APPRAISAL REPORT

AUBURN UNIVERSITY, AQUACULTURE AND AID

OPERATIONS APPRAISAL STAFF
OFFICE OF PROGRAM AND POLICY COORDINATION

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PREFACE

OAS received comments on its draft report on Auburn from the Deputy Administrator, the Development Support Bureau, the Asia Bureau, several offices in PPC, and the Missions in Indonesia and Colombia. Representatives of the Fisheries Office of DSB and Latin America Bureau responded internally and met with the OAS staff to discuss various constructive comments which have been incorporated into the final report. The comments OAS received generally supported the basic conclusions and recommendations of the draft report. However, some minor factual errors were pointed out (and are corrected in this final draft), and certain changes in emphasis were suggested.

Most comments on the report stressed their agreement with the report's conclusions that (1) Auburn was providing an excellent quality of technical assistance overseas at a very reasonable cost to AID; (2) that it has done a good job of using its 211(d) resources from AID to create training capabilities; and (3) that LDC students receive good technical training at Auburn.

The most significant criticisms of the report were:

(1) Projects which were designed before the "New Directions" mandate of 1973 were nevertheless assessed by OAS using the criterion of whether or not they helped the poor majority. This point was raised particularly with regard to the Brazil project begun in 1967.

    It was also maintained that New Directions criteria were unfairly applied to the Colombia project since (1) it is basically a research project, and (2) it is too early to judge whether it would have any broad impact through outreach.

(2) OAS judged Auburn projects by too high a standard, given the fact that they were often designed without the benefit of AID direct-hire fisheries input (e.g., Indonesia), or were criticized when they were carrying out AID instructions.

In regard to the above criticisms, we believe that the draft report qualified its criticisms of the above projects sufficiently by such phrases as "judged by New Directions standards" or by indications in the text that Auburn project designs were the responsibility of AID as well as Auburn. Nonetheless, we have modified the text in various places to give further recognition to these qualifications.

In addition, within the text we have discussed more extensively the pros and cons of certain issues such as conducting graduate field work overseas rather than at Auburn. Finally, since the field research for this project was done in May and June of 1978, there have been some changes affecting some of the country material which require updating of the report, and the final reflects these changes.

The two primary recommendations of the draft report which were not questioned when comments were submitted, and which OAS plans to take follow-up action on in accordance with the Deputy Administrator's memorandum of October 24, 1978, on this subject are:

(1) PPC should complete its present study on the merits of "core" support for non-profit institutions and a decision should be made of AID policy on this issue; and

(2) AID should invest a greater portion of its resources in fisheries development to areas other than pond aquaculture.

EXECUTIVE SUMMARY

Introduction

During the past 12 years Auburn University has received more than $5 million in grants and contracts to carry out research, develop, and implement programs in the field of aquaculture, or fish farming. In addition, on July 25, AID approved a three-year combination contract and special support grant for $1,139,000 for Auburn for the period May 1, 1978 to April 30, 1981, limiting funding to $384,000 for the first year of the grant. The funding for 1978-1979 was obligated in late August and early September of 1978. Although only one year funding was proposed at the time of the request, the Action Memorandum* contemplates that Auburn's services will be needed by the Agency for an indefinite period of time and an element of the grant provides for "core support" to the University so that it can maintain the resources and faculty it developed under its 211(d) grant.

With the exception of the University of Rhode Island, which has received about $2 million in 211(d) grants and contracts, AID's funding in the area of fisheries has been primarily in the field of aquaculture with grants and contracts frequently awarded to Auburn on a sole-source basis. Rhode Island's 211(d) grant expires in September and presently there are no plans to provide additional general or "core" support to Rhode Island.

This spring the Deputy Administrator requested OAS to conduct an overall appraisal of Auburn's programs worldwide. In addition, the scope of the appraisal included the question of whether Auburn's current projects are benefiting the poor majority and the extent to which AID should devote its fisheries resources to aquaculture. Besides visiting Auburn itself, the AID team (which included an experienced fresh water fisheries biologist hired under a PASA) visited active Auburn projects in the Philippines, Indonesia, Brazil, and Colombia and a former Auburn project in El Salvador. The following questions were explored:

1. How well has Auburn performed in training and providing technical assistance in the field?

2. Should AID be devoting the bulk of its fisheries assistance to aquaculture programs, as opposed to assistance to "artisanal" fishermen (i.e., to small scale fishermen employing labor intensive methods to exploit capture fisheries), assistance in reservoir management and commercial fisheries, etc.?

3. How much "core or central support to Auburn is necessary in order for AID missions and regional bureaus to have competent aquaculture assistance available when they need it?

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*Attachment A

4. What is the status, and what should be the future of Auburn projects in Brazil, Colombia, El Salvador, Indonesia and the Philippines?

SUMMARY FINDINGS AND RECOMMENDATIONS

I. How well has Auburn performed?

A. Findings

1. Auburn has done an excellent job of using its 211(d) resources from AID to create a good training capability for the study of aquaculture. It has also built up a good technical staff, many with overseas experience, to train LDC students in both long and short-term courses in aquaculture.

2. LDC students at Auburn receive a high quality of technical training, and many of them are now prepared to take on research training and administrative functions in their home countries.

3. Auburn's long-term technicians in the field are hard-working, dedicated, technically competent, and in most cases adjust very well to the local culture and their counterparts. They are certainly worth the salaries they are paid, which are fairly low as university salaries go.

B. Recommendations

1. AID missions should continue to send students to Auburn for both long and short-term training in aquaculture, including refresher courses. However, because Auburn has had almost a monopoly on AID supported training of LDC students in fisheries, there was general agreement among AID and host country officials (including Auburn graduates and foreign students) that students in fisheries should be trained at other universities in addition to Auburn.

2. LDC fisheries students should receive their basic academic training at U. S. universities but in most cases do their research for their M.S. or Ph.D. dissertation in their home country where the climatic, cultural and other conditions make the research more relevant to projects they will undertake after their training. However, there should be a clear advance understanding that the student will have a free period for research in his home country and the training plan must provide for frequent consultation between the student and his faculty advisor either in the U. S., his home country, or both.

3. AID missions which want to develop aquaculture projects in their countries should continue to consider contracting

with Auburn (as well as other universities) for these services because, at the present time, Auburn has more internationally experienced, technically qualified aquaculturists than any other U. S. institution.

II. Should AID concentrate its fisheries assistance primarily in the area of aquaculture?

A. Findings

1. Only 8% of the fish consumed in the world is cultured, i.e., produced, under controlled conditions. In the non-communist LDC world, according to 1975 FAO data, the figure drops to about 4%. Thus, 96% of the fish consumed by the poor in LDCs are "wild" fish, caught in the ocean, rivers, streams, and lakes. Although aquaculture is admittedly a new science, compared to agriculture, there have not yet been marked increases in the fish protein consumed in LDCs as a result of Auburn's 11 years of effort overseas in this area. More importantly, to the extent fish production has increased by the introduction of fish culture techniques, the increased catch in most cases is not consumed by AID's target group - the poor majority. Furthermore, economic benefits which might inure to the small farmer (i.e., by selling his fish to a wealthier consumer) have also not materialized.

2. Among the very poorest of the poor in many countries are artisanal coastal fishermen who own a little primitive capital equipment and must live from hand to mouth on the basis of each day's catch. Similarly, as far as inland fishing goes, the very poor also lack the land, water or capital resources (including access to credit) to practice aquaculture. This does not, however, imply that the poor majority, as opposed to the poorest of the poor, cannot benefit from the practice of aquaculture in certain circumstances. Nonetheless, a fundamental finding of this appraisal is that aquaculture is only one of the tools which AID should use in its fisheries program.

3. In some areas, where the introduction of new culture techniques has increased production, the farmers have been unable to benefit from the technology, because the initial project design did not take account of the problems of marketing the additional fish. The blame for this cannot be laid entirely at Auburn's door - USAID and AID/W approved these projects and host country statistics or promises were often unreliable. Nonetheless, more fish are of no value in increasing protein consumption or improving incomes if the available markets are saturated or inaccessible.

B. Recommendations

1. AID/W and USAIDs should invest a greater portion of their resources in fisheries development in areas other than pond aquaculture. For example: programs to assist the poor artisanal fishermen (which in cases where waters are overfished, may involve new job training); programs in reservoir management; experiments with such techniques as production in cages or baskets; and research and development of methods to optimize fishing in natural waters. In addition, selected projects in commercial fishing which substantially increase the availability of fish (thus lowering the price and making more protein available) as well as generating employment is also an area which should receive some attention.

2. When designing and carrying out aquaculture projects, both Auburn and USAIDs should focus their efforts more heavily on benefiting the target population - the poor majority - even at the initial demonstration stage by working in areas where poor farmers do have land and water; increasing emphasis on the integration of fish ponds with the total farming activity (e.g., instead of using expensive commercial fertilizers, the farmer uses his own animal manure); designing ponds which can be built by hand labor; guaranteeing the farmer access to needed credit for his initial investment in stock.

3. An economic analysis including a study of the available market for additional new fish produced by culture techniques should be an essential part of the design of any aquaculture project.

III. Does Auburn need core support in order to adequately respond to Mission and Regional requirements in the area of aquaculture?

A. Finding

This raises an Agency-wide issue which goes beyond the scope of this paper - namely the Agency's policy on making "indefinite" commitments to certain institutions and providing them with funds to maintain a staff and facilities which would be ready for immediate short-term response to AID's needs. PPC is working on a study on this basic issue, although the action memorandum on the Auburn 1978-81 core grant states that "PPC endorses the realism of the proposal" for continuing support (Attachment A).

Some pros and cons of central support funding regarding Auburn are briefly laid out below.

B. Recommendation

OAS recommends strongly that PPC (in consultation with interested regional and DSB staff) complete its study as soon as possible on the fundamental issue of "core support" and that a decision be made by the Administrator on Agency-wide policy on this issue. Prompt decision is important in fairness to Auburn and other universities. Auburn was without central funding from AID for almost five months (although the one-year funding of the grant was retroactive) while the issue has remained unresolved. The necessity of completing the study is made more urgent by the fact that a decision on funding for the second year of the grant should be made within the next few months.

Pros and Cons Regarding Central Support* to Auburn

Pros

#1: Auburn states that it cannot afford to maintain its emphasis on international aquaculture if it does not receive continuing central support from AID. The Director of Auburn's International Center for Aquaculture has stated that loss of core support would require him to lose at least six faculty and senior staff members. Those six named include some of the hard-working experienced technicians OAS visited in the field, and are precisely the sort of scientists who would be most desirable if Missions wanted either long or short-term consultants in aquaculture.

#2: AID has invested more than a million dollars in building up the aquaculture capabilities at Auburn. In consequence, at a modest level of incremental investment, AID can realize a high rate of return. This is preferable to letting many of the facilities and equipment revert to the university for its own domestic programs.

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*It should be noted that only part of the $384,000 first-year AID/W grant to Auburn can be considered "core support." $116,000 was obligated for a contract to finance short-term consultants from Auburn to missions who cannot fund these consultants with Mission money. At least another $100,000 can be clearly allocated to services and goods such as a short-term training course for LDC students and the preparation of working manuals with detailed technical information on aquaculture for use in LDCs by teachers, extension workers, PCVs and others.

#3: There is undoubtedly a "esprit de corps" at the Auburn center which is appreciated by LDC students, LDC fisheries officials, the Auburn faculty and staff. The size of the staff, its experience with LDC problems, the easy integration of LDC students into the fisheries program, the personal contacts between Auburn graduates in LDCs and the Auburn staff all make it able to provide good quality practical fisheries training to LDC students. This esprit de corps or "family feeling" would undoubtedly be diminished by a substantial loss of staff (particularly the younger members with the most recent LDC contacts) and the quality of training might suffer.

#4: Providing core support can be compared to paying a legal retainer or having health facilities readily available. One is assured, for a reasonable fee, that prompt expert response capacity is available in a highly technical area. The cost and time of having to seek out that expertise when it is needed might be greater than that of the retainer; furthermore, it might not be available at all when needed and thus, a Mission might have to settle for a less qualified technician.

#5: Finally, while the young technicians who would be released if Auburn did not get the core grant could, because of their competence, undoubtedly find work elsewhere, their personal security and motivation to continue to concentrate in the relatively new area of international fisheries would undoubtedly be enhanced if they were assured of a job for at least two years in advance. This continued effort in the area of LDC fisheries problems would benefit AID in maintaining the resource capacity discussed in Pro #1 above. It would be unfortunate if because of their lack of some job security, they chose to concentrate on research in domestic fisheries problems or another academic area where demand for their services would be more certain.

Cons:

#1: No matter how valuable the Auburn experts are, AID cannot afford to spend its limited resources to keep a "stable" of technicians available on call when they are not rendering any direct service to AID.

#2: Most universities basically operate as "body shops" when they are dealing with "soft" money such as grants or contracts from AID. The Auburn specialists could render the same talent and experience to a USAID, even if a particular fisheries contract were awarded to another university. They could be transferred or given a leave of absence to work for the other university for that particular project.

#3: Auburn does receive overhead of 40% on all its direct contracts with individual USAIDs as well as on any central fisheries contracts or grants from AID for such services as training programs. In addition, individual Mission contracts normally contain provisions for payment for services of a campus coordinator plus some administrative support. The fisheries department also has received grants from private foundations, has contracts with private organizations, receives funds for research from the USDA, and of course receives funds from the State of Alabama. While one can argue (as Auburn does) that the Alabama taxpayer should not be contributing to the support of the development of LDC aquaculture, it is unquestionably true that many of the AID-financed resources (library material, laboratory equipment) benefit the U. S. student studying at Auburn.

Furthermore, the LDC graduate students at Auburn do a great deal of research which is at least as relevant to Alabama fishgrowers as it is to aquaculture problems in their own country. And, of course, although Auburn charges AID centrally for special counseling and other services for LDC students, the LDC students pay regular tuition and fees for their studies, usually financed by AID under PIO/Ps from Mission or Region funds.

#4: If Auburn received "core support" and an "indefinite commitment" from AID, how can AID legitimately deny such support to other institutions which have strong fisheries departments - particularly those institutions which are strong in areas in which Auburn is weak, such as fisheries economics, marine fisheries, etc.? Also, since Auburn now has an established capability, why should AID not consider strengthening other institutions so that it does not have to rely on one source for fisheries expertise? This argument is particularly persuasive in view of our earlier recommendation that AID's fisheries development program support other areas in addition to aquaculture.

In summary, AID's grant and contract assistance to Auburn may be sufficient so that it does not need the additional sweetner of "core support" to be able to adequately respond to AID's aquaculture needs.

IV. Country Specific Observations

Basically, the OAS team felt that the present schedule for phase-out of Auburn programs is correct in the four countries we visited where Auburn is presently operating. A more detailed description of the country programs is attached as Part IV of the basic report.

The major problems encountered (and usually recognized by Auburn and the USAIDs) were:

(1) The aquaculture technology was not reaching AID's target group, but was benefiting the middle and upper classes who owned land, water and had capital or access to it (e.g., brackish-water fisheries project in Iloilo, Philippines; Pentecoste facility in Brazil; Gigante project in Colombia).

(2) Host government extension of the new technology was weak in all countries visited. This is not unique to aquaculture, but there seemed to be a proliferation of bureaucracies and overlapping jurisdictions in host government institutions dealing with fisheries, particularly in the Philippines and Colombia, which exacerbated the general extension problem.

In El Salvador, where we visited a former Auburn project which had been terminated in 1975 because it did not seem to be benefiting the poor majority and because fish were being killed by pesticides, we found a surprisingly thriving aquaculture program being carried out by the Salvadoreans themselves (partially due, no doubt to the fact that one of the assistant Ministers of Agriculture was an Auburn PhD graduate). We felt, and the Mission concurred, that in view of (1) AID's many other commitments in the rural development area, (2) the fact that the BID has made available about $3 million in funds for low interest loans to small fish farmers, and (3) the competence of the Salvadoreans themselves, there was no need to reestablish any long-term AID aquaculture assistance there.

Brazil and Colombia present special problems because AID is presently planning to phase out its programs in these countries in FY 1979 and FY 1980 respectively. The Auburn projects in both countries would seem to be good candidates for reimbursable technical assistance under Section 607, or the governments could purchase technical services directly from Auburn as Nigeria is presently doing.

V. Finally: Partial Success Stories

At least two of the Auburn projects we visited - one at Central Luzon State University - The Freshwater Aquaculture Center (FAC) and the other at Banda Atjeh, North Sumatra in Indonesia - can be considered successful AID projects with one

exception described below. Facilities had been constructed, hard-working technical advisors had transferred technology, production was increasing, and counterparts had been trained and had already or were nearly ready to take over the full responsibilities at the stations. In other words, AID had truly achieved its objective of being temporary, rather than permanent - it had helped people to better their lives and trained them to help others of their country to do the same.

However, our qualification "partial" relates to the finding on page 19 regarding the marketing and distribution of fish. In Banda Atjeh, where production has increased substantially, and could increase even more, the problem of access to available markets has not yet been solved. And, at FAC, extension work has just begun so that only a few members of the target population are practicing the new technology.

INTRODUCTION

Since 1966, Auburn University has received more than $5,000,000 of assistance through grants and contracts from AID in the field of aquaculture.* This includes $1,558,000 in a series of 211(d) grants to help Auburn develop its institutional capacity.

In addition to the centrally funded 211(d) grants Auburn has historically had a series of contracts in at least 15 countries which have been usually funded regionally or by individual USAIDs. Also, AID in cooperation with the Government of Brazil is providing central funding for a Latin American Regional Aquaculture Training Center in northeastern Brazil where Auburn has provided technical assistance for twelve years. New or continuing projects with Auburn are being proposed in at least eight countries for FY 1979.

Since 1974, there have been four audits of Auburn's projects (primarily financial) and no overall evaluation of Auburn's performance, although there have been internal evaluations in connection with the renewal of the 211(d) grants and the extension of individual projects. In most cases, AID support to Auburn has been awarded on a sole source basis. This spring the Deputy Administrator requested OAS to conduct an overall appraisal of Auburn's programs worldwide. In addition, we chose to include in the appraisal questions of whether Auburn's aquaculture projects were benefiting the poor majority in accordance with New Directions guidelines, and whether aquaculture is the area of fisheries to which AID should devote its primary attention.

Because of the technical aspects involved in an appraisal of a field such as aquaculture, OAS obtained the services of a consultant, Bruce Kimsey, a fresh-water fisheries biologist who has worked as a consultant for UNDP and FAO on fisheries projects in LDCs in Latin

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*Aquaculture, for those unfamiliar with the term, can be defined simply as fish farming, or another form of agriculture. Selected species of fish are stocked in fish ponds, the ponds are fertilized, the fish are fed, and at a certain period they are harvested. Predators may or may not be introduced in order to control the growth of the fish and various plant material may also be used to provide for the optimum fish production. In other words, fish like any other crop, are grown in an environment in which the inputs are controlled to the maximum extent possible. This description, of course, is of the most intensive type of aquaculture. Experts may argue that extensive or a more limited form of aquaculture is practiced when only one or some of the above techniques are applied to the cultivation of fish.

America and Africa.* He accompanied an OAS staff officer on the field portion of the appraisal which included visits to seven Auburn project sites in the Philippines (Iloilo, Central Luzon State), Indonesia (Medan, Banda Atjeh), Brazil (Pentecoste), Colombia (Gigante, Repelon) and to the site of a former Auburn project in El Salvador (Santa Cruz Porrillo). The team also interviewed USAID officials in all of the countries visited (except Brazil), consulted with host country officials in fisheries, agriculture, and planning in the same countries, and in numerous cases, met with other donors, both public and private who were investing in fisheries.

Before the field trip, the team, and the Director of OAS spent two days at Auburn inspecting the ponds and research facilities at Auburn's International Center for Aquaculture, talking with the faculty of Auburn's school of fisheries and with LDC students presently studying at Auburn.

Extensive interviews were conducted with all members of the DSB Division of Fisheries staff throughout the preparation of the appraisal; as well as with officers in all the regional bureaus who had experience with fisheries and/or with Auburn. On more general issues, before the trip, OAS consulted with fisheries experts at the World Bank, the UNDP and the Department of Agriculture. Technical texts on fisheries, aquaculture, Auburn's own publications, and internal AID documents such as PIDs, Project Papers, and Contracts were also reviewed.

The Auburn staff was consulted on a regular basis throughout the preparation of the report, and was particularly cooperative in supplying statistics, technical material and other information which was unavailable within AID.

*Kimsey's draft technical notes are not attached to this report but are available for inspection at OAS.

I. Evaluation of Auburn's Performance

Auburn has effectively used its 211(d) funds to create good training and research capabilities in the field of aquaculture. Its long-term technicians serving in the field under USAID contracts are excellent, and it has provided very good training in fisheries to LDC students.

A. Long-Term Technicians

The OAS team found the Auburn technicians working in the countries which we visited to be dedicated, conscientious, hard-working, and in most cases, well adapted to the culture and on excellent terms with their counterparts. With the exception of the Chief of Party in the Philippines, who was hired by Auburn on a PASA from the Fish and Wild Life Service and who had an office in the USAID mission, all were men in their 30s. All had MS degrees, most had PhDs or had finished all of their work toward their PhD except their thesis. Most had been Peace Corps Volunteers (frequently in the country in which they were working for Auburn); and all had good to excellent language capability, except in countries where English was widely used because there were a variety of local languages.

We also received reports from counterparts and host government officials about these and former Auburn technicians. Although a few were termed "arrogant" or accused of "pushing too hard," the reaction was generally positive. Furthermore, they worked long hours in remote places, enjoyed stable family lives, and in most cases were well integrated into the local culture.

The fisheries biologist assigned to the team felt that all were above average in technical competence in fisheries generally, as well as experts in aquaculture.

In view of the salaries they were receiving, $14-$20,000 approximately, we felt that AID was getting excellent relevant technical assistance at bargain basement prices.

B. Short-Term Consultants

The work of Auburn short-term consultants appears to have been helpful although (1) we did not have an opportunity to observe these personnel in action; and (2) some of their visits appear to be for the purpose of generating new projects for Auburn.

On the whole, host country and USAID officials felt that the visits of these consultants had been useful, particularly when they conducted short courses on such subjects as extension work. The consultants were respected for their hard work; many renewed contacts with former students; and they usually arrived on schedule, often on short notice in response to USAID or host country requests.

The short-term consultants were almost always senior to the long-term technicians in the field. Some of them had had previous long-term experience overseas, and their age, experience and academic credentials commanded respect from host government officials.

On the other hand, that same seniority resulted in a few complaints that they were interfering unduly in what should be host countries' decisions. In addition, occasional questions were raised about whether these AID-financed consultant trips were for the purpose of research for publications to help the consultant's professional career, and whether they were sometimes simply to generate enthusiasm for new or extended projects with Auburn.

C. Training

At least ten years prior to AID's first grant to Auburn for work in aquaculture, the head of the fisheries department at Auburn, Dr. Swingle, visited India (which has a centuries long tradition of aquaculture) and became convinced of the importance of aquaculture in solving the food shortage in developing countries. Contacts with aquaculturists in LDCs were established prior to AID assistance to Auburn. With AID funds under the 211(d) grant, Auburn established the International Center for Aquaculture, offering special training and counseling for LDC students, and eventually becoming a "Mecca" for LDC fisheries officials and scientists visiting in the United States.

LDC students trained at Auburn returned home infused with "Swinglism" - the message that aquaculture was the hope for increased protein consumption in their poor countries. These students also received good basic scientific training in warm-water fisheries biology and they learned fundamental research skills. They also participated in the research and development of sophisticated techniques such as mono-sex tilapia culture.* The

*Mono-sex culture is a method by which all male hybrid progeny are obtained from a female Tilapia nilotica and male Tilapia hornurum These hybrid grow more rapidly to a larger size then either of the parent stocks. In addition, stunting caused by overpopulation which is characteristic of normal tilapia populations is avoided since no reproduction can occur.

advantage of mono-sex culture is that by making more efficient use of pond and food resources, larger fish are produced in a shorter time -- thus increasing the amount of available protein.

In the view of the fisheries biologist assigned to the OAS team, the quality of Auburn training in fisheries was good, and in aquaculture, it was excellent. The Auburn-trained LDC scientists we visited in the field were highly qualified, compared to their locally trained counterparts; and they were in many cases truly able to replace the Auburn technical advisors who had been working in the host country during their absence.

Auburn's short-term courses have been excellent also - not only in introducing LDC students to good aquaculture facilities - ponds, sophisticated laboratory equipment, and library materials, but also in providing the LDC students with an environment in which they are welcomed and easily accepted. The value of the exchange between Auburn staff who have served in the field and identified promising LDC students who studied at Auburn and then returned to become fisheries officials in their own countries who in turn return to Auburn for further training or send their own proteges there cannot be quantified. However, whether it is an initial short-term course, a refresher course for a former LDC Auburn student, or short-term course given by Auburn in the field - there is no question that the mutual personal contacts make Auburn a superior training institution in fisheries.

Training at Other Universities

On the other hand, there is almost general agreement among the persons interviewed by the OAS team (including LDC students studying at Auburn presently and returned Auburn graduates now working in LDCs) that LDC fisheries students should be trained at other U. S. institutions in addition to Auburn.

Two arguments can be advanced in favor of training in fisheries at universities other than Auburn:

(1) Auburn's strength is in research in fresh warm-water aquaculture. It has recognized itself that it has weaknesses in economics, marine fisheries, and other areas which are of equal importance to solving LDC fish problems.

(2) In the aquaculture research area, Auburn is further limited by the fact that it is in a temperate zone and cannot provide conditions comparable to those found in the tropical waters where most LDC fishing projects are carried out. For

example, tilapia, the species of tropical fish for which Auburn is best known for improving and introducing in LDCs, can only be grown outdoors in Auburn six months of the year and other climatic conditions at Auburn are not comparable to those in the tropical LDCs. Similary, Auburn has no tropical brackish water facilities, and a number of AID's aquaculture projects overseas involve research in the production of milk fish, a brackish water fish.

For these reasons it would be desirable if some research could be conducted at universities which have water or climates more closely equivalent to those found in the LDCs where the fish will be cultured.

Training in the Field

Related to the above problem is the fact that students trained at Auburn often do their M.S. and Ph.D. dissertations on subjects which are not of direct relevance to the research and extension activity they will be carrying out in their own country. Because of the climatic and water conditions discussed above, frequently they cannot work with the same species which they would be working with at home.

A partial remedy for this problem is for students to receive their basic academic training in the United States and do the research for their M.S. or Ph.D. dissertation in the field. This idea was heartily endorsed by most of the students, former Auburn graduates, Auburn technicians and LDC officials with whom we spoke.

OAS recommends that this be the future training policy for fisheries students receiving U. S. training in most cases, subject to the following conditions:

(1) There must be a firm written agreement with the host government that the student is to be given a free period for research. Too frequently, a returning LDC graduate student is immediately deluged with operational and bureaucratic responsibilities, and does not have the time to do the technically precise research required for an accredited U. S. university to award him a higher degree.

(2) Arrangements must be made in the training plan for the student to regularly visit the U. S. to consult his faculty advisor or for the advisor to visit the student to be assured that the research is being carried out correctly. Measures must be taken to insure that the research is carried by the student

himself and not by his employees. While additional travel providing for this supervision and control would involve costs which would be paid by AID, we believe the benefits of relevant, applied research in the specific environment in which the student will be working far outweigh these costs.

The question of graduate students conducting their dissertation research in their home countries is not a new idea within the Agency. Presently, the National Association for Foreign Student Affairs, under contract with OIT, is doing research on the "practices and experiences" of 93 graduate schools with this problem so that OIT can make some general recommendations on the subject in 1979. However, while awaiting the outcome of this report and OIT's recommendations, OAS still believes that, subject to the above conditions, more fisheries research should be carried on within the student's home country.

II. Aquaculture Is Not the Only Answer

Auburn has consistently maintained that the promotion of aquaculture is the primary way to increase animal protein consumption in the less developed countries and that Auburn is the premier authority on providing technical assistance in international aquaculture. In regard to the second assertion, Auburn is probably correct -- due partially to AID's support, which has allowed it to develop its training facilities and to hire experienced staff over the past twelve years. However, in regard to the assertion that aquaculture is the primary way to solve the problems of the protein deficiencies in LDCs, a number of questions can be raised.

Leaving aside for a moment the larger issue of whether assistance in the areas of fisheries is more likely to solve the LDC protein problem than assistance in increased grain and legumes production or assistance in other forms of animal protein, it is clear that AID's options in fisheries assistance are not limited to aquaculture. More than 96% of the fish consumed in the non-communist less-developed world is not cultivated in fish ponds, but is caught in the ocean or in rivers, streams, lakes or natural ponds. An overemphasis on aquaculture neglects the immediate problems of the poorest of the poor because aquaculture produces so little of the protein they consume.

Alternative areas of fisheries in which AID can and should devote some of its fisheries resources are water engineering, fish population dynamics, the management of both natural and artificial impoundments all with an aim toward achieving the optimal yield of "wild" fish. Auburn in fact is carrying out some of this research and work (particularly in Brazil and in the Llanos project in Colombia), but its primary emphasis is on aquaculture.

In addition, in certain circumstances, assistance to commercial fisheries projects may benefit the target group more immediately by generating employment and by increasing the fish caught, which should decrease the price of fish and increase protein consumption.

The Auburn argument against these other approaches is that the most sophisticated research and investment in capture fisheries has barely increased the tonnage of fish caught world-wide during the past twenty years, while the potential for tripling, quadrupling or even greater multiplication of production through aquaculture is possible. Furthermore, aquaculture advocates argue, research and development of aquaculture offers a primary

solution to the world food problem. It is too early to judge aquaculture yet, they argue, because we are basically hunters in regard to fish -- if we are to survive, the human race must make the great step forward as it did thousands of years ago in agriculture, when it settled down to cultivate and harvest rather than to simply capture and collect.

Without quarreling with the importance of aquaculture -- in fact, while endorsing AID's continued support of aquaculture projects, we recommend the use of AID's resources in other areas of fisheries development also, particularly those which are likely to have more immediate direct benefit to the poor.

III. Should Auburn Receive Core Support on an Indefinite Basis?

As the Executive Summary (p. 4) notes, this raises an Agency-wide policy issue which goes beyond the scope of this report. Within the Executive Summary, there is a brief summary of the arguments that have and can be advanced in favor of and against core support to Auburn.

The Action Memorandum of July 25, 1978 approving the Auburn contract and grant appears to have made a decision in favor of "core" support on an indefinite basis (Attachment A). However, because there are so many qualifications attached to the decision, because the study on the Agency-wide issue has not yet been completed, and because the funding commitment is for only one year, we believe that the matter of core support should be more firmly clarified, in regard to both Auburn and to other institutions.

IV. Country Findings

1. Philippines

Auburn projects in the Philippines have been generally successful in terms of transferring technology and training. The Mission's decision to phase out the assistance at the Brackfish Water Aquaculture Center (BAC) indicates that external aid is no longer necessary there. The Center is well-equipped, the ponds are in good condition and, most importantly, well-trained staff from Auburn have returned to assume the responsibilities of research, teaching, and extension training which are necessary to operate the Center. There are a number of technical problems connected with the station ponds, but it is our assessment that the current Filipino staff is capable of dealing with them and that they can obtain sufficient financial resources from the GOP for this purpose. Obtaining these resources is particularly likely to be facilitated because of an arrangement between BAC and the Aquaculture Department of SEAFDEC,* an international institution located near BAC, devoted to research and training in fisheries in South East Asia. Under this arrangement, BAC staff members serve on the faculty of SEAFDEC's Aquaculture Department and vice versa and they have joint use of each other's laboratories and library facilities.

Similarly, the Auburn trained graduates who are managing the Fresh Water Aquaculture Center (FAC) in Central Luzon University and teaching in the College of Fisheries there, are well-equipped to handle research training and extension work. The primary problem facing these Auburn graduates is that there are many conflicting demands being made upon their time because of the publicity that the FAC Station has received, and because their presence is in great demand at fisheries conferences both in the Philippines and in other LDCs. At the same time, because the Minister of Agriculture of the Philippines has announced a "Blue Revolution"** (endorsed by President Marcos), and great publicity has been given to the possibility of rice fish culture, they are under considerable pressure to come up with some quick research results on pesticides which can safely be used in rice fields where tilapia is introduced.

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* South East Asian Fisheries Development Center.

**The "Blue Revolution" has been proclaimed as an experiment comparable to the "Green" Revolution - an enormous increase in fish production to be achieved through the development of various new technologies including advances in aquaculture.

Nonetheless, the LDC technicians seem quite capable of handling the FAC without additional external assistance except perhaps on a short-term basis. In fact, they prefer to do so and indicated that they wanted a veto power over any advisors who were sent to help them, because they mentioned a past experience in which USAID "forced a technician down their throat" by suggesting that their preferred advisor was not available, and that they had to take USAID's candidate or have no assistance at all.

At the time of our visit, a PP was being considered to provide a technical advisor for one year to assist in the construction of a hatchery at FAC. There is no question that such a hatchery is needed; however, it is not clear (1) that the services of a full-time expatriate technical advisor are needed, and (2) that if so, that that advisor should necessarily come from Auburn, since capacity in hatchery design and construction exists at many universities and in private industry. Some members of the Mission did indicate, however, a preference to award such a contract to Auburn on a sole source basis. Since awarded to another university.

Thus, in summary, the two Auburn projects in the Philippines basically have been AID success stories and, as should be the case with most AID projects (but regrettably so frequently is not), have come or are coming to a graceful end. The original technical assistance was provided, the host country personnel were trained, and now can carry on on their own without the need for further sustained aid.

One additional factor affecting fisheries in the Philippines should be mentioned. There is a plethora of institutions dealing with fisheries in the country, some private, some public, and some international. Within the Government itself, several ministries themselves have jurisdiction over various aspects of fisheries. Perhaps the element within the Government which most needs strengthening is BIFAR, the arm of the Government which is primarily responsible for extending new aspects of fisheries technology.

In an earlier portion of its contract with USAID/ Philippines, Auburn did provide an advisor who helped strengthen BIFAR to some extent. This is one of the roles which is presently being carried on between the current Auburn/USAID fisheries advisor in Manila, who actually operates almost as a member of the USAID staff, and in a job which he realizes is important in the future of Philippines fisheries development.

The Auburn contract has been extended through January, 1979 to permit this Auburn advisor (who himself is on a PASA from the Fish and Wildlife Service) to remain in Manila.

2. Indonesia

The project was originally designed to increase the production of milk fish in northern Sumatra in the two provinces of Banda Atjeh and Medan. However, because the distance between the two sets of project sites is so great (9-14 hours by 4-wheel vehicle) and a separate technician is responsible for each province, they are frequently considered by AID as two distinct projects. The project has succeeded far beyond its stated objectives in Banda Atjeh but in June 1978 had hardly gotten off the ground in Medan. This is due to a number of factors, partially attributable to AID and partially attributable to the Auburn team who participated in the original project design.

In the province of Banda Atjeh, the people have traditionally practiced the culturing of milk fish in small ponds, and the introduction of fertilizer, fish food and certain other modern techniques by the Auburn technician quickly resulted in a substantial increase in yield. Furthermore, this project benefited the target population because, unlike the Philippines, the average owner of a milk fish pond is a poor to middle-class person usually owning 5 hectares or less of land.

In Medan, on the other hand, the practice of milk fish culture had never been very extensive, and when the Auburn project began, many technical difficulties were encountered in the construction of demonstration ponds. As of the time of our visit in early June, almost three years after the signature of the project agreement, only one of the three demonstration pond stations had been completed and none had been stocked. As a consequence, the project has been extended for another year. While the Auburn technician has hopes that the technical problems can be resolved, we question whether the practice of milk fish culture will ever be widely adopted in Medan by the target group because of the capital required to overcome the difficulties in pond excavation, the difficulties in establishing title to the land, and the fact that fingerlings are not available in the ocean of Medan but must be transported from Banda Atjeh.

As stated earlier, it is difficult to assess whether Auburn, USAID/Indonesia or AID/Washington bears the responsibility for this project's delay and possible failure. Most probably, the responsibility is joint. The Auburn team's project design

visit was brief; they relied heavily upon statistics given to them by GOI officials which are generally agreed to be unreliable; and they may well have assumed that because of the proximity of Banda Atjeh that the situation in both provinces was similar. There was clearly some pressure from the GOI to locate a project in Medan. However, the Mission in Indonesia and AID/Washington approved the project with few reservations, suggesting an undue reliance on the Auburn recommendations on their part.

We believe that either the Mission or the Auburn team should have been able to ascertain by simple observation within a short period of time that the people of Medan had tried and abandoned milk fish production, probably because of difficulties in obtaining fry locally and the soils and elevation problems. However, under the present circumstances, we understand the decision to extend the project for another year considering the investment that has been made in the partially completed demonstration ponds and the amount of time required to complete and stock them. We would not recommend a further extension in Medan, however.

Earlier in the discussion of the Banda Atjeh portion of the project, we stated that the project's goals had been exceeded in terms of production. However, notwithstanding this success, the Banda Atjeh project has not begun to realize its true potential, due again to inadequate project design which was probably both the fault of Auburn and AID. Milk fish production has increased substantially in Banda Atjeh. In fact, it has increased to the point that the market is saturated. Production could be doubled or tripled, however, and the farmers could receive major increases in cash income if it were possible to transport the fish economically from Banda Atjeh to Java where the demand and price for milk fish are both high.

In planning the project, Auburn neglected to fully explore the marketing problem, assuming the increased production would be absorbed by the local market. USAID and AID/Washington also approved the project without raising questions in this regard. As a consequence, the farmers in Banda Atjeh who have adopted the new fish culture techniques are not realizing nearly the full potential from the project because there is not yet a way to economically transport the fish to Java.

Both the Indonesia Bureau of Fisheries at the national and local level and USAID are now well aware of the problem and various measures for solving it are under consideration. We have urged USAID to proceed vigorously with the Bureau of

Fisheries at the national level and trust that some success in resolving this problem will be imminent.

3. Brazil

The Auburn project at the Pentecoste Station in Fortaleza in northeastern Brazil was Auburn's first AID-supported venture into fisheries overseas. In some ways, it has proven immensely successful. It cannot, however, be considered successful if it is judged by New Directions standards which were legislated in 1973, after the project was well underway.

Tilapia, a previously unknown species, was introduced and cultured at the Pentecoste Station; 12 local fish farmers adopted the fish culture techniques demonstrated at the Station by Auburn technicians and began successfully growing large numbers of tilapia for the local market. In addition, the largest and most sophisticated aquaculture facilities in Latin America were constructed with the advice of Auburn technicians and with substantial financial contributions by the Government of Brazil. Furthermore, an international training center in fish culture has been established at Pentecosts with new facilities and ponds almost completed, and with courses in fish culture being given to students from numerous countries in the western hemisphere.

However, in terms of providing more protein for the malnourished, desperately poor people of northeast Brazil, little has changed. The price of fish in real terms (even after inflation) has remained constant or risen. Tilapia production is also far beyond the reach of the average poor person in northeastern Brazil since he usually has no land on which to build a fish pond, no capital with which to build it, and no access to credit with which to obtain the capital. Thus, the sophisticated aquaculture techniques which are benefiting only 12 or 13 large land owners in this area do not help him.

This situation has been recognized by Auburn for sometime in its annual reports on the Brazil project but there has always been the hope that the situation would change. Our observations and conversations and indeed the most recent Auburn report on the Brazil project indicate that such change is not likely. Until the Government of Brazil decides to undertake substantial reforms in making land and credit available to the rural poor, the opportunity to practice aquaculture is simply beyond their grasp. Furthermore, since AID has phased out its program of assistance to Brazil, we have little if any leverage to convince the GOB to make such reforms. Under these

circumstances, we can see no justification for continuing the project. Since the issuance of the draft report, AID has decided to terminate assistance to the project.

The one aspect of the Brazil project which has had some impact on the rural poor has been the greatly improved quality of reservoir fisheries management. Fish stocks are controlled and careful records are kept so that the reservoirs are not over-fished. The fishermen who are licensed to fish in the reservoirs do appear to be poorer than the large pond owners who practice aquaculture, although it is impossible to get any kind of fix on what their total average income is since they usually farm or engage in some other form of employment besides fishing. Furthermore, because they sell to middlemen who mark up the fish almost 100% and who then pass the price of fish on to the consumer in the market place at an even higher price, the cost of fish in Brazil has not dropped in the past decade. With the exception of the few people who work on the large fish farms, the only increase in protein consumption for the rural poor in northeastern Brazil is probably by the fishermen themselves who do not sell all of their catch and the unlicensed fishermen who take about an estimated 15%-20% of the total catch from the reservoirs thus benefiting themselves and their families.

4. Colombia

The project in Colombia was begun under loan number AID-DLC 1p 2086 signed on December 24, 1975. The actual project did not get underway until early 1977 when three Auburn technicians arrived on the scene. The project itself consists of the construction of a station at Gigante in the southern part of Colombia; the construction of additional facilities, laboratories and ponds at Repelon on the northern coast of Colombia (where FAO had previously provided technical assistance to a small research station); and a research project in the Llanos region of Colombia involving a study of artisanal fishermen on the upper Meta River.

A summary impression of the Colombia projects (with the possible exception of the Llanos project) is that they resembled the Fortaleza project in Brazil 10 years ago. In other words, an existing research station was being expanded, with the hopes of attracting students in aquaculture from other parts of Latin America, and aquaculture demonstration practices were being carried out on large and middle-size farms in the area around Gigante. In neither case had there been any demonstrable effect upon the small farmer; nor was there any indication that such effect was likely to occur within the next two years.

In Repelon, as at the training center at Pentecoste, a primary emphasis is on the construction of laboratories and facilities which will be the pride of Latin America in terms of research and experimentation with tilapia and with other varieties of fish which are unique to Colombia. In Gigante, the present approach is to try to interest a few relatively wealthy and innovative land owners in trying out the new techniques of aquaculture in the hopes that they might begin to practice it for profit.

At the present time, at Gigante the Auburn technicians are simply using local privately owned ponds for demonstration purposes and none of the farmers are practicing aquaculture in the sense of purchasing their own inputs. In all fairness, this is due to the fact that the demonstration ponds and research facilities at Gigante are only in the initial construction stages. Best estimates indicate that the entire station will be completed no earlier than February 1979.

Like the Philippines, Colombia suffers from the fact that there are many bureaucracies which are interested in fisheries and that some of these bureaucracies are exerting pressure on USAID and the GOC to provide extension work before basic applied research in Colombia waters is completed. On the other hand, Colombia differs from any of the countries that we visited in that it has a long tradition of protection of its natural resources. Two simple examples are illustrative of this environmental concern: (1) Despite the strong technical advice of Auburn and INDERENA (the Colombia Government agency charged with the protection of natural resources, including fisheries), the GOC decided not to allow the introduction of Tilapia nilotica, a fish which has proven extremely successful in fish culture in Brazil and in southeast Asia because of fear of the effect that introduction of an alien fish might have on native species;* and (2) in the Government extension fishery stations all over Colombia, signs have been posted (albeit vintage 1960s) admonishing fishermen to conserve their natural resources, to throw back fish that are undersize, and in general to protect the bounty with which nature has endowed them.

As with BIFAR in the Philippines, INDERENA in Colombia is a comparatively weak institution within the total

*The Auburn technicians have indicated they hope to persuade the GOC to permit the introduction of the new species.

government bureaucracy. There were frequent complaints by INDERENA workers in the field, USAID advisors and the Auburn technicians about the slowness with which INDERENA provided them with their basic budget requirements, about the delays in the construction of facilities, as well as disagreements between Auburn and INDERENA about the number of vehicles to be supplied both to the project and for extension work.

Earlier, we stated that the Gigante and Repelon projects appeared to be similar to the Brazil project ten years ago, i.e., concentrating primarily on research and outreach to large and middle income farmers outside the target population. Two defenses were offered to this observation: (1) research is essential before extension can be done, because farmers are simply turned off if ineffective extension materials are presented to them because the research is sloppy and hastily done; and (2) the novel but interesting suggestion that the truly rural poor are benefiting by the work of the larger farmers in fisheries because they frequently poach from the experimental fish ponds.

At the present time, the USAID program in Colombia is is in a phase-out state, and all Auburn technicians will leave by early 1980.

5. El Salvador

An Auburn aquaculture project in El Salvador was terminated in 1975 by the Mission on the basis of an economic study which showed that aquaculture did not and was not likely to benefit the poor majority. USAID has not reinstituted a fisheries program and has indicated that it has no intention of doing so, partially because it only has three positions in the Agriculture and Rural Development Office (at the time of our visit, two of those positions were unfilled) and the Mission wishes to carry out a number of ambitious rural development and agricultural projects in other fields. However, partially because of Auburn's original work in the aquaculture area in Salvador and because one of the Assistant Ministers of Agriculture is an Auburn PhD. graduate, the Salvadorean Government appears to be fairly well-committed to the development of fisheries. There is a sizable allocation in the development budget for fisheries and the development of aquaculture is included in the current Salvador development plan.

Jose Cabrero, the Assistant Minister mentioned above, wishes to bring his former teacher of fisheries at Auburn to Salvador for a short-term consultancy. The Mission has raised no objection to this, although there was

no funding for the trip because Auburn's core contract with AID/W had not been signed at the time of our visit.

Our visits to the Salvador facilities show that they have a well-developed aquaculture center at Santa Cruz Parillo and are carrying on some research and have a certain number of well-managed fish ponds, both private and communal. Salvador officials acknowledge pesticide is still a problem (i.e., research cannot be carried on at their major station during certain months of the year because it is near cotton plantations). However, at the time of our visit, tilapia were being grown, harvested, and sold.

Resources for the development of aquaculture are available in the form of a $5.3 million BID loan, which is also for the development of marine fisheries but which also permits lending for up to 5,000 hectares of inland fish ponds. The loan agreement provides that the funds will be reloaned by the Government of Salvador to a rural credit bank which will then reloan to individual borrowers. According to the BID representative, this bank has a good history of lending to small farmers and the terms of the loan agreement provide that loans can be made for as little as $300. Also, it is possible that there will be some Canadian assistance to the Salvador Government in the area of fisheries as well. Thus, if small farmers do want to practice aquaculture in Salvador, the resources and the technical know-how are available and there would seem to be no need for AID intervention in this area except possibly in the form of short-term consultants. Therefore, we concur with the Mission's present intention not to commence another aquaculture project in Salvador.

Jul 14 9 56 AM '78

ATTACHMENT A

ACTING DEPUTY
ACTION MEMORANDUM FOR THE ADMINISTRATOR

APR 20 1978

THRU: ES

FROM: AA/PPC, Alexander Shakow

Problem: Your guidance is requested prior to AA/DS authorization of a new project to finance aquaculture training and advisory services from Auburn University.

Discussion: Sandy Levin and I want to highlight for your attention one aspect of the DSB aquaculture proposal with Auburn University. There is general agreement that Auburn University's services are important to the Agency and that their past performance has been good. DSB is proposing a core financing relationship which could continue to assure Auburn's services as long as required by the Agency and subject to Auburn's continued good performance. All four Regional Bureaus concur.

Over the years, the Agency has retained the services of universities through a variety of contractual instruments such as Basic Ordering Agreements, Cooperative Agreements and services contracts. We have made these arrangements in the context of time-limited projects; we have been reluctant to acknowledge that we anticipate continuing need for such services. As a result, the scopes of work and the negotiation for services have been distorted by the false notion that at the end of the project period core financing of the services would no longer be needed; somehow non-profit institutions would be able to finance this infrastructure in anticipation of business from AID and other organizations.

This proposal is more realistic; it says we anticipate need for Auburn's services indefinitely, assuming continued demand from the Missions and good performance by Auburn. DSB hopes to negotiate a tight budget for a core staff which will provide graduate-level training for LDC aquaculture experts over the next three years. The Auburn faculty will also be available for consulting at the request of Missions. During the next year, DSB hopes to have in place a quick, responsive mechanism for charging consulting directly to Missions. At the end of the three year period, if the demand for services continues and we are satisfied with Auburn's performance, we would renew the support of core staff for specified tasks at a funding level just sufficient to retain the capacity at Auburn.

PPC endorses the realism of this proposal. You should be aware that there are other universities providing services which will be needed indefinitely by the Agency. It is anticipated that AID will conclude an unknown but probably substantial number of similar arrangements with U. S. universities over the next year to eighteen months. Approval of this financial arrangement with Auburn would, in effect, be a policy decision approving the development of similar arrangements with other U. S. universities as appropriate.

Bob Nooter has requested PPC/OAS to take a look at AID-financed Auburn programs; OAS suggests (see Tab A) that one year financing of this new project might be appropriate pending the completion of the appraisal. DSB, in response, notes that there have been two short-term extensions of the expiring 211(d) grant over the past year for AID's convenience while the Agency has wrestled with the knotty problem of long-term core financing. This type of relationship is both expensive and frustrating for the university. Nonetheless, DSB recognizes Don's point, and has redrafted the PAF to authorize a three year grant period but one-year financing. The final two years of the grant would be subject to an Agency appraisal of AID-financed Auburn programs. We hope this will permit Auburn to proceed on the assumption of a continuing relationship with AID while retaining flexibility for modification in that relationship for the second year if required.

Recommendation: That you approve in principle the DSB proposal for aquaculture training and advisory services from Auburn with the understanding that your approval and Assistant Administrator Levin's authorization of the project will constitute a precedent for additional such activities when appropriate.

Att: TAB A, Memo dtd 4/4/78 frm D. Finberg to S. Levin
TAB B, PAF, Part II

Approved: [signature]
(Acting Deputy Administrat

Disapproved: _____

Date: 7/4/78