEP III project was designed to strengthen extension services covering estate crops, livestock and fishery activities, in addition to food and horticultural crops, in all provinces through provision for an increase of 10,000 additional trained extension personnel, and the construction of 400 additional RECs in areas not covered by earlier projects. The project also provided additional vehicles and equipment, limited extension worker housing, training, and technical assistance. It planned to rationalize the extension service by integrating the PPLs, PPUPs, and PPSs of subsectoral extension services into one unified extension service.

1.17 Although the project became effective in October of 1986, it was agreed that it would not start activities until the 1987/88 GOI financial year because ample funds remained in NAEP II. However, when the year began, Indonesia's economic position made it extremely difficult for the Government to provide sufficient funds for existing RECs to operate effectively, which called in question the rationale for further expansion of the service. Furthermore, inadequate funds in each of the four agricultural services at provincial level, and GOI's inability to allocate them any funds to provide their technical input from project sources, made these services both reluctant and often unable to support their commodity programs at the REC level, this undermined the whole philosophy of providing an effective unified service. Finally, although the forum committees at FKPP level were meeting, there was no explicit single line of responsibility and thus no way to ensure that their deliberations were translated into action. These management and organizational weaknesses had been fully documented in a four-month study under NAEP II conducted during the October 1986-March 1987 period by a team of consultants from Pusat Pengembangan Agribisnis. Therefore it was agreed that the project would be reformulated to address these issues of finance, management, and organization.

1.18 Methodology for Reformulation. Following a meeting of the KPPN, two teams were set up comprising staff from each of the agencies concerned and the Ministry of Home Affairs to review both the financial issues and those

concerning organization and management. The problems were reviewed in detail in three provinces - East Java, Riau, and East Nusa Tenggara - and the teams reported back to the KPPN, which in subsequent discussions with Bank staff agreed on a way to resolve these issues.

II. Development of a More Effective Agricultural Extension Organization

A. Resolution of Key Issues

2.01 The three key issues that required attention during reformulation can be summarized as follows:

- (a) Insufficient funds in the 1987/88 budget to operate the existing extension service effectively;
- (b) The lack of a single line of command, which weakened implementation: extension programs were approved in the extension forum committees (FKPP I and II), but no single individual was charged with carrying them out; and
- (c) Weak coordination - although extension activities involved six agencies in the Ministry, the project only directly provided funds for one of them, AAETE, and consequently the four Directorates General and BIMAS Directing Board and their agricultural services in the provinces did not feel sufficiently involved.

2.02 Finance. During reformulation, an assurance was given by GOI that funds would be provided in the development budget for the effective operation of extension, and that in 1988/89 and thereafter at least as much funding as set for this year would be provided. As 11,000 staff now classified as honoraria and paid from the development budget would become civil servants and receive salaries in 1988/89 from the routine budget, the whole sum currently used to pay them would become available to raise present inadequate levels of funding for each REC to an acceptable level (see Para 3.04).

2.03 Line of Command. A single line of responsible officers (see chart 6) would be set up to oversee effective extension delivery. At the provincial level, the Head of the Extension, Education, and Training Division in the KANWIL office would be made responsible for overseeing and reporting to the FKPP I on the implementation of all decisions reached there on the conduct of the extension program, under the overall direction of the KAKANWIL and act, in effect, as the Provincial Extension Officer^{1/}. At the district level, the Secretary of the BIMAS District Executive Unit would carry out the same role vis-a-vis the FKPP II under the overall direction of the Head of the BIMAS District Executive Consultative Unit at the district level as Chairman of FKPP II; he would in effect be the District Extension Officer^{1/}. All REC Heads in the district would be responsible to the Bupati through the Secretary of the BIMAS District Executive Unit for carrying out the agreed extension program.

^{1/} It should be noted that the terms "Provincial" and "District Extension Officer" used here reflect the activity of each of the two people concerned, and do not imply a new official organization.

2.04 Coordination. This structure would be further strengthened, in addition to the provision of Para 2.02 above, by having all four commodity-based Directorates General and the four Dinas at the provincial level involved in the project via the provision of specific project funds for them to carry out their agreed technical support and supervisory role. Each province would have a sub-PIU in the KANWIL; the sub-PIU manager (Kuasa Pimpro) would be the Head of the Extension, Education, and Training Division in the KANWIL office. Funds for project activities would flow through that office to each of the participating agencies in the province.

2.05 These three key changes, which are essential for the NAEP III Project to be implemented effectively, would be supplemented by further adjustments in approach and organization to meet the new economic realities, and for the need to support an expanded program of agricultural diversification in Repelita V. This would require a shift from a largely commodity-oriented approach towards a strategy that would maximize farm incomes and employment and promote crop diversification based on market signals.

B. Proposed Changes in Approach

Improved Technical Recommendations

2.06 The strategy for maximizing farm income and employment will require the development of more location-specific technical recommendations. These would be based on production potential assessed on a geographic regional basis within a matrix identifying each region's varying agro-ecological zones. The smallest building block for planning purposes should be the REC working area (WKBPP), with the REC becoming the unit for aggregating human and natural resource potential. The data derived from this methodology could be further aggregated as a basis for district and provincial plans, which to be effective would require provinces to organize adequate support from AARD research staff into the training of PPSs and assisting with the development of location-specific recommendations. AARD research stations should then have not only a national mandate, but also a regional one to meet the needs of farmers in the provinces in or near which stations are located. Research findings are reviewed by agricultural Dinas staff at provincial level and after approval are adapted by PPS into recommendations for farmers.

Emphasis on an Educational Approach to Extension

2.07 This strategy also implies a bottom-up planning approach with more choices or alternatives provided to farmers taking into account the national and regional strategy focusing on food self-sufficiency. The new focus of such an educational approach should provide farmers with relevant technical and financial information on various enterprises suitable for their agro-ecological zone. They can then choose in accordance with relative profitability, risk assessment, management requirements, and their own personal inclination. It will of course require more location-specific research, the production of farm management handbooks on the relative costs and returns to investing in varying enterprises, better market intelligence, and improved access to institutional credit. Thus much closer liaison between PPS and research staff from AARD is needed on the one hand, and between staff from the economics and marketing departments of each Directorate General (foodcrops, estate crops, livestock, and fisheries) on the other.

Stratification of Farmers into Sub-Groups

2.08 The new approach would also show more sensitivity to the needs of farmers with different resources by stratifying types of farmers within farmer groups and developing varying recommendations for each of them. A present problem is that the large mass of poorer farmers cannot copy the lead given by farmer leaders (Kontak Tani) and other progressive farmers. Since farmer leaders and progressive farmers often have more resources than many of their peers, risks are usually too great for smaller-scale, resource-poor farmers to follow their example (this also pertains to households largely dependent on off-farm income where the wife is left to run the farm). Farmer groups need to select from within their number additional farmers who are representative of such householders and those selected should demonstrate specially prepared risk-averse programs more suited to their stage of development for other similar farmers in their subgroups. Some farmer groups already select different farmers with varying expertise to be their specialists on particular types of crop or livestock enterprises so it is they who attend the relevant skill course. This is now becoming accepted as general policy in farmer group development. The whole approach is one of partnership between the extension worker and the farmer, with farmers gradually becoming more self-reliant. They will also have a larger say in the running of their local REC, and may even contribute to its upkeep or improvement. A special study will be carried out under the project to improve the methods of working with farmer groups, and produce new policy guidelines for review and subsequent implementation by the NCAE (Para. 4.23b).

Improved Agricultural Processing and Marketing

2.09 Increasing incomes and employment in rural areas will require that much more attention be given to agricultural processing and marketing. Value should be added to produce at the farm level by improving quality, grading, and packaging or further processing. This will require improved identification of market quality requirements, better knowledge of appropriate seasonal timing, and review of existing regulations and incentives that would require closer liaison with the Ministries of Trade and Industry. This has obvious implications for the training program for both staff and farmers under the project, and of coordination with other Ministries concerned with agro-industry and marketing.

C. Improved Operations of the National, Provincial, and Local Level Institutions

Strengthening National Level Technical Support

2.10 The technical support functions of each of the national bodies (AAETE, the four subsector Director Generals, and BIMAS) would be strengthened in respect of development of materials and methods for extension and training, the conduct of courses at national institutes for PPSs, supervision, and monitoring and evaluation. The Agricultural National Training Center at Ciawi (coordinated by AAETE), the DG Fisheries' five fishery centers at Semarang, Jepara, Sukabumi, Jakarta, and Lampung, DGE's two estate crop centers at Yogyakarta and Medan, and other training centers under the Ministry of

Reviewing Extension Methodologies

2.14 AAETE has the mandate to review extension methodologies and, as part of its monitoring activity, will review progress on all donor or GOI projects that have significant extension components (Para. 6.22). The agency can then keep abreast of new cost-effective initiatives that could help improve the overall national extension approach, or improve extension in a specific agro-ecological zone.

III. FINANCING OF AGRICULTURAL EXTENSION SERVICES

A. Methods of Funding

3.01 The agricultural extension services in Indonesia are carried out by various agencies within the Ministry of Agriculture. In addition, the local government (provincial and kabupaten) is also responsible for a certain part of the organization and management of the Dinas. Accordingly, funding of agricultural extension services is channeled through different agencies. AAETE is the responsible agency for the overall conduct of agricultural extension, mainly for the policy, training and education, production of agricultural extension material, and implementing the national agricultural extension project (NAEP). Therefore funds for carrying out these tasks are allocated in the AAETE's development budget (DIP). The administration of extension personnel (PPSs, PPUPs, and PPLs) is the responsibility of the BIMAS Secretariat; thus the BIMAS development budget (DIP) contains funds for extension staff's salary, allowances, and operational expenditures. Because support for technical extension packages and skill training for the PPLs/PPUPs and farmers are provided by the Directorates General and the respective Dinas in the provinces and kabupatens, funds for these activities are also allocated in the DG's DIP and in the provincial/kabupaten's DIP. The complexity of this arrangement calls for very strong and effective coordination at national as well as provincial levels to avoid any overlapping and duplication; it falls to the NCAE and FKPPs to ensure this coordination.

3.02 The budget funding is divided into two categories, namely, (a) routine budget, which includes salary of the regular staff and several allowances, and (b) development budget, which includes the investment, operation, and maintenance expenditures, honoraria for temporary staff (or honorary staff), and operational allowances.

B. Historical Trends in Funding of Agricultural Extension Services

3.03 At the beginning of Repelita IV (1983), the Ministry of Agriculture was reorganized and agricultural extension was given more priority through the reinstitution of the Directorates of Extension in the 4 Directorates General (Food Crops, Estate Crops, Livestock, and Fisheries). Since then, the DGs have been allocated funds in their respective DIPs to operate their Directorates of Extension. Unfortunately, because of the financial difficulties faced by the Government from declining oil prices, GOI was not able to give more emphasis to agricultural extension as envisaged at the beginning of Repelita IV. The funds earmarked for carrying out the expanding agricultural extension supported by the Bank (NAEP II and III) were declining, especially for operational expenditures for the respective Directorates of Extension, as shown in the Table 3.1. Detailed examples for some of these expenditures are given in Annex 1, Table 4.

Table 3.1: GOI Funding for the Operation of Agricultural Extension
(development budget, see Para. 3.02)

Institution	GOI's FY			
	84/85	85/86	86/87	87/88
Rp million				
<u>AAETE</u>	3,560	3,872	2,432	970
<u>BIMAS</u>	13,310	13,807	19,152 <u>a/</u>	11,756 <u>b/</u>
<u>Directorate of Extension</u>				
Food Crop	4,904	3,341	668	149
Estate Crop	2,656	1,452	47	38
Livestock	1,393	841	74	43
Fisheries	3,580	3,478	396	134
T O T A L	29,403	26,791	22,769	13,090

Note: Excluding project funds.

a/ Reallocation of the honoraria and operational allowances for the PPLs/PPSs from the subsectors.

b/ Reallocation of the honoraria for temporary staff into salary in the routine budget.

It is not possible to include accurate data on extension activities carried out by other Directorates of the DGs in MOA (e.g., Plant Protection, Production, Economics, and Marketing, etc.) because it is not easy to separate them from non-extension activities.

C. Required Level of Funding for Effective Operation of Agricultural Extension Services

3.04 An effective and efficient agricultural extension service requires sufficient funding to carry out its proposed activities. At field level (RECs), extension workers should be provided with adequate allowances to visit individual farmers or groups, to conduct demonstrations in collaboration with farmers, and to supply them with enough extension packages, material, and appropriate equipment. Regular training to keep workers abreast of new technology development and to improve their skills as part of the T & V system also requires an assured funding level. An assurance would be obtained from GOI that they would provide not less than the minimum required funding every year, to avoid waste and losses from the heavy previous investment in infrastructure and human resource development. At current estimates, the funding needed for the extension services each year is about Rp 20 billion (for details, see Annex 1 Table 5). As the project costs would cover Rp.5 billion a year of the funding needed to ensure this effective operation of the extension service, GOI would have to provide not less than Rp.15 billion per year in its development budget outside the project for the existing extension service for which an assurance would be given as a condition for the reformulated project (Para 8.01).

3.05 To ensure that the proposed activities are properly implemented, they must be supervised at the various levels, and the supervision adequately funded. Coordination meetings are also important for the NCAE, FKPP-I, and FKPP-II, so that these groups can agree on the work program for the next period/month and review the achievement of the previous period/month. For NCAE, six coordination meetings per year are adequate, whereas for FKPP a monthly meeting would be required. Workshops, another important part of extension activities, provide a forum for discussion and review of the performance of the ongoing extension program, and preparation of the program for the next season or year. Workshops at Kabupaten level should be conducted by FKPP-II seasonally and attended by the PPSs, Heads of the RECs, PPUPs, and Dinas staff as required. At the provincial level, there should be an annual workshop conducted by FKPP-I and attended by representatives from FKPP-II. In addition to their monthly meetings, 2-4 technical workshops per year would be organized for the PPSs with experts from the research stations and universities for each province, or for a group of provinces together. Based on the current estimates, the required level of funding for supervision and coordination activities is about Rp 1.1 billion per year (see Annex 1, Table 5 for details).

IV. THE REFORMULATED NAEP III PROJECT

A. Objective and Scope

4.01 The major objective of the project is to strengthen extension services covering estate crops, livestock and fisheries activities, in addition to food and horticultural crops, in all provinces through provision of an increase in trained extension personnel, vehicles, and equipment; new RECs in areas not covered by earlier projects; construction of limited extension worker housing; training; and technical assistance.

4.02 Project Scope. The revised project would provide:

- (a) an increase in extension staff by about 3,450 PPLs, 1,150 PPUPs, 600 PPSs, and 200 animal health officers;
- (b) construction of 230 new RECs, and procurement of required land (up to 2 Ha), in transmigration, upland, tidal swamp, estate crops, and livestock areas, and construction of additional extension worker housing for 210 PPLs in Irian Jaya and East Timor; construction of 200 animal health posts; and expansion of 490 existing RECs;
- (c) procurement of 3,828 motorcycles, 64 four-wheel-drive vehicles, 45 animal health mobile units, and 16 audiovisual mobile units;
- (d) procurement of furniture for new and expanded RECs, animal health posts, provincial level offices, and sub-PIU; basic and/or specialized subsectoral equipment for new RECs and animal health posts; computers for the Agricultural Information Centers; and additional equipment for PIU Headquarters;

- (e) procurement of audiovisual and printed extension materials;
- (f) conduct of verification trials by PPSs in all provinces; and establishment of demonstration plots, farms, and areas;
- (g) training of extension workers and staff and key farmers through a limited number of overseas courses and fellowships, and a large number of local training courses; and provision of related facilities;
- (h) operational support, monitoring and evaluation, and supervision; and
- (i) 4 man-years of long-term technical assistance in extension, monitoring and evaluation, and rural sociology, and about 15 man-months of specialist expertise to be designated during the course of project implementation.

B. Detailed Features

Project Staffing

4.03 Under the NAEP II, the PPL requirement was calculated as follows:

Transmigration areas - 1 PPL:500 families
Sparsely populated provinces - 1 PPL:600 families
Remaining Outer Island provinces - 1 PPL:800 families
Java and Bali - 1 PPL:1,600 families

4.04 During implementation of NAEP II, it became evident that the size of farmer groups was rather large for the PPL, and the diffusion of extension recommendations was slow. It was also apparent that more emphasis should be given to the estate, livestock, and fishery subsectors to cope with accelerated agricultural development. AAETE, therefore, proposed 1 PPL for 640 farm families in Java and Bali and 1 PPL for 400 families in the Outer Islands in NAEP III. Based on the proposed ratio, a total of 44,000 PPLs would be required by 1989. Considering the budget constraints of GOI, availability of agricultural graduates from high schools, and past performance, it was felt that a more realistic target for recruitment of additional PPLs would be 3,450 under NAEP III, at the rate of 15 PPLs per new REC. Out of 3,450 PPLs, 657 PPLs would be required for transmigration areas. All new PPLs would be graduates from agricultural high schools where they undergo three years' training in food crops, estate crops, livestock, and fisheries (Diploma III).

4.05 A total of 1,150 additional PPUPs would also be required to achieve a rate of at least 2 and a maximum of 5 PPUPs per REC, excluding the REC Chief. As PPUPs are not recruited directly but are promoted from among the more experienced and successful PPLs, in addition to the 3,450 PPLs under the project, a further 1,150 PPLs would have to be recruited over the 4-year period, giving a total of 4,600 PPLs. As this compares favorably with the number successfully recruited and assimilated in the extension service, and as

accredited agricultural high schools are increasing their output of graduates with PPL qualifications, these staffing targets are achievable. A total of 200 Animal Health Officers would also be recruited to operate the new animal health posts to be constructed under NAEP III.

4.06 The overall PPL/PPS ratio adopted in NAEP II was 25 to 1. However, due to greater emphasis on the estate crop, livestock, and fishery subsectors, GOI has estimated an ultimate requirement of commodity/discipline-specialized PPSs to be 352 for food crops, 260 for estate crops, 892 for livestock, and 611 for fisheries, or a total of 2,115 by 1989. For transmigration areas, an additional 57 PPSs would be required based on 1 PPS for 7,500 transmigration families. However, to be consistent with the number of PPLs to be recruited under this project and at the same time to provide sufficient commodity/discipline-specialized PPSs in all the subsectors, the target for additional PPSs under this project has been fixed at 600. Most of the PPSs would be based in provinces where the respective activities predominate.

4.07 Recruitment of qualified university agricultural graduates to fill PPS positions, particularly in the more remote regions of the Outer Islands, would be somewhat more difficult than recruitment of lower level staff, although, again, the earlier projects have for the most part met their PPS staffing targets on schedule.

Construction Program

4.08 Rural Extension Centers serve as the home base of the field extension workers (PPLs and PPUPs), as their offices, the site of their regular (usually biweekly) training and briefing by PPSs, occasional farmer courses and meetings, simple agricultural field trials, and as storehouses for their equipment. Under NAEP II, RECs in the 26 project provinces were 130 m² in area, located in predominantly food crop producing areas with some in transmigration areas, and included a house for 1 PPUP and site development (fencing, access road). Under NAEP II, a total of 1,402 RECs have been built. Given a ratio of 1 REC for 15,000-20,000 farm families in Java and Bali and 1 REC for about 8,000 farm families in the Outer Islands, about 2,000 RECs would be required in 1991. In a survey recently conducted by AAETE, the number of existing RECs was ascertained to be 1,255 and the requirement of new RECs was determined to be 894. In view of available recurrent cost funds for their operation, AAETE has planned for 230 RECs (outside Java and Bali) under the proposed project. A committee from FKPP-I would decide the general location of the RECs in each province so that RECs can serve as many subsectors as possible and that their areas of operation do not overlap with other existing facilities. In this context, special attention should be given to the location of estate crop centers (UPPs) set up by DGE, as after the period of intensive tree crop development, they will become available for use as RECs. The same committee would also decide the general location of 200 animal health posts, taking into consideration other installations such as existing and proposed plant protection centers for food crops and estate crops. During project reformulation, it was agreed that once the location committee determined the general locations, the specific site of each REC and each AHP for the subsequent year (satisfactory to the Bank) would be included in the annual operating plan to be submitted to the PIU by August 31 each year (Para. 4.27).

4.09 The 230 new RECs would be 168 m² each, comprising 96 m² for the main building which includes a meeting room, Chief's room, room for PPUPs and secretariat, library, storage room, toilet, and generator room; and 36 m² each for 2 houses for PPUPs. All RECs previously constructed under NAEP II would be expanded by 48 m² and would include 1 house of 36 m² for the REC Chief, and additional PPUP work space up to 12 m². The REC construction schedule is described in detail in Annex 3, Table 5.

4.10 Two hundred and ten houses of 36 m² each would be constructed in Irian Jaya and East Timor for PPLs because of the difficulty in obtaining suitable houses in these 2 remote provinces (69 houses will be built in Irian Jaya, 141 in East Timor). PPL houses in Irian Jaya will be concentrated in border and transmigration regions.

Vehicles and Equipment

4.11 Transport is one of the most important inputs to the training and visit system, as it provides the mobility required to meet the demanding schedule of PPL field visits, field supervision, and assistance by managers and PPSs, and the biweekly training sessions of PPLs by PPSs. Motorcycles (3,828) for the movement of PPUPs and PPLs and 64 four-wheel-drive vehicles would be provided to the head of the Extension, Education, and Training Division or the division responsible for extension, education, and training in the KANWIL office (sub-PIU manager), provincial BIMAS Secretary, and PIU. All vehicles would be operated under a pool arrangement. Forty-five animal health mobile units for all provinces and 16 audiovisual mobile units for 11 provinces would be provided. All other provinces have received mobile units for food crops under the earlier two Bank-assisted projects. Initially, 5 AH mobile units would be bought in 1987/88, and an evaluation of their performance and cost-effectiveness would be made before deciding on purchase of the remaining 40 in 1989/90. A condition of purchasing the 16 audiovisual mobile units would be a similar evaluation of the performance of all the existing ones.

4.12 Equipment and furniture would be provided under the project to all 230 new RECs. The basic REC equipment package, largely similar to that provided under the NAEP II (Annex 2, Table 5), consists of the minimum required office and field equipment necessary for field extension work. Some inexpensive training materials and aids and portable instruments would be provided in quantities sufficient to supply most PPLs, so that they could demonstrate the instruments' use to farmers. In addition, specialized extension packages (323 units) useful for extension in food crop, estate crop, livestock, and fisheries subsectors would be provided to RECs to be built in areas where those activities predominate (Annex 2, Tables 5, pages 3-7). These packages have been designed to include only the simplest tools or equipment to avoid transforming RECs into specialized demonstration farms incapable of replication by most smallholders; the contents of each specialized package would relate to the major crops grown in that REC area. Furniture and basic equipment would be supplied to the 200 new animal health posts. Additional furniture would be procured for provincial level BIMAS offices (27 units) and sub-PIU (27 units), as well as 35 computers for the Agricultural Information Centers, and added equipment for PIU Headquarters.

Extension Materials

4.13 Under the Agricultural Research and Extension Project (Loan 1179-IND), a national Agricultural Information Center (AIC) was established at Ciawi and 11 AICs in 11 provinces under AAETE. Another 15 AICs are being established in the remaining 15 provinces under AAETE with funds provided by the Third Agricultural Training Project (Loan 2341-IND). These AICs are equipped with printing machines to produce leaflets and brochures, movie cameras to generate films, cameras to produce slides, facilities to duplicate cassettes, and so forth. The AICs also have a group of personnel specialized in certain disciplines and trained in producing extension materials. Most common types of extension material can be turned out by the AICs. Any special extension material should be written jointly by the Directorates of Extension and representatives of AARD and finally produced by AICs. Funds will be provided to cover the cost of the raw materials needed by the AICs for production of these extension materials. The materials required are for: 30 film titles, 871 film copies, the transfer of 45 film titles to video, 1,050 video copies, 1,092,000 copies of brochures, 60,000 copies of agricultural magazines, 100,000 copies of flip charts, 450,000 copies of bulletins, 84 sound slides with 12,600 copies, 320,000 folders, and 10,000 copies of farm budgeting handbooks.

4.14 All RECs are supplied with slide projectors and cassette recorders, and all provincial food crop extension divisions and 10 provincial estate crop divisions have mobile extension units capable of presenting moving pictures. Since agricultural and linguistic patterns vary widely across Indonesia, the production, dubbing, and distribution of film materials would require careful planning. Under the reformulated project it is envisaged that the majority of films and videos would be produced in provinces, and fewer procured nationally. Quantities of extension materials and their justification would be included in the Annual Operating Plan (Para 4.27).

Trials and Demonstrations

4.15 Based on the recommendations of the Study Team of Agricultural Extension Organization and Management, local verification trials should be conducted regularly by PPSs under various agro-ecological conditions, after close liaison with AARD staff and production divisions of the Dinas at the province. The trials are aimed at verifying appropriate recommendations for demonstrations. Data collected will be analyzed, formulated, and the approved results published in newsletter and bulletin form by the AICs. The implementation plan and cost of the 4,500 trials are presented in Annex 3, Table 7.

4.16 Demonstration activities should be in accordance with the demonstration pattern applied in the agricultural sector and directed at introducing new technology and developing cooperation within and between farmer groups. Held on individual or group farmer fields (13,500 plots, 6,000 farms, in 3,000 demonstration areas), the demonstrations will be run by PPLs, PPUPs, and PPSs in cooperation with the farmers and Dinas staff.

Training

4.17 Essentially, four types of staff and farmer training would be undertaken by the project. The first is the continual, routine biweekly (or

as frequently as may be necessary for the different subsectors) training or briefing of PPLs by PPSs in the RECs on impact points to be communicated to the farmer groups during the cycle of visits. The second type of training consists of periodic operational reviews and preparation sessions by field staff and supervisors (Paras. 4.18-4.19). The third is the special training for key farmers and for staff to introduce them to new job responsibilities and work methods, and to new technical subject matter fields (Para. 4.20). The fourth consists of degree or certificate courses both in-country and overseas, and study tours abroad for selected staff (Para. 4.21). A total of 82,816 extension workers and staff will receive training, as will 55,450 key farmers (including 20,000 estate - coffee, rubber, coconut - farmers). In general formal staff training conducted at ISTC's will be the responsibility of the ISTC Director, while key farmer training at the REC will be the responsibility of each dinas following the agreed program to be drawn up in FKPP I.

4.18 Periodic Review Sessions. PPSs and provincial and district extension managers would take part in one or two 2-3 day sessions per year to be held at provincial level before each main sowing/planting/stocking season. With the assistance of local university and research staff, experts from AARD, consultants, and senior project staff, these meetings would determine and agree on detailed technical recommendations for individual crops and farming systems in the light of prevailing socioeconomic conditions in the various agricultural regions of the province. The scheduling of these recommendations in the overall training and visit cycle would also be reviewed. The most important function of these sessions is to provide better recommendations through strengthened research/extension linkage. The researchers would train the PPSs on the latest findings of research relevant to the commodities in the farm systems in their areas, while the PPSs would apprise the researchers of the farmers' problems. Following these sessions, similar sessions would be held at the district level for the PPLs and PPUPs to provide them with the background required to understand the applied REC training they will receive during the next season.

4.19 Each PPS would attend a 1-2 day review session once a month (or as frequently as may be necessary for different subsectors) at provincial headquarters to be organized by the KAKANWIL, the PPS Coordinator, and the Head of the Extension, Education, and Training Division, during which progress would be reviewed and the REC training program for the next month planned and prepared. More specialist courses would be arranged for PPSs at regional or national level, and occasional workshops (2 or 3 times a year) would be held at regional (groups of 2 to 4 provinces) or provincial level, often at research stations.

4.20 Special Training Courses. All newly recruited PPLs, PPUPs, and PPSs would attend an orientation course concentrated on the training and visit system and communication techniques, to be held at in-service training centers (ISTCs). The ISTCs have been strengthened by three Bank-assisted projects and have sufficient capacity (Annex 2, Table 6b). Short specific skill courses of fewer than 14 days' duration for the extension staff (Annex 2, Table 6a) would be organized by the ISTCs in cooperation with respective provincial agricultural services. Contact farmers, women farmers, and young farmers would attend short courses of 3-7 days' duration to be organized by provincial agricultural services, so that they can comprehend and apply new agro-technologies, including methods of storing and using agricultural products and seeds, utilization of home gardens, water management, soil

conservation, cattle breeding, and fisheries (Annex 2, Table 6). In each province the overall training program would be planned by the Head of the Extension, Education, and Training Division of the KANWIL and the PPS Coordinator in conjunction with the Head of ISTC, BIP, and the four Kepala Dinas. It would be approved by FKPP-I. Orientation courses will also be organized to brief administrators and staff of other Ministries or agencies concerned with rural development on the philosophy, approach, and structure of the national agricultural extension program.

4.21 Fellowships and Courses. Long-term fellowships of 1-3.5 years' duration leading to Diploma, Masters, and Ph.D. degrees in extension education, home economics, agribusiness, production, and post-harvest technology would be provided to qualified PPL, PPUP, and PPS and district, provincial, and central extension staff. Overseas training would consist of 8 Ph.D.s, 44 M.Sc.s, and 100 short-term training courses of 3 months' duration for PPS and extension officers at district, provincial, and national levels. In-country training would consist of 8 Ph.D.s, 115 M.Sc.s, 900 Diploma III courses of 3 years' duration, 700 Diploma I courses of 1 year's duration, and 150 Diploma IV courses also of 1 year's duration. The purpose of this program would be to upgrade the overall technical capability of the cadre of extension staff, increasing its capacity to assimilate the flow of research results from foreign, national, and local research institutions and to utilize them in refining field extension recommendations. Assurances were obtained from GOI during negotiations that an annual long-term training program, satisfactory to the Bank, would be submitted to the Bank by December 31 of each year, beginning December 31, 1987.

Operational Support and Supervision

4.22 The project would provide funds for the operation of the national, provincial, and district extension forums, and for the national PIU and sub-PIUs at provincial level. It would also provide specific funds for each Dinas at provincial and district level to carry out their technical support and supervisory functions. Considerable emphasis will be spent on supervision because experience of the training and visit system has shown that the PPLs and PPUPs who are well trained and backed up by PPS and their District level administrators (from BIMAS and the Dinas) are far more effective than those who are left much to their own devices.

Studies

4.23 The project would provide funds for carrying out the following studies, which will be conducted by the Bureau of Agricultural Extension within AAETE in conjunction with the four Directorates General. The outputs of these studies would be used by the Directorates of Extension in each Directorate General to improve the strategy and guidelines of extension in supporting respective commodity production programs:

- (a) Study and evaluation of the T & V system (in relation to production development approaches, farmers' socioeconomic conditions and needs, research/extension linkage, and management system), and of selected extension methods;

- (b) Study and evaluation of the strategy for developing participation of farmers, fishermen, women, and youth in agricultural development through their farmer groups;
- (c) Study and evaluation of the use of media and distance learning, and evaluation of the cost-effectiveness of different extension and training methodologies. This would include evaluation of the new training methodologies using a farmer needs and staff competency based approach refined in the recent NAEP II financed study with the assistance of UNDP/DTCP staff.

Technical Assistance

4.24 Consultant technical assistance in direct support of project implementation would fall into three categories: long-term advisory service to project management; short-term technical assistance to Directors of Extension in reviewing and revising extension recommendations for the entire range of smallholder agricultural activities to be eventually covered by the extension system; and local consultants for engineering design and supervision of project civil works. The first category would consist of 1 extension advisor (24 man-months) to assist the Project Director and Director of the Bureau of Agricultural Extension in extension methodology and communication; 1 consultant in monitoring and evaluation (12 man-months); and 1 in rural sociology (12 man-months) to assist the Project Director and Director of the Bureau of Agricultural Extension. Assurances were obtained from GOI that they would employ consultants for the long-term technical assistance not later than September 30, 1988. It is currently envisaged that such assistance would be provided by a bilateral donor.

4.25 The short-term technical agricultural consultants (15 man-months) would work with the Directors of Extension, and would be responsible for reviewing in detail the conditions of smallholder production in all major commodity fields in the important agricultural regions of Indonesia, assessing the relevance of domestic and foreign research results for upgrading field practices of smallholders in various regions, and on this basis would help prepare practical extension recommendations to be delivered by the extension workers.

C. Implementation Schedule

4.26 Project implementation would cover a period of about four years from April 1987 to March 1991. The sites for the first year's construction program were selected prior to loan negotiations by the special committee for this purpose. PPLs, PPUPs, and PPSs are scheduled to be recruited starting in the second year at an annual rate of about 1,150 PPLs, 380 PPUPs, and 150-200 PPSs. Furniture and equipment would be procured during the first, second, and third years; motorcycles would be purchased during the second, third, and fourth years. The in-service training program would coincide with the recruitment program. Diploma, Masters, and Doctorate courses would commence from the first year so that they could be completed within the life of the project. An implementation schedule is shown in Annex 3, Tables 4-7.

4.27 A draft annual operation plan (AOP) would be prepared, under the overall direction of the Head of the Extension, Education, and Training Division in the KANWIL office, agreed to by FKPP-I, and submitted to PIU for review and to NCAE for approval. This plan would contain the sites selected for the new RECs and AHPs and their justification, the training program, the production of extension material, the verification trial and demonstration program and the operation and maintenance expenditures to be covered by the project, all of which shall be satisfactory to the Bank. In accordance with existing directives, the extension program elements of this plan would be built up from REC level, which includes heavy emphasis on review of the previous season's impact points in consultation with farmer leaders from a number of farmer groups. These proposals should be submitted to PIU not later than August 31, 1988, for FY90 and August 31, 1989, for FY91. For FY89 the proposals should be submitted to PIU by the end of February 1988. Each year, the PIU will submit the AOP to the Bank by November 1, commencing November 1988.

V. PROJECT COST AND FINANCING

A. Cost Estimates

5.01 The total estimated project cost is US\$100 million equivalent, of which US\$13.0 million (13%) would be foreign exchange (Table 5.1). Base costs are expressed in May 1987 prices and include value-added tax and other taxes and duties. Project costs by item of expenditure are provided in Annex 2, Table 1.

Table 5.1: Project Cost Summary

	<u>Rupiah billion</u>			<u>US\$ million</u>			<u>% Foreign Exchange</u>	<u>% Basic Cost</u>
	<u>Local</u>	<u>Exchange</u>	<u>Total</u>	<u>Local</u>	<u>Exchange</u>	<u>Total</u>		
Civil Works	14.4	4.6	19.0	8.8	2.8	11.6	24	13.6
Vehicles	4.4	4.4	8.8	2.7	2.7	5.4	50	6.3
Furniture & equip.	3.1	1.5	4.6	1.9	0.9	2.8	40	3.3
Extension material	5.0	0.3	5.3	3.0	0.2	3.2	5	3.6
Training	31.8	4.2	36.0	19.4	2.6	22.0	15	25.8
T.A. and studies	0.8	0.9	1.7	0.5	0.6	1.1	6	1.3
Incremental operational cost	52.9	2.1	55.0	32.2	1.3	33.5	4	39.3
Land acquisition	9.5	-	9.5	5.8	-	5.8	-	6.8
Subtotal base cost	<u>121.9</u>	<u>18.0</u>	<u>139.9</u>	<u>74.3</u>	<u>11.1</u>	<u>85.4</u>	<u>14</u>	<u>100.0</u>
Contingencies:								
Physical	7.4	1.1	8.5	4.5	0.7	5.2	14	6.1
Price	13.4	2.0	15.4	8.2	1.3	9.4	14	11.0
Total project cost /a	<u>142.8</u>	<u>21.1</u>	<u>163.9</u>	<u>87.0</u>	<u>13.0</u>	<u>100.0</u>	<u>14</u>	<u>117.1</u>

/a Including VAT and other taxes and duties.

5.02 Construction cost estimates are based upon updated standard costs supplied by BAPPENAS and the Ministry of Finance and updated Cipta Karya data, estimated May 1986 level per m² for the lowest (Grade C) category of offices. Prices have been weighted considering the differences in the various averages, based on available data from BAPPENAS, the Ministry of Finance, and Cipta Karya. Cost estimates for equipment and furniture are based upon recent contracts for identical items purchased under NAEP II, with a 10% increase allowing for estimated price last year in 1986/87. Unit costs for local training programs are computed from detailed budgets for training courses prepared by AAETE, while costs for overseas courses are based upon recent experience under NAEP II and other Bank Group financed projects in Indonesia. Salaries and allowances for the Project Implementation Unit and incremental field staff are derived from current scales under NAEP II which provide a graduated structure according to the years of employment of the field staff. Other operational expenses are based on recent experience under NAEP II allowing for estimated price increases in 1987/88. Cost estimates include physical contingencies at 10% of all costs except incremental field staff salaries and allowances. Price contingencies are indicated in Table 5.2 and equal 20% of base costs.

Table 5.2: Expected Price Increases (%)

Calendar Year	1987	1988	1989+
Local	10.0	5.0	3.5
Foreign	3.0	1.0	1.0

B. Financing Plan

5.03 The proposed Bank loan of US\$55.0 million equivalent would cover 55% of the project cost including the estimated cost of vehicles (about US\$5.1 million) and taxes and duties. The Government of Indonesia would provide annual budget appropriations to cover expenditures estimated at Rp 73.8 billion (US\$45.0 million). The loan would finance US\$13.0 million of foreign costs (100%) and US\$42.0 million (48%) of local costs. GOI will attempt to secure bilateral assistance for the proposed Technical Assistance; if this does not prove possible it will be provided under the loan and is included in the above figures.

C. Procurement

5.04 Civil Works. Procurement arrangements are shown in Table 5.3. Nearly all project civil works (US\$11.6 million) would consist of the construction or upgrading of small rural installations and houses, representing an expenditure of about US\$6-24,000 at any location. These works would be carried out following local competitive bidding (LCB), with contract packages generally encompassing entire provincial or district construction programs. On this basis, contracts for works would be less than Rp 500 million in size. As these works are scattered over 27 provinces and are to be implemented over 3 years, it would be difficult to combine them into large

contracts suitable for international competitive bidding (ICB). There are numerous local contractors capable of executing the required works. The engineering firms, licensed by D.G. Cipta Karya, would be responsible for site surveys, preparation of tender documents and contracts, and supervision of construction at a cost of 7% of the value of civil works. Tender and contract documents for civil works would be in the same format as in NAEP II. Land purchase (US\$5.8 million) would be carried out according to standard government procedure.

Table 5.3: Procurement Arrangements /a
(US\$ million)

Component	ICB	LCB	Other	N.A.	Total
Civil Works		11.6 (10.4)			11.6 (10.4)
Vehicles	5.4 (5.1)				5.4 (5.1)
Furniture & Equipment		2.8 (2.3)			2.8 (2.3)
Extension material				3.2 (2.6)	3.2 (2.6)
Training			22.0 (22.0)		22.0 (22.0)
Technical assistance and studies			0.6 (0.6)	0.5 (0.5)	1.1 (1.1)
Incremental cost				33.5 (4.1)	33.5 (4.1)
Land acquisition				5.8	5.8
Total	5.4 (5.1)	14.4 (12.7)	22.6 (22.6)	43.0 (7.2)	85.4 (47.6)

/a Costs including VAT and other taxes, excluding physical and price contingencies. Figures in parentheses () are Bank Loan amounts.

5.05 Vehicles, Furniture, and Equipment. Vehicles (US\$5.4 million) would be procured under ICB in accordance with Bank Group guidelines, and would be grouped in contract packages large enough to attract international competition. A preference limited to 15% of the c.i.f. price of imported goods, or the custom duty, whichever is lower, would be extended to local manufacturers of such items in the evaluation of bids. All contracts for vehicles, equipment, and materials exceeding US\$200,000 in value would be submitted to the Bank Group for review before being awarded. Furniture (US\$1.2 million) would be procured through (LCB) procedures as it would be purchased in small lots for the RECs spread over 27 provinces, and therefore

be an unattractive option for international bidders. Office and technical equipment (US\$1.8 million) would be procured under LCB in accordance with GOI regulation, while extension materials would be produced by force account.

5.06 Services. Overseas short-term and long-term courses (US\$2.9 million) will be administered by the PIU and conducted in selected countries and universities. The average cost assumed per student for studies abroad are US\$50,000 for Ph.D., US\$35,000 for a M.Sc., and US\$9,000 for a short course of 3 months' duration. The domestic basic trainings for PPLs, PPUPs, and PPSs would be carried out by AAETE at the ISTCs according to a training program reviewed and agreed upon by the Bank (US\$2.3 million). Contracts for engineering design and supervision, technical assistance, and studies (US\$0.6 million) would be awarded on the basis of Bank Guidelines on the Use of Consultants. Studies would be carried out by AAETE (US\$0.5 million). Routine expenditures totaling US\$31.0 million are also included in project costs. It is however anticipated that technical assistance would be provided on a grant basis by a bilateral donor.

5.07 Plans for the production of extension material, skill training for PPLs, PPUPs, and farmers, and establishment of trials and demonstration fields or areas would be approved and coordinated at the provincial level by KANWIL/FKPP-I and would be implemented by the appropriate agencies as agreed in the annual operation plan. Extension materials would be produced by AAETE at their national and provincial AICS.

D. Disbursement

5.08 The proposed allocation of loan proceeds is shown in Annex 3, Table 1. The loan would be disbursed at the following rates: 90% of the cost of construction and site development including VAT; 100% of the cost of training, technical assistance, and studies; 100% of the foreign exchange cost of directly imported equipment and goods; 65% of the total cost of locally procured imported equipment and goods; and 95% of the ex-factory cost of locally manufactured equipment and goods. The Bank would also disburse against the costs for extension materials, demonstrations, trials, and operational costs which include coordination and supervision costs, and cost for extension material production. For these expenditures the loan would be disbursed at 100% for GOI's FY87/88 and FY88/89, at 75% for FY89/90, and at 50% for FY90/91 and thereafter.

5.09 Disbursement would be made on the basis of Statement of Expenditures (SOEs) for local training, extension material production, and operational expenses, and for equipment and furniture purchases under US\$50,000 (contract value); all other disbursement would require full documentation. Detailed documentation for SOEs would be retained in Indonesia and made available to the Bank for supervision. Minimum size of reimbursement application should be around US\$100,000 equivalent. Minimum size of letter of credit for goods to be disbursed under agreements to reimburse should be US\$10,000 equivalent. The Bank would not disburse against land purchase, salaries for the existing staff, and maintenance expenditures for the existing RECs.

5.10 An estimated schedule of disbursement is shown in Annex 3, Table 3. Disbursements are projected over a four-and-one-half year period from FY87 to FY91. The loan closing date would be December 31, 1991.

E. Flow of Funds, Accounts, and Audits

5.11 Assurances were obtained during negotiations that (a) separate accounts would be maintained for the project; (b) these accounts and the statement of expenditures would be audited annually by an independent auditor acceptable to the Bank; and (c) these audited accounts and the audit report would be submitted to the Bank within nine months of the close of each GOI fiscal year.

5.12 The funds for the activities that are to be carried out by, and are the responsibility of, the national level agencies would be allocated and included in the respective agency budget, in other words, BIMAS and the Directorates General, whereas the funds for land purchase would be the responsibility of the local governments. The funds for other activities under the project would be allocated in AAETE's DIP, that is, PIU-NAEP Pusat, which would also include funds for the operation and management of the PIU office.

5.13 The project funds at province and Kabupaten levels would be managed by the Authorized Representative of the Project Director (Kuasa Pimprio) and a Treasurer (BPUMC), appointed by the Minister of Agriculture and assisted by authorized financial staff (PUMK) appointed by the PIU Director. Procedures for project administration and the flow of funds would follow the guidelines for Financial Administration and Guidelines for Material Administration (Pedoman Administrasi Keuangan = PAK; Pedoman Administrasi Material = PAM) issued by the Ministry of Agriculture.

5.14 Withdrawal applications for the loan funds would be prepared by PIU Pusat and submitted to the Bank through Bank Indonesia.

VI. PROJECT IMPLEMENTATION, ORGANIZATION, AND MANAGEMENT

A. Reorganization of the Agricultural Extension Service

6.01 The agricultural extension service has been recently reorganized on the basis of Presidential Decrees No. 24/1983, 62/1983, Ministerial Circular of January 25, 1985, and Ministerial Decrees No. 143 of March 11, 1985, and 482 of July 3, 1985 and the Joint Decree of the Minister of Home Affairs (No. 59/1986) and the Minister of Agriculture (No. 675/Kpts/LP.120/11/1986). These decrees establish and strengthen the unified extension service. GOI accepts the Bank's position that the relative responsibilities of the BIMAS Secretary and the Head of the Extension, Training and Education Division in the Kanwils office would be clearly spelt out, and that this is unambiguous to them both and all those concerned with agriculture development in the province. The instruction will make clear that this division of responsibility the BIMAS Secretary will be primarily responsible for implementation and coordination of GOI's intensification program, and the Head of the Extension, Training and Education Division for the conduct of provincial extension programs. A condition of project reformulation is that an Instruction Letter of MOA will be issued before February 29, 1983 which will set out the changes in responsibilities under the revised organisational structure agreed during reformulation and clarify the existing guidelines.

6.02 Coordination. The coordination of agricultural extension at the national level is being carried out by the National Commission for Agricultural Extension (NCAE) comprising the Director General of AAETE as Chairman; the Secretary of BIMAS as Vice Chairman; the Director of the Bureau of Extension, AAETE, as Secretary; the Directors of Extension and other Directors within the Ministry of Agriculture closely linked with agricultural extension (including Directors of AARD Research Coordinating Centers for Food Crops, Horticultural Crops, Industrial Crops, Fisheries, and Animal Sciences) as members. The provincial coordination forum at present comprises the KAKANWIL as Chairman, the Secretary of BIMAS Daily Guidance Unit as Secretary, and the heads of provincial agricultural services and chiefs of technical units and other institutions closely linked to agricultural extension as members. As the Head of Extension, Education, and Training Division in the KANWIL Office now has the responsibility of coordinating all extension activities in the province, he will assume the duties of the BIMAS Secretary for the day-to-day management of extension activities in the province; and he will be appointed Co-Chairman of the Tim Kerja (working group) for FKPP I and in practice will normally chair its meetings. The proposed new MOA instruction clarifying the new procedure will make clear the division of responsibility between the BIMAS Secretary, who will concentrate his attention on the implementation of GOI's intensification programs, and the Head of the Agricultural Education, Training and Extension Division, who will concentrate his attention on the implementation of overall extension programs acting in effect as Provincial Extension Officer. The district coordination forum comprises the head of one of the subsectors designated by Bupati (district administrative head) as Chairman, the Secretary of BIMAS District Executive Unit as Secretary, and the heads of the other subsectors and institutions closely related to agricultural extension as members. Each of the three coordination committees is being assisted by a working group to carry out daily duties under the direction of its Chairman. At the national level this is chaired by the Director of the Extension Bureau, AAETE; at the province, by the Head of the Extension, Education, and Training Division in the KANWIL office (as official Co-Chairman with the BIMAS Secretary); and the district level, by the Secretary of the BIMAS District Executive Unit. At the REC level, the coordination committee would consist of the Chief of REC, the PPUPs and PPLs based at the REC, and the farmer leader representatives.

6.03 This coordination will be further strengthened by a single line of command for overseeing effective extension delivery at the provincial level. The Head of the Extension, Education, and Training Division or the head of the division handling extension, education, and training in the KANWIL office will be responsible for overseeing and reporting to the FKPP-I on the implementation of all decisions reached on conducting the extension program, under the overall direction of the KAKANWIL. At the district level, the Secretary of the BIMAS District Executive Unit will carry out the same role vis-a-vis the FKPP-II, under the overall direction of the Head of BIMAS District Executive Consultative Unit, who is designated as a Chairman of FKPP-II. As discussed in Para. 2.11, the new structure should be kept under close review, particularly at the district level. GOI would give an assurance to further review the organizational structure with IBRD staff in mid-1989; NCAE would review and implement the agreed recommendations, which would be embodied in any necessary amendment to the Ministerial Decrees of 1985.

6.04 The main tasks of the NCAE, which meets once a month, are: (a) to coordinate formulation of national policies and strategies for agricultural extension; (b) to coordinate preparation of the national agricultural extension program; and (c) to coordinate, review, and strengthen research/extension linkages. The functions of the FKPP-I and II are to: (a) translate the national agricultural extension policies and strategies into provincial and district operational programs according to regional needs; and (b) coordinate management of agricultural extension activities in the region in accordance with the program of the forums. The functions of the REC committee are to: (a) formulate the agricultural extension program of all subsectors in the REC area through a cooperative planning exercise with contact farmers, and draw up a work schedule for each PPL; (b) monitor and supervise the implementation of agricultural extension activities in the REC area; (c) coordinate regular training of PPLs at the RECs and visits by PPLs to farmer groups; and (d) prepare or obtain and distribute agricultural information.

6.05 Administration of Extension Staff. Administration of the agricultural extension service within the Ministry of Agriculture (MOA) now devolves on BIMAS organization. This includes appointment, placement, salary assignment, salary increase, promotion, transfer and retirement of extension personnel, and operational expenses. In administering extension personnel, the Secretary of BIMAS Directing Board would consider: (a) extension policy as outlined by the Director General of AAETE; (b) the agricultural development program of the Directors General within MOA; and (c) existing laws and regulations on personnel affairs. The handover of the extension personnel whose administration was being managed by the DGs and AAETE to the Secretariat of BIMAS was completed by March 31, 1986.

6.06 Control over and Responsibility of RECs. The RECs constructed by the DGFCFA which have not been turned over to the regional government would be managed by the Secretary of BIMAS District Executive Unit. Assurances were obtained from GOI during negotiations that necessary funding for operation and maintenance of RECs (approximately Rp 3.6 million per REC) would be made to BIMAS. According to Ministerial decree, the Secretary of BIMAS District Executive Unit would appoint for each REC (a) one REC Chief; and (b) according to need, no more than five PPUPs, each assigned to organize, develop, and control the execution of the agricultural extension program in (i) agricultural resources, (ii) food crops, (iii) estate crops, (iv) animal husbandry, and (v) fisheries. Depending on the situation and condition, two or more subsectors may be managed by one PPUP. Just as subsector staff at the provincial level are under the administrative control of the Governor while technical control is retained by the four DGs at the national level, the administrative control over PPUPs and PPLs is under the Secretary of BIMAS District Executive Unit through the REC Chief, while technical control is retained by the subsectors at the district, province, and national level. One PPUP in each REC has been designated as REC Chief. Each REC Chief is responsible for carrying out the agreed extension program to the Secretary of BIMAS District Executive Unit.

B. Organization for Project Implementation

6.07 PIU. At the national level, the project is implemented by the project implementation unit (PIU) under the Agency for Agricultural Education, Training, and Extension (AAETE). The key positions such as Project Director, Project Secretary, Treasurer, Assistant to the Project Director, Programming Officer, Civil Works Officer, Equipment and Extension Material Officer, Financial Officer, and Training Officer have been filled on a full-time basis for the proper implementation of the project. PIU will be running the project based on the guidelines issued by NCAE. The activities at the national level will be: (a) recruitment of PPSs, PPUPs, and PPLs to be done by BIMAS; (b) national level training to be conducted at Ciawi Training Center and Diklat AUP; (c) the procurement of extension and training materials, vehicles, and equipment; (d) studies; and (e) supervision to be done by the Directorates of Extension under the DGs, BIMAS, AAETE, and NAEP (PIU).

6.08 Sub-PIU. Each province throughout Indonesia will have a sub-PIU at the KANWIL office. The Head of the Extension, Education, and Training Division or the head of the division responsible for extension, education, and training in the KANWIL office will be a sub-project manager (Kuasa Pimpro) who reports to the NAEP Project Director. Therefore, the funds for the project activities will flow through that office to each participating agency in each province. To run the task, the sub-project manager is assisted by the PUMC (regional assistant treasurer). The sub-PIU manager coordinates project implementation and supervision and is responsible for monitoring and evaluating project activities, for which he reports to the NAEP Director. He is also responsible for the overall coordination of extension programs in the province and accordingly reports to the KAKANWIL. Project implementation at the provincial level will occur as follows: (a) civil works and procurement of furniture and equipment would be implemented by the Head of the Extension, Education, and Training Division; (b) the training program would be implemented by ISTC in conjunction with Dinas staff; (c) production of extension materials would be implemented by AICs; and (d) technical support and supervision would be done by each Kepala Dinas, with coordination of the program by the Head of the Extension, Education, and Training Division.

6.09 Reorientation. A major national seminar will be held in March 1988 to train all Kuasa Pimpros and their treasurers in their duties under the revised project. It is also agreed that each Province would where necessary appoint as Kuasa Pimpro their most experienced and capable extensionist, who has good leadership qualities. This one week national seminar would be followed by 2 day seminars at regional level (groups of 2 to 4 provinces) during April, May, and June to which all key members of FKPP I, research and university staff would be invited for discussion on the proposed revitalised extension system.

C. Extension Methodology

6.10 The basic principles of the training and visit system of agricultural extension are by now well understood widely in Indonesia, both in theory and in concept, for implementation in the field. NFCEP and NAEP II management have been quite effective in communicating those principles to the provincial agricultural staff, predominantly to Food Crop Staff in irrigated rice production areas. However, this task would be made more difficult in the

proposed project due both to the increased difficulty of communication in the upland, tidal swamp, transmigration, and coastal fisheries areas that are to be included in the program and to the involvement of PPLs and PPSs from all the subsectors. Training programs under the project would thus be increased in frequency, and would concentrate on teaching extension methodology, as well as the simple elements of technical background of other subsectors, to the PPLs of all subsectors. As far as possible, only one set of extension farmer groups will be formed in any locality served by one set of PPLs in a REC.

6.11 PPSs of the different subsectors would be responsible for introducing extension packages for their subsectors and for training, briefing, and backstopping the PPLs in their specialized subsectors. The Chief of the REC, with the help of the PPUPs, would prepare an integrated program of all four extension services for delivery to the farmers. The PPLs of different subsectors would work together to prepare a joint program for the individual farmers of the group, and initially the PPLs of all four subsectors (or as many as are present) would jointly visit the farmers to advise them on their individual needs. Given the long-term asset establishment and maintenance nature of nonfood crop activities, extension on such matters as construction of, water supply to, and fertilization of, fishponds; construction of chicken houses; and inoculation and breeding of cattle is not particularly time-bound and can be fitted into the slack periods of the seasonal crops. In many cases, extension recommendations for the various activities must be integrated to be relevant to actual farm-level decisions. This applies, for example, to intercropping (upland paddy under rubber or coconut trees), fish raising in paddy fields, rotation of estate crops (e.g., sugar) with food crops, or a mutually beneficial farming system involving animals (for manure and draft power) and forage crops. In many such areas, generalist PPLs, with guidance from PPSs of different subsectors, would be able to deliver simple extension messages for most of the commodities with which the farmers are concerned, calling on requisite specialist PPLs or PPSs when problems arise. However, for some estate crops such as rubber, coconut, and oil palm, for animal health, and for brackish water and marine fisheries, specialist PPLs may be needed depending on the nature of the job they would have to perform, as indicated in the following paragraphs.

6.12 Estate Crops. For rubber, coconut, and oil palm, the extension message would focus on cultivation methods, nursery techniques, weeding, processing, and marketing, with the ultimate aim of introducing the farmers to somewhat more sophisticated and financially viable packages. For tree crops, a major constraint to progress in the smallholder sector has been the nonavailability of high quality planting materials. However, this shortage of planting material could be alleviated through the harnessing of resources and capabilities of PTPs, PMUs, and even the private sector in the target areas. The provision of improved planting material would have to be accompanied by the requisite fertilizer, pesticides, equipment, credit, processing, and marketing. (For further details, see Project File Annex 6, Working Paper 1 -- Estate Crops).

6.13 Livestock. Increase in livestock output would largely come from extension of better nutrition and animal health services. While nutrition extension may be handled by generalist PPLs, animal health extension could be performed better by specialist PPLs. The project includes animal health

posts, mobile animal health clinics, and animal health officers (AHO) in addition to PPLs. The concept is to provide low cost delivery of basic animal health services through these posts, the AHOs, and the mobile animal health clinics. The AHOs and specialist PPLs would be trained to recognize the most common forms of major diseases such as Newcastle, hemorrhagic septicemia, and anthrax; to administer vaccines and advise on other treatments and procedures; and thereby to achieve a wide dispersion of the benefits that improved animal health can yield. Improvement in livestock production from better nutrition and animal health would make increased draft power available for increased crop production. (For further details, see Project File Annex 6, Working Paper 2 -- Livestock.)

6.14 Fisheries. Extension activities for brackish water fisheries would include pond engineering, shrimp hatchery development, shrimp culture development, and feed production technology. However, most development constraints are in the marine subsector. The average productivity of a small-scale marine fisherman is about 1.1 mt per year. To ensure the well-being of small-scale marine fishermen on a sustained basis, it may be necessary in some cases to regulate fishing methodologies in the coastal areas, and a special effort needs to be made to encourage the introduction of marine or brackish water aquaculture for underemployed marine fishermen. Fishery extension for small-scale marine fishing communities would include communicating improvements in post-harvest technology, in fisheries technology, in assistance to social welfare and community development programs, and in the management and operation of small-scale enterprises and organization. (For further details, see Project File Annex 6, Working Paper 3 -- Fisheries.)

D. Farmer Groups

6.15 Rural people have lived for centuries within strong communal groups or cooperatives (such as subak, gotong-royong, maphalus, etc.). These have clear membership ties, strong individual affiliation, and considerable power invested in the chosen leader, who commands much loyalty from the members. Principally, the traditional groups' agricultural activities (subak, maphalus) have a close parallel with the T & V system in that the groups hold regular meetings (every 35 days) to discuss field problems, to transfer government policy and technology, and to try and apply new technology. It has thus not been difficult to adapt them to form groups for agricultural extension purposes. Farmer group formation is generally based on whether field areas are contiguous (15-25 Ha/farmer group) rather than on whether the farmers are neighbors. Generally, each farmer group consists of approximately 100 farm families in irrigated areas, comprising one contact farmer and 20 progressive farmers from the upper layer. The demarcation of the area is decided by natural factors such as canals, roads, forests, or villages. Selection into groups emphasizes that the group has: (a) a similar purpose; (b) the same activities; and (c) easy communication with each other. The effectiveness of farmer groups depends upon the degree of interaction within the group. The task of the extension services is to continually motivate and maintain the social interaction among members and between the group and external institutions concerned with agricultural development. The farmer group was

the embryo of the Special Intensification (INSUS) Program which has been expanded to the entire country. Since the INSUS program started in 1979, the PPLs have had an important role in maintaining and supporting the communication of the group with other social institutions, guiding the farmer group, analyzing their farm management needs to get maximum profit, and practicing new technology in their own field. The growth and development of farmer groups depend upon the activity of the groups themselves as well as that of PPLs. Whereas farmers' attitudes were changing very slowly when based on an individual approach, change has come much faster with the approaches based on farmer groups. Special efforts would be made to widen decision making in farmer groups, and to assist resource-poor farmers, as discussed in Para. 2.08 above. A detailed proposal to develop special subgroups for resource poor farmers has been prepared and this would be reviewed by the NCAE for implementation under the reformulated project. The development of joint actions among farmer groups will not only focus on an increase in productivity but also on the dynamics of rural development.

6.16 Every year the GOI selects the best farmer group in the country for an award as an incentive to the growth and development of farmer groups. The competition encourages farmer involvement in the program, and raises its social status. Some farmer groups evolve into cooperative systems with a strong legal foundation and a more formal constitution, which strengthens not only their ability to procure inputs and to organize joint processing and grading of produce, but also marketing.

E. Role of Women and Youth

6.17 Women continue to play an important role in extension both as extension agents and as members of the target groups. About 15% of the PPLs engaged under NFCEP and NAEP II are women. The proposed project would provide support for training women in food crop production, food processing and cash-earning enterprises, and improved household management practices. Although the most direct communication by extension workers has been with the husbands, the women are reached indirectly through demonstration plots, leaflets, and film shows. On the whole, the extension system has been essentially neutral regarding the role of women in smallholder agriculture; however, efforts are underway to increase the direct impact of extension services on women. Women and youth subgroups are encouraged in all farmer groups, but they can also (depending on local social customs) participate in mixed groups. An effective extension approach must include the development not just of the farmer, but of the family as a unit.

F. Research/Extension Linkages

6.18 AARD is responsible for conducting research in the four subsectors, while each DG in the Ministry of Agriculture is responsible for recommending new technology in his subsector under the coordinating umbrella of AAETE. PPSs would maintain close liaison and receive training from research stations and would have responsibility for conducting location-specific verification trials of new technology that has been recommended by the DG and FKPPi before it is transferred to

PPLs. The analysis of verification trial results, demonstrations and farmer adoption of existing impact points would be built into the revised crop recommendations for each seasonal program, thereby ensuring that the recommendations become more location-specific and relevant to farmers' needs. The specialists at the AICs are responsible for preparing extension materials based on their contacts with research and university scientists and PPSs, under the overall direction of the Head of the Extension, Education, and Training Division in the KANWIL office assisted by the PPS Coordinator. Thus AICs produce printed, audiovisual, and related materials needed for PPLs/PPUPS and the farmers.

6.19 Research/extension linkage would be further strengthened under the proposed project through: (a) meetings once every two months of the Directors of Extension, Director of the Bureau of Agricultural Extension, and Directors of the AARD Central Research Institutes; (b) a semi-annual dialogue with the National Farmers' Representatives and master farmers by the Directors of Extension, Director of the Bureau of Agricultural Extension, Directors of the AARD Central Research Institutes, Heads of Bureaus of BIMAS, DG-AARD, DG-AAETE, and Secretary of BIMAS in accordance with the Minister's Decree; (c) more frequent, systematic, and effective meetings of research and extension specialists in the periodic review sessions; (d) an increase in the frequency of visits by PPSs to research institutes; (e) more verification and on-farm trials to be carried out by PPLs and PPSs under the supervision of research scientists; (f) more involvement of farmers in the identification of research problems and interpretation of research findings; and (g) quicker distribution of extension materials from AICs based on new recommendations resulting from on-farm trials and seasonal analysis of farmer adoption of impact points. Under the Agricultural Research Management Project being appraised by the Bank in 1988, the farming systems research program would be strengthened and placed under a national coordinator (already appointed in July 1987).

G. Monitoring and Evaluation

6.20 Monitoring of the project's physical and financial programs and the overall conduct of seasonal extension programs would be conducted by the sub-PIUs in the province under the guidance of the PIU. The sub-PIUs would also prepare half-yearly progress reports which would be reviewed by the PIU. Based on these semi-annual reports, the PIU would prepare semi-annual progress reports, as well as a project completion report within six months of the completion of the project for submission to the Bank. The existing M & E system would be reviewed and improved by the M & E consultant in conjunction with project and other MOA staff involved within 3 months of his arrival. He would then organize seminars and training courses to assure effective introduction of the improved system.

6.21 The Director of the Bureau of Agricultural Extension (BAE) of AAETE would be responsible for establishing and managing the project's evaluation system to enable evaluation of the overall success of the project. The Director of BAE would also evaluate achievements of each project component in relation to its objectives and, where feasible, estimation of quantified benefits. Funds have been provided in the project for several studies and

ongoing evaluations and for an expatriate expert on monitoring and evaluation. The main purpose of the evaluation and studies would be to make recommendations to project management on modifications or improvements to ongoing extension activities so that they may be better adapted to the needs and characteristics of the farmers.

6.22 In conjunction with the Planning Bureau of MOA and that of AAETE, the PIU would strengthen AAETE's existing capacity to monitor all major extension programs in the country to ensure that all advances in extension methodology and studies of extra cost-effectiveness are fully evaluated and their findings made known to all concerned in planning seasonal extension programs. These reports would be reviewed in the NCAE, and made available to FKPP-I staff. Annual seminars would be held to include MOA and donor agency staff to fully debate such study implications. Among the projects that would be included for review, in addition to NAEP III, would be:

- the USAID-financed Secondary Food Crops Development Project (SFCEP) with DGFCFA, which involves palawija crop production in E. Java, Lampung and S. Sulawesi, and which is based on improved farmer demonstrations, more use of the media, and better farm management advice and market intelligence;
- the proposed Bank-financed Tree Crop Human Resource Development Project, that complements NAEP III activities. This project will provide extension support to nucleus estate and special project farmer groups through UPP's, while NAEP III will assist all other smallholder estate crop farmers (classified by DGE as partially assisted) through the normal REC program;
- the FAO/UNDP Fisheries Development Support Project, which will strengthen DGF's development centers at Jepara (brackish water), Semarang (marine), and Sukabumi (freshwater) to develop more relevant technologies for field extension staff, and run training courses for PPS; and
- the IFAD/UNDP P4K Project, which provides special assistance to marginal farmers and landless.

6:23 From the full list of projects involved with extension (Annex 6 Table 2) it is clear that much could be gained from collaboration between these projects in strengthening the extension system. Improved methodologies would be developed and analysed under these projects to strengthen extension delivery especially for palawija crops, estate crops, livestock and fisheries; and they would work together in the FKPP forums to improve training of staff and farmers, and strengthen research extension linkages to improve the calibre of extension recommendations. Annual seminars of donor projects would be held to discuss experience and agree on activities that could usefully be reviewed by each project in the subsequent year.

VII. BENEFITS, JUSTIFICATION, AND RISKS

A. Production Targets and Extension Packages

7.01 Assessments have been made of the main constraints to smallholder production of the more important commodities, present average yields, agronomically feasible smallholder yields, and expected yields with extension, yields which are in each case taken at levels assumed to be far below what could be potentially achieved with intensive area- and commodity-specific development programs. These assessments are presented in working papers in the project file (Annex 6) and summarized in Annex 5, Table 1. In many cases, constraints are identified in areas outside the purview of the extension effort: for example, the development of new varieties by research, and improvements in marketing and credit arrangements and price policies. In most cases, however, yield increases profitable to the smallholder are possible with improved agricultural technique alone, even under present institutional arrangements and with the varieties currently available.

B. Benefit Estimation

7.02 An economic assessment of the proposed project is difficult for several reasons. First, its implementation and impact would be dispersed throughout 27 provinces of Indonesia, and across the entire range of smallholder agricultural activity. Second, other variables such as research results, availability of inputs, and attitudes and response of farmers affect the estimation of benefits in every area or subsector. Finally, it is theoretically and empirically difficult to isolate the effects of extension from those of research, improved inputs, weather trends, changes in relative prices and marketing systems, general improvements in education and access to mass media, and programs of investment in transport, agricultural, and irrigation infrastructure. The following economic analysis is therefore presented as a broad indicator of the economic rate of return for the project based on an identification of certain key parameters and conservative but reasonable values for these parameters. For this reason also, no attempt has been made to update this analysis for the revised project, as it is considered indicative of likely benefits.

7.03 Potential Incremental Yields. The assessment of the potential impact of the project was narrowed to a few selected commodities which would be emphasized in this project (and in the revised project) and which would be readily amenable to production increases through improved extension. These include the major food crops (rice, maize, cassava, groundnuts, soybean, oranges, and garlic); estate crops (rubber, coconut, coffee, cloves, pepper, sugar, tobacco, cotton); freshwater, brackish water, marine, and mariculture fisheries; and livestock (cattle, dairy cattle, poultry, ducks, sheep, and goats). For these commodities, a potential incremental yield was estimated based on the projected impact of extension alone (Annex 5, Table 1) assuming only relatively simple improvements in cultivation practices, minimum increase in purchased inputs, and no major on-farm investments. These assumed yield increments are far below both the genetic potential of improved varieties and increases attainable with more intensive specialized programs.

7.04 Farmer Participation. Farmer participation was projected on past experience and on a model of the actual implementation of extension at the field level. Here farmer response depends on the PPL's ability to organize a group and a visiting schedule, to build close rapport with at least a minimum number of contact farmers, and to improve their practices and pass them on to their neighbors by demonstration practices. Based on this model, two categories of food crop farmers and fishermen were defined:

- (a) Contact farmers and fishermen (1 for each farmer/fisherman group) following most of the PPL's recommendations and achieving 100% of the potential yield increment. This is equivalent to 16 farmers/fishermen per PPL in Java and Bali where one PPL handles 16 farmer/fishermen groups, and to 8 in the Outer Islands.
- (b) Partially participating farmers/fishermen who follow some of the recommendations of the PPL, i.e., 44 farmers/fishermen per group achieving 30% of the potential yield increment, 23 per group achieving 60%, and 22 per group achieving 80%. It is estimated to be 99 per farmer/fisherman group formed and 1,584 farmers/fishermen per PPL in Java and Bali, and 792 in the Outer Islands.

For estate crops, it is assumed that only an average 50% of the potential incremental yield will be achieved by the farmers reached. For livestock, about 30% of the livestock population is expected to be covered which would achieve 100% of the potential increment. Using the number of incremental field staff to be recruited under this project and their projected farmer/area/livestock coverage, the impact of the project was calculated.

7.05 Development Period. The final incremental production due to the project is given in Annex 5, Table 2. It is assumed that achievement of potential incremental yields and production of the representative food crops and poultry products would require five years, commencing in the year following introduction of extension in various districts and provinces. The development period for fish production is assumed to be three years, and for tree crops, ten years. A two-year lag was assumed for the benefit stream following the construction of RECs and the recruitment of the staff. These assumptions are built into the total benefit stream given in Annex 5, Table 3.

7.06 Prices. Estimates of farmgate prices for the food and tree crops for 1985 and beyond are based on projections of world prices in constant 1986 currency value for those commodities. For the local fish, food crop, and livestock products, which are generally not internationally traded and for which long-term price projections are not available, estimates of typical local farmgate prices have been made for 1985, and these prices have been assumed to remain constant in real terms over the life of the project. Although the potential yield increments were derived under the assumption of negligible increases in input usage, the gross benefits for each commodity presented in Annex 5, Table 2, have been reduced by 25% in Annex 5, Table 3, to account for any incremental input usage which may be necessary.

7.07 Rate of Return and Sensitivity Analysis. The indicative project economic rate of return (ERR) based on the foregoing set of conservative assumptions is 32%. The ERR is relatively insensitive to change in either costs or benefits. Costs could rise by 236% before the ERR would fall below 10%. Benefits could decrease by 70% and the ERR would still be 10% (Annex 5, Table 3).

C. Environmental Effects

7.08 The only foreseeable significant environmental impact of the project would be a positive one in that the introduction of extension recommendations in the upland and transmigration areas, where erosion due to agricultural practices is currently a problem, would be reduced.

D. Risks

7.09 There are no significant agricultural risks, but the project has faced some management and organizational constraints, and the funding problems recently encountered by GOI have severely impaired the effective delivery of extension. These issues have been thoroughly addressed during project reformulation. Although they still remain complex, project management and organization have been strengthened as have those of the overall extension program. BAPPENAS and the Ministry of Finance have given an assurance that they will restore recurrent funding of extension to adequate levels, but sufficient funding of the overall extension service still remains the major project risk in the view of the country's economic situation.

VIII. AGREEMENTS AND RECOMMENDATION

A. Agreements

8.01 During negotiations in 1986 and subsequent project reformulation in November/December 1987, agreement was reached with the Government on the following points:

- (a) An adequate level of funding for the effective operation of the extension service would be made available each year (Para. 3.04). GOI would agree that funds for this in the development budget for the existing service outside the NAEP III Project would never be lower than Rp.15 billion per year.
- (b) No additional extension mobile units will be bought until a full cost-effectiveness study has been carried out on the use of existing ones. Likewise the final 40 animal health mobile units will only be purchased after the initial five have been purchased, used for a year, and been subject to review (Para. 4.11).
- (c) Annual long-term training programs satisfactory to the Bank would be submitted to the Bank by December 31 each year, starting in 1987 (Para. 4.21).

- (d) Consultants for technical assistance in extension, monitoring and evaluation, and rural sociology would be employed commencing no later than September 30, 1988 (Para. 4.24).
- (e) An annual operation plan (AOP), which would summarize the provincial AOPs, would be prepared and submitted to the Bank each year by November 1 for concurrence, commencing November 1988. (Para. 4.27).
- (f) Vehicles would be purchased by ICB, and not under reserve procurement (Para 5.05), and extension materials would be produced by force account through AICs (Para 5.07).
- (g) GOI would agree to gradually take over a share of incremental operating costs, extension materials, and trials and demonstrations which IBRD would fund at 100% in GOI's financial year 1987/88 and 1988/89, at 75% in 1989/90, and at 50% in 1990/91 and thereafter (Para 5.08).
- (h) In mid 1989, eighteen months after issuance of the said Instruction Letter, a joint Bank/GOI evaluation would be made to review the effectiveness of the organisational structure. The recommendations of this review would then be formally embodied in any necessary amendment to the ministerial decree (Para 6.03).
- (i) The M & E consultant would prepare an improved M & E system for the project's physical and financial programs and for the overall seasonal extension program within three months of his arrival (Para 6.20).
- (j) As a condition of reformulation, an Instruction Letter of MOA concerning the assignment of the Head of the Agricultural Education, Training and Extension Division in the Office of the Kanwil to be responsible for overseeing all extension activities in the province and ensuring that all agreements reached in the FKPP I are implemented under the overall direction of the Head of the Kanwil, would be issued before February 29, 1988. This instruction would make clear that in this capacity the Head of the Extension, Training and Education Division would assume the duties of the BIMAS Secretary for the day-to-day running of extension activities in the province; and he would be appointed Co-Chairman of the Tim Kerja for FKPP I and in practice would normally chair its meetings (Para 6.01).

B. Recommendation

8.02 With the above assurances and conditions, the reformulated project is suitable for continued disbursement of US\$55 million of an original Bank loan of US\$70 million for a term of 20 years, including a 5-year grace period, at the standard variable rate from the effective date of the project. The Borrower would be the Republic of Indonesia.

Background Paper for Roundtable for Repelita V Preparation

The Role of Agricultural Extension in Indonesia, and
Issues for the Next Decade

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A. BACKGROUND

1. Agricultural extension can be defined as the provision of increased knowledge and skills necessary for farmers to be able to adopt and apply more efficient crop and animal production methods to improve their productivity and living standards. It depends crucially on effective communication, which has to be a two-way process between farmers and extension workers. Internationally experience with the role of extension in improving the productivity of farmers in developing countries such as Indonesia shows very clearly the key function of three ingredients for success:

- (a) Inputs - seeds, fertilizer and pesticides - adapted to local conditions and practices;
- (b) An acceptable production technology, which has to be derived from research, which is principally done by research agencies, but can of course also be done by the farmer himself; and
- (c) Once the farmer has progressed beyond the subsistence stage, a market for his products and related infrastructure.

2. There are other components of success, but these are supportive. Credit for instance may well assist by making inputs more readily obtainable by the farmer; government price and subsidy policy can likewise create vital incentives or disincentives. Extension itself is not an essential element for improving productivity, its role is largely one of speeding up the dissemination process of new technology, which in its absence would be much slower.

3. In Indonesia's case this dictum is well exemplified by the success of reaching rice self sufficiency over the past decade. A new technology in higher yielding rice varieties and improved cultural practices was available from research; BIMAS provided an input program which coordinated input supply, credit and marketing; government subsidy policy created additional incentives; and, expanded extension services under DGPCA in all rice areas, based on a well organized training and visit extension approach further assisted rapid adoption of the new technologies.

4. However, as Indonesia moves into the next decade, it is faced with the problem of how to further diversify its agriculture to increase farm incomes and develop expanded exports from agriculture, now that the oil price

has fallen and the recurrent funds to support such development have become much scarcer. In discussing Indonesia's agriculture development over the next decade the country is faced with a number of critical issues; and as further background to this paper it is well to remember the key objectives to be reached:

- (a) To maintain rice self sufficiency in the face of increasing population pressure and with reductions in existing levels of pesticide and fertilizer subsidy;
- (b) To diversify into export crop and livestock/fishery enterprises to improve both national and farmer incomes in the face of much reduced revenues from the oil sector;
- (c) To reduce rural poverty by improving both levels of nutrition and farmer incomes over very diverse socio-economic situations while preserving an often fragile resource environment. Situations vary from densely populated eroding upland areas in Java, to poor infrastructure, often infertile soils and with limited improved technologies for development in many of the outer islands.
- (d) In reaching these goals Indonesia needs to capitalise an abundant but often ill-trained human resources, and plentiful but often fragile natural resources. It needs to identify in each agro-ecological zone the enterprises that have the biggest scope for rapid development, where existing constraints can be most readily alleviated and which create additional direct or indirect gainful employment for the burgeoning numbers of unemployed or under employed Indonesians.

Since the roles of research and extension are so closely interlinked, I've touched on some of the research inputs as well as those of extension in discussing several points concerning these four key objectives.

5. Research has a key role to play in maintaining rice self sufficiency by releasing new varieties that have both higher yield potential and are resistant to key pest and disease problems, of which Brown Plant Hopper is the most serious. Hybrid rice research should continue as it has the potential to give significant yield increases that will enable self sufficiency to be maintained on a reduced rice area freeing either land or one of the growing seasons for alternative crops. Extension has a key role to play likewise by introducing Integrated Pest Management regimes that reduce the need for pesticides, and emphasize improved agronomic and rotational practices to offset possible lower levels of fertilizer application. Provision of inputs, especially quality seed needs additional attention, especially in outlying provinces.

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6. For diversification, research has a key role to play in introducing better technical recommendations for the most promising enterprises that have comparative advantage in the varying agro ecological zones. Micro-economic research has to assist in defining which are the enterprises, which can give the farmers the best return in these varying agro-ecological zones and/or geographic regions. The extension service then has to disseminate the improved recommendations to the farmer in a better combination of face-to-face extension and integrated use of the media. In all cases more attention has to be given to post harvest technology to add value (which often means quality as well as processing) at the farm gate or close to the farm gate to increase both employment and incomes in the rural areas. Improved infrastructure, rural electrification and marketing facilities and removal of restrictive monopolies on transport (especially marine transport) all would have a very beneficial effect on stimulating such development, together with appropriate credit provision and broader development of rural financial markets. While many primary commodities are facing declining price forecasts, key enterprises with good prospects for development in varying locations include: legume grains to increase oil supply and improve soil fertility; corn for livestock feed and export; fruit and vegetables; cloves, spices, essential oils and beverages (coffee, tea and cocoa), which all have a potential big pay off to improved extension as it is currently almost non existent for smallholder estate and industrial crops outside current special schemes; coconuts for copra, etc.

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7. Reducing rural poverty will hinge on improving nutrition and farmer incomes by introducing better adapted technologies discussed in Para 3 above, and in targetting the poorest kecamatans in the country under area development projects that will require an integrated rural development approach to be coordinated by better trained Bappeda staff at provincial and district levels. It will also require a change in the approach to extension by which traditional farmer groups are made more democratic, and include farmer representatives who are drawn from the resource-poor farmers, and more attention to women and youth. Much more attention will need to be given to developing self reliance in rural communities in view of the shrinking budget to fund more government support, which in any event is rarely fully responsive to farmer requirements.

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8. In order to make best use of the human resource potential, major emphasis over the next decade has to be placed on institution building, improved management and organization and on staff and farmer training. This is already receiving special attention for research, where in agreement with AARD the next World Bank financed project will focus on improved research management, development of a master plan for the next decade and improved programming of research on better defined priorities. Likewise in improving its extension service, GOI is now emphasizing better coordination of extension delivery in a unified service at the grass roots level, with a single line of command. The approach to extension will need to change over the next decade from a nationally mandated production driven approach to a more educational approach in which the farmer is made aware of the profitability as well as technical advances for a range of enterprises he might include in his farm system. This also implies that there has to be a better understanding of the national resource base, and so the potential for varying agro ecological zones

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in each broad geographic region has to be better understood, and site specific recommendations made for each zone. This implies a reordering of research (presently organized on a national mandate basis for each of its stations) to also provide regional recommendations. This will require more emphasis on the farming systems research approach, already being widely adopted by AARD with examples in each of the main agro-ecological zones. This has also to be followed up with more location specific extension recommendations, which calls for better research extension linkages and the production of provincial farm budgetting handbooks.

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B. REVIEW OF ISSUES IN AGRICULTURAL EXTENSION

9. In moving from giving major attention to rice development, Indonesia has already made considerable changes in the emphasis of agricultural enterprise production programs and the way in which it organises and manages its extension service. BIMAS has been separated from the Directorate General of Foodcrops, and programs now exist for intensifying palawija, estate crop horticultural crops as well as livestock and shrimp production. These programs are all coordinated by BIMAS, which has also been given responsibility for the administration of all field extension staff at the PPS (provincial and district specialist trainers), PPUP (REC supervisors) and PPL (village level workers) level. The extension service has been unified at the grass roots level at the Rural Extension Centre (BPP - Balai Penyuluhan Pertanian) and committees, which include all four Directorates General of Food Crops, Estate Crops, Livestock and Fisheries, together with staff from BIMAS, AAETE and AARD coordinate extension activities and approve seasonal programs at the national, provincial and district level (see Chart I). At each level one person is now charged with seeing that the programs agreed by each party in the committees are carried out. At the provincial level the man responsible is the Kakanwil Pertanian, delegating day to day responsibility for overall supervision and reporting back to the FKPP I committee to his Head of Extension and Training Bureau (Kepala Bidang Diklatluh); while at the District level it is the Kepala Dinas who is selected as head of FKPP II, that has prime responsibility delegating day to day supervision to the District Bimas Secretary. There is thus now a single line of command through the extension service, which should improve both program implementation and accountability.

10. The main issues now affecting extension can be summarised as follows:

- (a) The need to consolidate and strengthen the new management structure;
- (b) The need to develop more appropriate technical messages in a farm systems context for each agro-ecological zone in a region;
- (c) The need to ensure adequate funding of the expanded extension service, and hence to experiment with cheaper methods of reaching more farmers:

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- (d) The need to move to a more educational approach enabling farmers to choose the most suitable enterprise for their environment, management ability and inclination as opposed to trying to impose production programs from above;
- (e) The need to improve farmer awareness of potential costs and profits of investing in different enterprises by the provision of farm budgetting handbooks at provincial level for varying agro-ecological zones;
- (f) The need to develop more farmer self reliance, and to reach more resource poor farmers, women and youth by broadening activities within farmer groups;
- (g) Additional focus has to be placed on value added at the farm level, which calls for more attention to agro-processing, marketing and rural infrastructure in the form of roads, electrification and communications. This can have a key impact on rural employment as well as increasing farmer incomes and potential higher value exports; and, INFRASTRUCTURE
- (h) All these activities will call for some changes in the mix of skills available in the extension service, and an expanded program of training and upgrading of staff, as well as of farmers themselves.

I will now deal with each of these issues in turn.

11. Strengthening the new organisational and management structure. In the short term this involves more effective leadership at each level to ensure the smooth running of the FKPP committees, more effective planning and implementation of seasonal extension programs and better coordinated training programs especially for the PPS, who then train the field level staff. In the medium term, it also means consideration should be given to:

- (a) The creation of the Kandep post at district level to parallel that of Kanwil at the province and to clearly vest in one person the responsibility of coordinating all agricultural programs at that level; D.N.
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- (b) Better integration of other dinas activities as well as extension, which also have to interface with the farmer: on the food crop side this means the plant protection division for better integrated pest management, the crop production division for conduct of multi-locational trials and better seed provision, and the economics and marketing division for improved farm management, crop budgetting handbooks and market intelligence. The other three services - estate crops, livestock and fisheries have a similar structure that should similarly become more integrated into overall extension programs.

- (c) Creation of a regional capacity in groups of three or four provinces to provide better research extension linkage that cannot presently be achieved on a provincial basis due to the present organisation of AARD (see para 12 below).

In the longer term, this could well mean a reorientation of the whole structure of the Ministry at the provincial and district levels with the extension divisions of each dinas being merged, and the economics/marketing staff also being merged into single units. ✓

12. Regional and Agro-Ecological Zone Approach. The development of more location specific technical recommendations will require production potential to be assessed on a geographic regional basis within a matrix identifying each regions agro-ecological zone. The smallest building block for this approach should be the REC working area or WKBPP, which is the field level area for extension planning and the REC should become the unit for aggregating human and natural resource potential for planning purposes. This approach can be further aggregated as a basis for district and provincial plans and data books, and will require provinces to be grouped to organise effective support from AARD research staff into training of PPS and assisting with developing location specific recommendations. This will also require AARD research stations not only to have a national mandate, but also a regional one to meet the needs of farmers in the provinces in or near which they are located. ✓

13. Funding Support. It is vital that adequate recurrent funds are provided by GOI to produce the new technologies from research and keep extension staff effectively operational. At a time of scarce recurrent funding resources, a switch may have to be made to reducing subsidies on inputs to ensure funds are available for these activities. By making farmer groups more self reliant and giving their leaders a say in running their local REC, farmer contributions might also be tapped to help maintain and further develop REC's. Of more importance, however, will be more effective use of the media so that less face-to-face extension is needed in the more developed areas, and existing staff can be redeployed. The media in any event will have to play a larger role in remoter areas, and should also be used to upgrade field staff by the use of distance learning programs. ✓

14. Revised Extension Methodology. Over the next decade it will be important to move from a largely top down production driven approach to extension to a more educational approach. This should provide farmers with relevant technical and financial information on different possible enterprises suitable for their agro-ecological zone from which they can choose in accordance with relative profitability, risk assessment, management requirements and their own personal inclination. It will of course require more location specific research, the production of farm management handbooks on the relative costs and returns to investing in varying enterprises as well as better market intelligence. It will thus require much closer liaison between PPS and research staff from AARD on the one hand, and staff from the economics and marketing departments of each Directorate General (foodcrops, estate crops, livestock and fisheries) on the other. The rationale for this

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has been discussed in more detail in the final report of the four month management study carried out by the Pusat Pengembangan Agribisnis for the National Agricultural Extension II Project that was completed in March 1987. It will of course require changes in the conduct of extension programs and in the training of all extension staff, and it will evolve over time as more appropriate location specific technical recommendations become available, as staff are upgraded and as a new generation of better educated farmers change the ability of the clientele to receive and absorb new information.

15. Farmer stratification and self reliance. The new approach will also need to be more sensitive to the needs of farmers with varying resources by stratifying different types of farmers in farmer groups and developing varying recommendations for each of them. A present fallacy is that the large mass of poorer farmers can copy the lead given by farmer leaders (Kontak Tani) and other progressive farmers. However, since farmer leaders and progressive farmers in 90% of cases have more resources than many of their peers, risks are usually too great for smaller-scale resource poor farmers (or households, where the breadwinner is away in local or more distant towns to earn a living, and the wife is left to run the farm) to follow their example. Farmer groups need to select from within their number additional Kontak Tani who are representative of such householders and they should demonstrate specially prepared risk averse programs more suited to their stage of development for other farmers in their groups. Likewise groups should become more democratic by selecting different farmers with varying expertise to be their specialists on particular types of crop or livestock enterprise so they attend the relevant skill course and not always the one Kontak Tani, who is the group leader. This already happening in many areas, but it is still the exception rather than the rule. The whole new approach has to be one of partnership between the extension worker and the farmer, and farmers should gradually become more self reliant. They will also have a larger say in the running of their local REC, and may even contribute to its upkeep or improvement. In many areas rural development programs are already involving farmers in constructing self help rural roads and water supplies, or organising revolving loan funds at the hamlet level as in the Yogyakarta Rural Development Project, which is increasing their self reliance, and making them more independent of government support for which funds in any event are becoming scarcer. Farmers already sit on extension committees at various levels right up to the national level, and they should be making a key input into the design of extension programs at the REC level, commenting also on the problems and successes of previous extension programs. The formal mechanism for this is in place, but it is not universally followed and a more conscious effort has to be made by extension workers in the manner they work with farmers and their representative leaders.

16. Agro-processing and marketing. Until now more attention has been given to increasing farm incomes at the production end rather than the processing end. This balance needs to be redressed in the recognition that adding value to produce at the farm level by improving quality, better grading and packaging, or by further processing can not only improve farm incomes but also increase employment out in the rural areas. The opportunities for this are assisted by present rural road and electrification programs, but they could be further assisted by more attention to all aspects of agricultural processing and by fostering small local crafts and industries.

17. Coordination. We have already stressed the need for coordination within the Ministry of Agriculture's extension programs by greater use of the FKPP committees. This has to be widened for broader rural development programs, which is where the BAPPEDA planning agencies at provincial and district level have their roles. In irrigated sawah areas, training programs for improved water management involve both Public Works and Agriculture; in eroding upland areas, such programs involve both Forestry and Agriculture; while in swamp transmigration sites, programs involve Public works, Transmigration and Agriculture ministries. With increasing decentralisation of development programs to the district level and below, more use will have to be made of the Bappeda Tingkat II in the kabupatens, the UKPD at the kecamatan level, and the LKMD at the village level. Extension staff have thus to be aware of their role in the overall development program, and staff of the varying agencies concerned trained to develop a more concerted and service oriented approach.

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18. Training. Since many of the activities discussed above call for changes in extension approach, and demand more emphasis on skills in farm management and agro processing, this has to be reflected in manpower training plans and in the nature and curricula of extension training programs. To reduce extension costs and to respond to the increased educational standards reached by the new farming generation, more use has to be made of the media and of distance learning in both training staff and reaching farmers. A review of manpower needs will be essential once the priorities for Repelita V have been agreed, and the nature of the way staff are trained should at the same time be reviewed to accommodate the evolving approaches to extension and new technologies in communication.

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19. This brief overview of the present role of extension in Indonesia, and further changes that are needed to meet new challenges now facing the country, will I hope help to stimulate more discussion on how the present extension service should best evolve to effectively meet these challenges over the next decade.