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TECHNOLOGY TRANSFER ASPECTS

FOR DESIGN OF

THE AGRICULTURAL PRODUCTION CREDIT PROJECT

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Prepared for USAID/Cairo

FEBRUARY 18, 1986

Ralph J. Edwards
Development Alternatives, Inc.

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OUTLINE

	<u>Page</u>
I. BACKGROUND	1
II. PROGRESS AND EXPERIENCE TO DATE	3
A. What Has Been Demonstrated?	4
B. What Has Not Been Demonstrated?	5
III. WHITHER GOEST? (ie.-WHERE DO WE GO FROM HERE?)	6
IV. DESIGN AND IMPLEMENTATION ISSUES.	9
V. CONSIDERATIONS IN DESIGN	13
A. Sectoral Policy Dialogue	13
B. Project-specific Parameters	14
C. Technology Transfer Aspects	16
D. Cost Estimates for Technology Transfer Commission	17

I. Background

To date, none of the the agricultural projects supported by USAID have been directly concerned with increasing agricultural production in Egypt on any type of wide-scale basis. Rather, most of them have been directed toward the development (or generation) of technology suitable for use by Egyptian farmers in improving productivity. However, these projects have also included a direct link to actual on-farm conditions by use of verification trials conducted in farmers' fields. Following field verification the use of resulting recommended practices, usually in the form of a technological package, was then demonstrated relatively widely in fields of cooperating farmers in selected areas. The mechanism for the demonstration portion of each project has been through the use of Ministry of Agriculture (MOA) extension agents selected, supervised and supported by the project which, itself, has usually been under the Agriculture Research Center (ARC). Projects which have followed this approach include the Major Cereals Project (EMCIP), Rice Research and Training Project (Rice) and Agricultural Mechanization Project (Major Mech). The Egypt Water Use and Management Project (EWUP) under the control of the Water Resource Center of the Ministry of Irrigation (MOI), but with direct participation by the ARC, followed essentially the same model through the verification stage, but did not include a demonstration phase with use of extension agents. The primary focus of these projects thus was to build a capacity in the GOE, largely in the ARC and the WRC, to develop and verify production-increasing technology and to demonstrate, on a limited scale, that such technology would be accepted and used by Egyptian farmers. Each of these projects carried out activities involving extension in a number of Governorates; EMCIP in 10; Rice in six; Major Mech also in six and EWUP in two. Although no single Governorate had activities under all projects a number of Governorates had activities of two projects and at least one, Gharbiya, had three.

Another project, the Small Farmer Production Project (SFPP), focuses directly on the use of improved technology by farmers in conjunction with the use of agricultural credit, but on a demonstration or pilot-scale basis. The SFPP involves activities in three governorates; Assiut, Kalubiya and Sharkia. In total those Governorates contain 156 Village Banks. SFPP has worked, to date, with 38 of these Village Banks. Under this project recommended practices are obtained from the research system and provided, along with the necessary physical inputs of seed, fertilizer, pesticides, etc., to farmers who obtain loans from the Principal Bank for Development and Agricultural Credit (PBDAC). This project also selects, supervises and supports certain extension agents from the MOA Extension Service who work directly with participating

farmers in the use of improved technology and the associated inputs. In the SFPP project the primary purpose is to improve the capacity of the PBDAC system to provide credit to small farmers and to demonstrate that such farmers will both avail themselves of additional credit at a higher rate of interest and use the improved technology which this credit will buy.

The underlying premise for the design of the above projects is described in the Agricultural Sector Assessment and Strategy which was prepared in January 1980 as an annex to the CDSS submitted that year. That document states, in part, the following:

"Adapted technology for immediate use by farmers is an expected output of several projects. ... The focus of our efforts is on technology development for the major crops including the establishment of links with international research centers in order to maintain a flow of technology in the post-project period. With the existing availability of Egyptian scientists and of reasonably successful research programs, inputs in these areas can be expected to provide significant returns."

... "The task is that of revitalizing and adapting the system to meet the needs of small farmers. For each organization, the exact problems and the complexity differ, but, generally, improved efficiency and better links within the bureaucracy and between the bureaucracy and farmers are needed. Specific problems are those of poor information flow to and from the farmers, low salaries, an excess of personnel and a lack of planning. We cannot affect salaries and staff numbers except through policy discussions, but information flow and planning can and will be addressed." (in projects) "The method proposed is a vertical crop approach which includes attention to both research and extension and the establishment of institutional links between research and extension. The lack of this particular linkage has been identified in the past as a severe problem and a constraint to information flows. As indicated, we propose to help overcome that problem, initially on a crop basis where we feel it is more manageable, and perhaps in the long-term (four to five years) on a more aggregate or horizontal basis. We will also seek to ensure close coordination between different crop projects, in areas such as extension, to lay the groundwork for possible later horizontal efforts dealing with more general research and extension problems. By the end of the five-year period we believe that significant experience will have been gained and the necessary rudiments of an effective organizational structure will be in place to permit refinement and expansion via follow-on activities."

Now, in early 1986, all of these projects except SFPP have completed their span, or will do so within a few months, and expatriate TA staff have departed Egypt. For SFPP the termination is only a year later in August 1987 --although the majority of the current resident TA staff is new to the project, having arrived in Egypt within the past year. Therefore the point in time indicated in the paragraph above has

arrived (one year behind schedule however) and it is appropriate to assess the experience gained and consider how and where to proceed with "follow-on activities". Since the primary concern of such an assessment is directed toward the design of a follow-on agricultural credit project, the bulk of the attention will be directed to an analysis of what has happened in SFPP and to identifying those aspects (including proposed modifications) which should be considered in expansion. However, the experience in several other projects is also directly relevant, particularly as concerns development and verification of production-increasing technologies. Also directly relevant are the results of the different procedures used by various projects in establishing linkages through extension to the farmer.

II. Progress and Experience to Date

It is clear in the short period of time available for this study that a comprehensive evaluation of SFPP and other research-extension activities is neither possible nor necessary. Several evaluations as well as extensive project reports and technical documents from all projects are available. They form the primary data base for development of specific aspects of future projects, and as such should receive intensive analysis as required during detailed design. For the purposes of this assessment, leading to finalization of a project concept and the preparation of a PID, a more general over-sight is appropriate, concerned with the question of what has SFPP (and other projects) demonstrated. Equally relevant is an understanding of what has not been demonstrated. The general framework for a second generation project(s) should emerge from what is garnered from the answers to these two questions, combined with information from other applicable experiences.

The methodology used was that of review of relevant documents, particularly summary and end-of-project reports, as well as analyses and concept papers prepared by various Mission, GOE and project personnel. Interviews and discussions were conducted, both in Cairo and in the field, with a wide range of knowledgeable people, including Mission staff, current/former personnel of SFPP, EMCIP, Rice, Major Mech and EWUP projects, GOE officials in the MOA, ARC and WRC, the Governor of Damietta (who has an agricultural background and project experience) and the previous Minister of Agriculture. Field trips were made to on-going SFPP activities in Sharkia, expansion SFPP-type activities in Gharbiya and Menoufiya, an agricultural machinery center in Kalubiyah, and to research and extension activities in Beni Suef and Minya. Discussions were held in Governorate offices, Governorate Banks, District Banks, Village Banks, Research centers, extension offices and in farmers' fields with the full range of officials, staff and farmers that might be expected.

A. What Has Been Demonstrated?

What emerges is a reasonably clear picture of accomplishments in research and extension over the past several years. Four major changes seem to have been clearly demonstrated. These are:

- a. Researcher confidence in technologies to recommend.
- b. Role and value of Subject Matter Specialist recognized.
- c. Farmer willingness to take credit and use technology.
- d. A team effort at District level and below is essential.

Researchers now have confidence in the improved practices which they recommend for adoption by the farmer because the researchers not only participated in developing the practices but also took part in verification trials on farmers' fields under actual farm conditions. As a result they know that their recommendations will work and that farmers will accept them. As a result there is now a range of recommended practices for farmers to use to improve their productivity. Furthermore the researchers are convinced of their responsibility to participate in the process of making sure that these practices are properly transferred to the farmer and are prepared themselves to participate in taking them to the farmers' fields.

The major factor in this transfer of technology process is the emergence of the Subject Matter Specialist (SMS) as the critical link between research and extension. This role seems to be recognized, understood and valued by farmers, extension agents and researchers alike. The development of an effective working relationship among them at the District (Markaz) and village levels is essential for a successful program.

Farmers have clearly demonstrated a willingness to use additional credit, even at much higher interest rates, and to also use the inputs which this credit supplies. It is less clear whether the farmers follow the recommendations fully or whether they modify various recommendations, particularly fertilizer applications, in order to more nearly meet their priorities as they see them. Interest on the part of the farmer was particularly striking in Gharbiya and Menoufiya Governorates where PBDAC is currently expanding SFPP-type activities. Despite a Bank-desired level of only 25 farmers in each Village during the first year of the program the participation in Gharbiya was nearly triple that amount with the level estimated to go to 150 for the summer season. In Menoufiya, which initially held to the 25 level, demand for the summer season is such that a participation of at least 100 in each of the three initial villages is estimated. One Village Bank showed a list of signatures of 203 farmers who had already expressed interest in obtaining loans for citrus production (for fertilizer and pesticides --not to establish orchards) for the new season which starts on April 1.

Wherever the program has demonstrated success through strong farmer participation and by improvements in production levels there is also a strong "team effort" at both the District and village levels. Although the SMS is clearly seen as the access link to obtain new technology from the research system, the key to making the whole process work is having a trained, experienced and dynamic District extension supervisor. In Sharkia where the District supervisor was trained by SFPP and in Gharbiya where he had considerable experience with EMCIP the program at the District and village levels was operating well. By contrast, in Menoufiya where the trained District supervisor (by EMCIP also) had been promoted and was replaced with a supervisor without such experience the program was operating but with little, if any, understanding of what really needed to be done.

B. What Has Not Been Demonstrated?

A model for widespread replication exactly along the lines already used has not been demonstrated. This is due to several characteristics of SFPP as it has been implemented. These are:

1. Farmers were required to take an entire package --no more and no less--in order to obtain credit.
2. Virtually the entire loan was made in-kind, not in cash.
3. The project itself provided all inputs -which were not available through any other source.
4. Most, if not all, of the technological packages were obtained and developed by project personnel rather than by a system operating down to the District level.
5. The TA provided was too intensive, and therefore too expensive, for wide-scale replication.

This does not say that what has been done under SFPP cannot serve as a model for wider application in Egypt. It only says that replication cannot --and should not-- be done exactly as it was done under SFPP. Instead it is necessary to draw on the positive aspects while understanding which elements need to be modified in a broader program. By far the most positive aspect is the almost universal perception, in the GOE and in AID, that SFPP is a successful project. It is successful --as a pilot-- and it is not only proper but highly desirable to capitalize on that momentum. However this must be done in ways which are more appropriate for a much wider undertaking.

III. Whither Goest? (ie.-Where Do We Go From Here?)

PBDAC and the GOE have already embarked on an expansion of SFPP-type activities in 8 additional Governorates. It is noteworthy that this, itself, is an expansion from an original list of six due to pressure from several Governors for inclusion in the program. One of the two additions is Damietta where the Governor is agriculturally trained (PhD in Agricultural Economics) and with considerable prior experience in development projects. So there is no question that the interest is there and that there is momentum. The concern now is how best to proceed with the next phase, encouraging initiatives already underway (both individual and collective) without smothering them, while simultaneously redirecting efforts in more effective and efficient directions.

The redirections that are needed are:

1. A move away from strictly supervised (one could say over-supervised) credit to less supervision, particularly by the PBDAC system.
2. More flexibility in recommended practices.
3. Increased credit in cash in place of in-kind.
4. Improved access to non-PBDAC sources of inputs.
5. Establishment of effective working relationships among research (SMS's), extension and farmers at the District (Markaz) level and below.
6. Provide TA (as regards technology transfer aspects) at as minimal levels as possible requisite with promoting and guiding item 5 above.

A move toward less supervision of farmer activities by Bank staff, credit in cash instead of in-kind, and input availability from outside the PBDAC system (ie. from private sector sources) all depend on policy and administrative decisions made outside of the technology transfer aspects of an expanded project. However these decisions -- along with a decision to allow greater latitude for farmer choice by means of flexibility in use of recommended practices, which can be determined administratively within the extension portion -- are essential if an expanded project is to have any hope of breaking out of the production limits imposed by presently-used technology. These will also have to be accompanied by policy decisions to ease agricultural output and input price restrictions which currently hinder agricultural productivity in Egypt. These pricing policy decisions are likewise made at a level well above that of just the technology transfer element.

The concerns that need to be addressed within technology transfer start with the need to allow the farmer greater flexibility in accepting and applying recommended practices. This flexibility, associated with availability of cash credit and a choice of sources for inputs, is a necessary requisite for the development of a viable long-term working relationship between farmers and the research and extension systems. The farmer already seems to be doing some modifications to the technology package, particularly with fertilizer applications and use of labor and machinery. However, these are hard to pin down since such changes are not supposed to happen. Bank staff and extension agents are seldom willing to admit to "outsiders" that this is happening and farmers are likewise reticent, particularly in the presence of GOE personnel. If such flexibility is not made a conscious and deliberate part of the program then pressures to conform to government-issued recommendations, combined with the culturally-rooted tendency to accept the advice of those with academic training (ie. researchers, particularly those more senior) as approaching infallibility, will simply limit production increases because of the failure to allow for localized variabilities and conditions. Compared to almost anywhere else, Egyptian agricultural conditions are exceptionally homogenous. They are not, however, so uniform that local heterogeneities can be safely ignored, particularly at the production levels required in Egypt.

Discussions with personnel of ARC indicate a very strong awareness of the need to permit flexibility to the farmer in the use of recommended practices and the parallel necessity for the researcher to be closely aware of what happens in the field with the recommended practices in order to detect problems and shortcomings which must be addressed (or readdressed in the research program). This feedback loop from actual field use to the research system is absolutely essential for an effective research program. Agricultural research is not, after all, a producer of absolutes and perfect solutions. Each gain is, at best, only a somewhat closer approximation. Unless this feedback loop is maintained in very close proximity to the location where a problem(s) is occurring then the probability of receiving effective feedback information is greatly reduced. If the feedback loop is required to traverse all the way up the extension system to the national level before feeding over into the research system, as often happens in many national systems, then the only certainty is that research will be very much less effective.

Within the ARC there is a stated willingness, almost a sense of purpose, that they have a responsibility to fully participate in the technology transfer or extension process, not only to help assure that the farmer receives quality information, but also as an essential and irreplaceable element of their research programs. ARC clearly views the

SMS as the link in this process and are dedicated to providing and supporting them. Several senior ARC officials, including Dr. Shehata, the Director General, have spoken of their progress in expanding and institutionalizing the on-farm verification work, initiated in the EMCIP and Rice projects, as a Farming Systems or Agricultural Systems program. The primary purpose of this program will be to continue on-farm verification and to provide the SMS's who directly support the Extension Service in programs directed at increasing agricultural productivity. The ARC five-year plan includes such a national program called "Agricultural Systems and Crop Intensification".

Likewise within the Water Research Center of the Ministry of Irrigation there is considerable concern about how technology for on-farm water management is made available to the farmer. Dr. AbuZeid, Director General of WRC, displays a concern (and describes a program) almost identical to that of Dr. Shehata of ARC. In effect the WRC proposes to add a Water Management Specialist (WMS) and an O&M Engineer in parallel positions reporting to an Engineer Chief at the Cercle level (covering 10-20,000 feddans and approximating the Markaz level). This WMS would have a staff of 2-3 assistants each responsible for 1-2 Branch canals each with 3-5 Meskas. Essentially the WMS of Irrigation is equivalent to the SMS of Agriculture. They too must be incorporated into an effective team working with the farmers.

IV. Design and Implementation Issues

Compared to the extensive lists of major issues which are raised in the separate consultant reports on the Credit and Financial Institution and the Privatization aspects, the listing of policy and administrative concerns for the Technology Transfer aspects of the proposed project is much shorter. Several of these, however, are identical to or overlap with issues raised in the above reports but which also impinge directly on the area of concern of this report due to their long-term effects on improving agricultural production. Those policy issues which directly and exclusively concern the transfer of technology are essentially not complicated. Furthermore they are subject only to administrative decisions within the exclusive purview of the Ministers of Agriculture and Irrigation. However, the list below also includes a policy issue not raised in the other reports but which is, nevertheless, the most fundamental issue to be faced in any attempts to increase Egyptian agricultural production. This is the issue of output prices for agricultural commodities. No project which contemplates increasing agricultural production can proceed without consideration of this issue. The timescale for a complete change in this regard must necessarily be long-term but changes are unavoidable. At a minimum, for a project to proceed, at least marginal incremental improvements must be within the realm of possibility for efforts extending even 3-5 years into the future.

These design and implementation issues, listed in decreasing order of importance and level of involvement within the GOE are as follows:

- A. Highest importance (and difficulty).
 - 1. Output (farmgate) prices for agricultural commodities.
 - 2. Input prices (including the subsidy issue) for agricultural requirements.
- B. Next order of difficulty (perhaps).
 - 1. Privatization issues.
 - 2. Increasing the availability of agricultural inputs to a level which fully satisfies demand.

C. Lowest difficulty (administrative within MOA/PBDAC and MOI).

1. PBDAC.

- a. Provide credit in cash rather than in-kind.
- b. Reduce supervisory role of bank in farmers' activities.
- c. Charge an additional commission on loans to cover the cost of incentives for research/extension support.

2. MOA (Research & Extension) and MOI (Water Mgt.).

- a. Agreement on Markaz-based team effort.
- b. Agreement on provision of incentives to SMS's, WMS's and extension agents.
- c. Provide training on a team basis.
- d. Introduce and insist on flexibility in use of recommended practices.

Because of the structure of agricultural output and input prices in Egypt the marginal return to the farmer is distorted for virtually everything that he produces. The problem for the Egyptian economy, and for those charged with trying to effect improvements, is that these distortions lead the farmer in production directions which are almost exactly opposite to that desired at national levels. The farmer makes his best returns from livestock, vegetables and fruit. Consequently these are what he produces, whenever and however he can, despite lack of official encouragement, or even overt discouragement. For the crops in which the GOE is most interested -- cotton, rice and wheat -- the farmer's return is low and, consequently (since they are all economically rational) he does only as much as he is required to do and/or to meet his own needs -- and no more. Thus the production level of these crops lags behind what would be possible if there was an incentive for the farmer. And even to achieve the production that is attained, the GOE is forced to use several thousand MOA employees during several months of the year, just to supervise and carry out such operations as cotton-worm and rat control programs. It would be time and money better spent for the MOA employees to be doing the sort of things they should be doing, such as assisting in the flow of technology to the farmer, while the farmers looked after protecting their own production. But this will happen only when it becomes in the farmer's financial interest to do so.

All of this, of course, is well known, and has been for years. But over the last ten years, at least, it has gradually worsened, the deficit between production and consumption has not improved or has drastically worsened (as with wheat), the cost of subsidies has increased and options have virtually disappeared. Therefore the GOE has to face up to the need to adjust pricing policy so that the financial interests of the farmers and the economic interests of the country are both moving in the same direction. It obviously is not a simple matter of just changing price levels. The ramifications are far too complex, and expensive, for a simplistic solution. Initially probably no more than marginal improvements can be made, but they must be viewed as incremental changes in the context of moving toward a long-term goal. This has to be, and clearly already is, the context within which further US assistance will be discussed and provided.

Almost as important, and perhaps almost equally difficult to achieve, are the concerns around privatization of agricultural input supply and the closely-linked question of the availability of sufficient quantities to satisfy demand. Here again only marginal changes can be initially expected, but likewise as part of a longer-term process. This area is adequately covered in the separate report by J. Bremer. It is briefly addressed here because of the implications for improvement in agricultural productivity in the long term. Projects and programs can be designed and implemented now which can eventually lead to productivity improvements. But that attainment will only be possible in the context of policy modifications in the above areas.

As indicated, any project efforts should be undertaken in the context of a policy dialogue leading to modifications of specific policy-based constraints over a time-horizon of at least ten years, and probably longer. Modifications which are necessary and expected within the 5-6 year timeframe for APCP will need to be identified and agreed to by both the GOE and AID. Agreement on some of these will need to be achieved prior to initial obligation of even a minimal level of new funds, while others can await later points in the project -- but tied to subsequent obligations, particularly obligations designated for capitalization of PBDAC. These latter conditions, linked to provision of capitalization, are those which concern modifications to Bank operations and procedures, as well as training programs to develop sufficient staff capacity. They are indicated in some detail in the report by J-J. Deschamps.

Those conditions on which substantive agreement has to be reached prior to initial obligation are those which relate to operating procedures more directly involved with agricultural production operations. All of these are within the administrative purview of PBDAC and the Minister of Agriculture (and the Minister of Irrigation) and should be amenable to resolution and agreement at that level and below.

Those that relate more specifically to PBDAC are:

- a). to gradually increase the proportion of cash loans and decrease in-kind loans,
- b). to reduce the supervisory role of Bank employees as relates to farm operations, and
- c). charge an additional commission on all loans to pay for research/extension support.

The above assumes the establishment of an effective program of field follow-up provided by the Extension Service, supported by the ARC, the WRC and agricultural universities. This would not, however, lessen the desirability of providing some agricultural training to Village Bank financial analysts to permit them to be more effective and realistic in their appraisals of loan applications. In order to provide funding for the costs of the research and extension backstopping, the imposition of an additional commission should be instituted on all project loans. This additional charge should be clearly described to the farmer borrowers as a fee to pay for those specific services. Preliminary calculations indicate that an additional 0.5% to 1.0% commission would be sufficient to pay for incentives and support costs for the research/extension (technology transfer) process.

Closely linked to the above would be agreement within the MOA that the provision of recommended production practices to the farmer would be in a much more flexible format that is currently provided. The technology package which is initially suggested would be understood to be a starting point subject to modifications as necessary to meet local requirements. Agreement should also be reached on a Markaz-based team effort, with training provided on a team basis for research, extension and Bank (Financial Analyst) personnel together. This team must also include SMS's from the MOI for on-farm water management concerns. Agreement will also be required on the amounts of incentives to be provided from the fund under the control of BDAC in each Governorate. At the Governorate level a committee composed of appropriate representatives from BDAC, ARC, Extension Service and the Governor's Office, under the chairmanship of the UnderSecretary of Agriculture for the Governorate would establish annual (or longer) workplans indicating amounts of personnel plus level and kind of support to be provided for research and extension. The next step would be the establishment of an agreement for the national ARC, WRC and Extension Service to provide this support according to the annual plans in effect, analogous to a technical assistance contract. With that the national level organizations could then plan their programs with assurance of both requirements and fund availability for their programs in those Governorates in APCP.

V. Considerations in Design

A. Sectoral Policy Dialogue.

So what does all of that mean for the design of APCP for initial obligation by the end of FY86? Obviously it will not be possible to make much, if any, progress in a dialogue on the major issues of pricing policy, privatization and greatly increased supplies --much less on what changes to make-- within the next six months. To insist on having indications of policy changes before initial obligation is unrealistic and would make ACPC a non-starter. It should be realistic, however, to expect to have agreement to jointly develop a Memorandum of Understanding concerning agricultural production. This should include the establishment of a procedure for jointly deciding, within 12 months of agreement, the specific policy and administrative changes to be undertaken with measurable indicators of progress over a 10-12 year timetable. The model to be used would be similar to that for Cairo Sewerage as described in the First Amendment to Cairo Wastewater and Sewerage II.

It should also be possible to obtain, by August, general agreement to make changes in how PBDAC does business, although it might require an additional 12-18 months to agree on the specific changes to be made. The third, and last, item of agreement from the policy dialogue matrix should be that of the establishment of an expanded SFPP-type of program, including modification of the technology transfer process as outlined at the bottom of page 12 and described in somewhat more detail below.

This can be summarized in table form as follows:

<u>DATE(S)</u>	<u>AGREEMENT ON</u>	<u>IN EXCHANGE FOR</u>
AUG 86	a. Modified SFPP-type project for 6 to 11 Governorates. b. Improving PBDAC operations. c. Joint development of MOU.	Initial obligation for approx \$20 M w/o any PBDAC capitalization.
AUG 87 to FEB 88	Program to make PBDAC more financially effective and viable.	First capitalization of PBDAC -approx \$20 to 30 M.
AUG 87 to AUG 91	Progress on effecting policy and administrative changes per timetable established in the MOU.	Annual or biennial additional obligations at agreed rate (\$20-60 M per obligation up to a Project total of \$120-250 Million).

With the above minimal conditions for starting (plus later checkpoints tied to subsequent obligations) then it is possible to lay out a general plan for a project with options available as variants in many areas. It is apparent that the earliest start and the most progress within a 5-6 year timeframe can be made in the technology transfer (or research/extension) aspects. Making changes in the PBDAC system will take a little longer to get started and probably cannot go as far within the same time period. Progress on the major policy concerns within that period may be largely confined to developing and reaching agreement on what should be accomplished by what date, followed by at least marginal incremental gains in some of the more major areas. Privatization, for example, may have to be limited to experimentation in one Governorate (or several Districts) with only some inputs --probably not fertilizer. It should be clearly understood, that the APCP is only a tool, one of several, to be used in progress toward developing more efficient operational systems for Egyptian agriculture. The entire agriculture portfolio, as well as activities elsewhere in the Mission (and by other donors) must all be considered as elements to be used in making this progress.

B. Project-specific Parameters.

For the APCP, itself, the size and spread of the project will be a function of how fast progress can be made in the various components. The major objective of the technology transfer component should be the institutionalization of an effective process in as many Districts and Governorates as seems reasonable. By the end of APCP 5-6 years hence, the three Governorates currently in SFPP must have this system in place Governorate-wide. The three together contain 156 Village Banks, of which 38 are in SFPP. The project, then, should take on the expansion to the additional 118 Village Banks (a total of 156) involving 30 Districts.

The training and establishment of effective District teams will be the constraining factor in the rapidity of expansion. For the total project over a 5-6 year period, it would seem reasonable to expect to be able to carry this out in approximately 250-300 Village Banks (involving 50-60 Districts). One option would be to select three additional Governorates for APCP that, together with the original three, would cover about that much area. Addition of Gharbiya, Damietta and Beni Suef, for example, would add 18 Districts and 100 Village Banks for a project total of 48 Districts and 256 Village Banks. Various other combinations would be possible that would arrive at about the same level.

However, the GOE has already announced expansion of SFPP activities into eight additional Governorates. Lending activities are already underway using funds made available by PBDAC. Field visits to two locations (and discussions with a Governor of another Governorate) indicate that these activities are presently confined to three Village Banks in one or two Districts in each Governorate. Furthermore the original instructions were to confine the program to only 25 farmers per village. However, farmer interest was so high that several Village Banks went to a level of 60-75 farmers even in the first year and expect to

have at least 100 participants each for the upcoming summer crop season. The implementation of an effective program appears to be mixed, as indicated earlier in this report, depending on the availability of knowledgeable previously-trained Extension leaders. It seems very clear that the BDAC's are interested in expanding the program, but also equally clear that they probably will not expand very far without infusion of additional capital, presumably from a donor.

That being the case it probably would be most expedient to accept expansion to the additional eight Governorates and plan APCP to provide support to this program at as fast a rate as possible. In total these eight Governorates contain 59 Districts with 321 Village Banks. Therefore the recommended option would be to plan to put an effective program into about half of the Districts and Village Banks in each of the eight Governorates during the project life of APCP. This would add about 30 Districts and 160 Village Banks to those in the original three Governorates for a Project total of 60 Districts and about 315 Village Banks. For most effective coverage the selection of Districts within each Governorate should be made so as to include contiguous Districts rather than having them scattered across the Governorate. The easiest way to do this would be to take the southern half, the western half, etc. in each Governorate. In the process attention should also be made to selection of target areas in adjacent Governorates, for example, to pick the southern half of Gharbiya and the northern half of Menoufiya, both of which are adjacent to Kaloubia which would have Governorate-wide coverage. Clearly, not all Districts can be covered at the start of APCP activities. Coverage of additional Districts needs to be phased across the life of the project so that, during the last full year of APCP implementations, all targeted Village Banks can carry out a full program for the year. Obviously, should the estimate of how quickly effective District teams can be established prove too conservative, then the area of coverage could be expanded in the later years.

Based on this scale of effort capitalization of Village Banks could absorb from LE150 million to LE300 million (LE500,000 to LE1 million per VB) for project lending requirements alone. At the rate of \$1.00 = LE1.35 this would require \$110-220 million. An additional \$100-150 million for capitalization could be associated with progress by the GOE in attainment of specific milestones in policy reform. Over a 5-6 year period, assuming satisfactory progress on all fronts, this would provide for obligation of \$40-60 million per year in annual or biennial tranches. Because of the length of time necessary to implement administrative changes in PBDAC procedures and to measure progress in agricultural production, biennial obligations might be the most effective.

Expansion at this rate also assumes that PBDAC will be able to train the staff (mostly Financial Analysts) that would be necessary to carry out their part of project activities concerned with farmer loans. Since these people are already in the PBDAC system and the training program needed has been field-tested under SFPP it should not be too difficult to gear up a training program that could provide trained staff

for the bank in a volume sufficient for expansion requirements across the project's lifetime. Improvement of PBDAC capacity as a financial institution, which would require different types of training, is a further concern that also needs to be addressed per the recommendations in the report of J-J. Deschamps.

C. Technology Transfer Aspects.

The key to organizing, operating and funding this part of APCP is the development of annual programs for each participating Governorate, based on the number of Districts conducting programs for that year. A committee in each Governorate, chaired by the Governorate Under-Secretary of Agriculture, with appropriate representatives from BDAC, ARC, NES, MOI and the Governor's Office would be charged with developing the workplan.

This plan would determine the numbers of SMS's that would be required from ARC and MOI, their specialities and the number of days of service that would be needed, the amount of incentives that would be paid to them and the type and costs of support and backup services (including training) that would be needed from ARC and MOI for the programs of that Governorate. Similarly the plan would spell out the number of Extension staff to be provided by NES as Village Agents and District Extension Supervisors, exclusively for extension activities for the APCP program in that Governorate. With those plans in hand the national levels of ARC and NES could proceed with preparation of their work programs, including the requirements for APCP.

Presumably some sort of Memorandum of Agreement would need to be established between each of the APCP Governorates and the national level offices, spelling out the provision of agreed-on services and procedures for effecting payment from the Governorate level to the national offices. BDAC would serve as the banker in this regard, providing funds on an annual, quarterly or monthly basis from an account fed by a special 1% commission charged for this purpose on all APCP loans. The national offices of ARC, MOI(WRC) and NES would be charged with providing the staff and services specified, including payment of project-provided incentives. Oversight of the services provided, including annual evaluations, would be the responsibility of the Governorate APCP committee. Failure to perform adequately would need to be reported through proper GOE channels, including to the Minister's Office, for consideration and corrective action.

The provision of TA to the project probably should not exceed three LT positions, located at the national level, charged with assisting in making the technology transfer process develop into an effective system. A limited amount of ST TA might also be required to advise on such aspects as effective training programs. No significant amounts of commodities would be needed other than for transportation requirements at the District level and above. For the Village Agents, the establishment

of a revolving loan fund for the purchase of motorcycles is strongly recommended. The VA's should be provided with a motorcycle and with an allowance for fuel and maintenance. They should be required to purchase the cycle over a specified time-period at no interest, with payments perhaps withheld from their incentive pay.

Training costs for the project should largely be paid from project funds, including a fairly generous program of observation training outside of Egypt. There should be little, if any, requirement for LT training. Should limited funds be required at the NES for activities needed to provide necessary support to the Governorate level programs, there should be no problem in providing them directly to NES, provided that justification for these requirements emerges from, and is supported by, the Governorate annual plans and Memoranda of Agreement with NES. It is assumed that national level costs for support to be provided by ARC will be available through NARP. Should this not be the case then funding provided to ARC from APCP would need the same justification as for NES.

D. Cost Estimates for Technology Transfer Commission.

The following table represents the best estimates of a number of GOE staff knowledgeable about the incentives provided by EMCIP, SFPP, etc., combined with estimated requirements for personnel needed to carry out an expanded SFPP-type program.

Incentive Requirements for a Typical District Program

Assumptions:

1. Six Village Banks per District with six village centers (agencies) per Village Bank.
2. Three Village Agents per VB, each with 2 village centers.
3. Two District Supervisors over 18 Village Agents.
4. Twelve SMS's per District, each working 33% time for APCP.
5. Monthly incentive payments of:

Village Agents	LE 25/Mo	Fulltime.
District Supervisors	LE 50/Mo	Fulltime.
SMS	LE 65/Mo	on fulltime basis but working an average of 33% time.

Annual cost for a typical District:

12 SMS x LE65 x .33 x 12 months	= LE 3120
2 DS x LE50 x 1.0 x 12 months	= LE 1200
18 VA x LE25 x 1.0 x 12 months	= LE 5400

Total	LE 9720
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Assuming a VB portfolio of LE 500,000 to 1,000,000 annually for six VB would require a commission of between .20% and .33% to pay these incentives.

Collection of a commission of 1.0% would pay all of the above incentives, plus incentives at the Governorate level and still provide additional funds for national level support costs.

If loan volume rose above projected levels then the commission fund could pay incentives for additional District and Village Extension personnel.

Should it become necessary, in the early stages of starting a program in a particular Governorate, project funds could be used to cover part of the incentive costs until loan volume reached a sufficient level to provide coverage.