(7-71)

PIO/T

DEPARTMENT OF STATE
AGENCY FOR
INTERNATIONAL DEVELOPMENT

PROJECT IMPLEMENTATION ORDER/TECHNICAL SERVICES

Worldwide

1. [redacted]

2. PIO/T No. [redacted]

3. ☐ Original or Amendment No. ____

4. Project/Activity No. and Title
Asian Vegetable Research and Development Center (AVRDC)

PD-AAO-945

4980212(5) 15p

DISTRIBUTION

5. Appropriation Symbol

6.A. Allotment Symbol and Charge

6.B. Funds Allotted to: ☐ A.I.D./W ☐ Mission

7. Obligation Status
☒ Administrative Reservation ☐ Implementing Document

8. Funding Period (Mo., Day, Yr.)
From 1/1/76 To 12/31/76

9.A. Services to Start (Mo., Day, Yr.)
Between 1/1/76 and 1/2/76

9.B. Completion date of Services (Mo., Day, Yr.)
12/31/76

10.A. Type of Action
☐ A.I.D. Contract ☐ Cooperating Country Contract ☐ Participating Agency Service Agreement ☒ Other Grant Agreement

10.B. Authorized Agent
AID/W

Estimated Financing $1.00=		(1) Previous Total	(2) Increase	(3) Decrease	(4) Total to Date
11. Maximum A.I.D. Financing	A. Dollars		600,000		600,000
	B. U.S.-Owned Local Currency				
12. Cooperating Country Contributions	A. Counterpart				
	B. Other				

13. Mission References

14. Instructions to Authorized Agent

The Contract Office is requested to execute a grant agreement between AID and the Asian Vegetable Research and Development Center. The program to be undertaken is described in Attachment A. Funds provided herein will be used to support AVRDC's core operation budget only.

Special provisions are included in Attachment B.

[redacted]

15. Clearances – Show Office Symbol, Signature and Date for all Necessary Clearances.

A. The specifications in the scope of work are technically adequate
TA/AGR: GBaird Date: 10/2/75

B. Funds for the services requested are available
TA/PPU: CIolfetto Date:

C. The scope of work lies within the purview of the initiating and approved Agency Programs
TA/AGR: LHesser Date: 10/3/75

D.
TA/PPU: MMozynski Date:

E.
TA/AGR: RHolmes Date: 9/3/75

F.
EA/TD: FRiggs Date: 10/6/7

16. For the cooperating country: The terms and conditions set forth herein are hereby agreed to
Signature and date:
Title:

17. For the Agency for International Development
Signature:
Title:

18. Date of Signatur

GPO 867-

ATTACHMENT A

Program Proposal
Asian Vegetable Research and Development Center (AVRDC)
January 1, 1976 - December 31, 1976

A. Objective

It is the objective of AVRDC to increase the yield potential and nutritional value of selected crops that are especially useful in supplementing the rice diet and diversifying the year-round activities of rice farmers in tropical and sub-tropical Asia. Furthermore, the crops being worked on, because of their adaptability to upland soils and their demand in the market, give promise of higher income, as well as improved nutrition, for the Asian small farmer who often depends almost entirely on rice for his income and food.

B. Research Program

As rice will still be the staple food for monsoon Asia, the crops that AVRDC is working on will be improved primarily as produce to be grown in conjunction with that grain. From among the more than 100 different crops that authorities class as vegetable, AVRDC carefully selected 6 for early major attention. They are the mungbean, *Vigna radiata* (Syn. with Phaseolus aureus); the soybean, *Glycine max*; the tomato, *Lycopersicon esculentum*; the sweet potato, *Ipomoea batatas*; the Irish potato, *Solanum tuberosum*; the Chinese cabbage, *Brassica pekinensis*.

Many consider (and rightfully so) that the vegetable crops as a whole cannot play a major role in solving the world food problem. However, that the six crops which AVRDC is emphasizing include two important food legumes, the mungbean and the soybean. They can be readily stored, are high in protein, yet yields with present varieties are deplorably low under tropical and sub-tropical conditions. Also included are two important root crops, which when further improved can contribute even more toward feeding the people of the tropics, especially under soil, topographic and climatic conditions not too favorable for rice production.

As will be pointed out later, there were good reasons for including the tomato and Chinese cabbage also.

More specifically the bases for selecting these six crops are as follows:

The mungbean is an ancient and well-known leguminous crop of Asia. It is grown on over 2 million hectares in South and Southeast Asia. It is

an excellent source of protein and is eaten in many forms, including bean sprouts, green beans, boiled dry beans and noodles. The mungbean has never received the kind of research attention that has been directed to most other important food crops. Yet, through a concentrated large-scale research program, its yield potential, now only about 1.5 metric tons per hectare, might well be doubled. This would be achieved by breeding varieties that not only make more efficient use of solar energy and soil nutrients but that are more resistant to insect and disease attack.

The soybean is a major world crop particularly in the U.S.A., Brazil and China. However, varieties suitable for the Asian tropics have never been developed. Those Asian countries (such as Japan and Taiwan) sufficiently affluent to support a large domestic animal population import huge quantities of soybeans. Given varieties better adapted to tropical conditions, the soybean could well become an important export crop for the less-developed countries of the tropics and sub-tropics, and a high protein crop for local use as well.

Many of the present varieties of soybeans are unsuitable for the tropics because of sensitivity to short days and to high temperatures. It is AVRDC's objective to collect the world's soybean germ plasm and to develop improved varieties that have not only tolerance to tropical climates, but also greater resistance to insects and diseases.

The tomato is a popular crop almost everywhere. It is an excellent source of Vitamins A and C and is an important cash crop for small farmers in Asia. Also tomato processing and canning factories, particularly in the Philippines, Thailand and Taiwan, provide important employment in rural areas and a good market for the small farmer. Unfortunately, in the tropics the tomato is beset by many handicaps, principally those of disease susceptibility and of poor fruit-set in hot weather. These problems are so severe that in the lowland tropics almost no tomatoes are grown during the rainy season. AVRDC is conducting the first truly massive approach to tomato breeding ever to be conducted in the true tropics. We expect a major breakthrough in developing high-yielding varieties for hot climates.

The sweet potato, in our opinion, is an underrated food crop for the tropics and sub-tropics. Over 8 million metric tons are produced in South and Southeast Asia annually. More people can be fed from a hectare of sweet potatoes than from a hectare of rice. In addition to Vitamin A, the crop contains more minerals than does rice, and the tops can be eaten as a source of protein, vitamins and minerals. AVRDC has initiated a sweet potato improvement program with the objective of doubling the protein content and significantly increasing the carotene content of the roots of the varieties now being commonly grown. While working toward these primary goals, efforts naturally will be made to develop in the same varieties early maturity, higher yields and insect and disease resistance.

Although the white potato is a staple food crop in many parts of the world, it does not do well at low elevations in the tropics. AVRDC, in cooperation with the International Potato Center in Peru, will make a major research effort to develop a white potato that will form tubers under tropical conditions, particularly during the hot, rainy months.

The heading type of Chinese cabbage is another extremely popular crop that has seasonal difficulties in Asia. Although well adapted to higher attitudes and cooler seasons in the tropics, in hot weather it does not form heads and is readily attacked by several serious diseases. AVRDC plant breeders hope to create - as already has been done for the common cabbage - new heat-tolerant, disease-resistant varieties of the Chinese cabbage.

In addition to the reasons stated above, AVRDC, in choosing its 6 crops, considered the matter of coordinating its work with that of the other centers, avoiding unnecessary duplication.

The only crop that AVRDC has chosen which is a major thrust of any other center is the white potato, which, of course, is dealt with in a massive way by CIP. However, AVRDC's potato program is coordinated with that of CIP and AVRDC is working only on developing heat-tolerant varieties for the lowland tropics.

C. Research Accomplishments in 1974 and Outlook

The Soybean

Staff		Total Cost in 1976 (000's US$)
Principal	Regular	
3.5	37	$232.4

At the close of 1974, the soybean germplasm collection numbered 5,133 accessions, originating in 42 different countries. In yield trials conducted in the summer of 1974 with 128 selected varieties from the world varietal collection 38 varieties produced more than 2.5 metric tons per hectare, and 11 yielded over 3 tons.

Some 2,000 varieties from the world collection were tested for sensitivity to photoperiod. More than 200 were found which flowered within 5 days of each other whether the day length was 12 hours or 16 hours. Over 20 of them showed no difference in flowering date under the two day-lengths.

Too frequently, when grown in the tropics, photoperiod insensitive varieties selected at high latitudes flower too early to produce high yields. However, AVRDC breeders have identified a number of varieties that are insensitive to daylength yet do not flower until 35 to 40 days after seeding. Since these qualities are necessary in soybean varieties suitable for the tropics, selections with such characteristics are being used as parents.

Among the 1,000 crosses attempted during 1973 and 1974, 650 proved to be successful; the rest were selfed. From F_3 segregating populations, over 6,000 single plant pedigree selections were made in 1974. The massiveness of this breeding and selection program should soon result in the development of highly superior varieties for the tropics.

Cooperative work between the plant breeding and plant pathology departments has identified varieties or genetic lines with moderate resistance to soybean rust (Phakopsora pachyrhizi), and with strong resistance to downy mildew (Peronospora manshurica), purple seed stain (Cercospora kikuchii) and the soybean mosaic virus.

The plant pathologists are conducting intensive studies of the soybean rust organism. Their investigations include the identification of physiologic races, host range, the disease cycle and the production of spore germination inhibitors.

The bean fly (mostly Melanogromyza phaseoli) is probably the most serious insect pest of the soybean in Asia. AVRDC screening trials for varietal resistance to this insect were conducted in Taiwan, the Philippines and Thailand. Eight varieties appeared to have high resistance at all locations, and 66 percent proved to be moderately resistant.

Studies by the soil scientist showed that NH_4-N is quite toxic to the soybean plant. Tests with nutrient solutions revealed that the seed yield at a concentration of 30 ppm of nitrogen was twice that of the NH_4-N pots when the nitrogen was supplied in the nitrate form. Furthermore, field trials indicated that nitrogen fertilizer applied at the flowering stage increased yields.

Studies of carbohydrate synthesis in the soybean, conducted by the physiologists, indicated that up to the beginning of seed formation, source was the limiting factor and that after the flowering stage, sink appeared limiting. These conclusions were based on studies of CO_2 enrichment and shading and on measurements of carbohydrate accumulation.

Marked increases in yields of the Shih-Shih variety were obtained as population densities were increased from 100,000 to 300,000 plants per hectare. However, densities of 400,000 and 500,000 plants per hectare produced only small additional yield increases. Yield levels varied greatly with planting date. The causes for these fluctuations need further study.

One soybean cultivar (Accession number 2120) has produced as many as 1,200 pods per plant under conditions of wide spacing. The yields per hectare calculated from greenhouse tests were incredibly high. The accession is photoperiod-sensitive and hence can be grown only in the summer and fall seasons. Nevertheless, because of its apparent high yield potential, it is being used intensively in the crossing program. Accessions with such properties give us hope of a major breakthrough in developing soybean varieties for the tropics.

The Mungbean

Staff		Total Cost in 1976
Principal	Regular	(000's US$)
2.5	37	$242.0

During 1974, 546 mungbean cultivars were added to AVRDC's world collection, thus bringing the total number of accessions to 2,362. Other closely related species in the genus Vigna numbered 388. This germplasm collection was shared with scientists in other countries; 4,961 seed packages were sent to 24 scientists in 15 different foreign countries.

Yield trials of superior varieties from the world collection and from F_4 and F_5 generation progeny in the breeding program showed that relatively short, determinate plant types gave the highest yield under planting densities of over 100,000 plants per hectare. A yield trial of 20 elite varieties from the world collection gave a maximum yield of 2.46 mt/ha (Tainan #1). The average yield was 1.86 mt/ha. These values are about triple those obtained by the average farmer in Southeast Asia.

As with the soybean, CO_2 enrichment increased yields and shading decreased them - principally by influencing the number of pods per plant.

Population density studies conducted in 1974, using different varieties from those in 1973, generally showed that yield increased with population densities up to about 400,000 plants per hectare. The tentative conclusion is that there is a strong variety/population-density interaction in mungbeans. These studies will be continued.

The protein content of the mungbean varieties in the world collection ranged from 20 to 28 percent, averaging about 24 percent. However, when plants were subjected to radiation to induce mutations, several produced seeds containing from 32 to 34 percent protein.

Large mungbean populations were screened for resistance to Cercospora leaf spot, the most serious fungal disease of mungbeans in Southeast Asia. A number of varieties proved to have high resistance. Comparisons of varieties similar except for resistance to leaf spot showed that the resistant varieties often yielded about twice as much as the susceptible ones. The resistant cultivars, of course, are being used in the crossing program.

The bean fly is the most serious insect pest of the mungbean. AVRDC entomologists conducted extensive resistance evaluation studies in Taiwan, the Philippines and Thailand. A few varieties proved to have low (less than 20 percent) levels of infestation at all locations. It appears that mungbean varietal resistance to insect attack exists and that undoubtedly this character can be transferred to otherwise superior varieties.

Root diseases cause serious yield losses in mungbeans, especially when the crop is continuously grown on the same field. Our plant pathologists have shown that damping-off, caused mostly by Rhizoctonia solani and sometimes by Pythium sp., causes high mortality at the seedling stage. Root rots are caused mostly by Fusarium and Pythium species. Preliminary trials to identify resistant varieties were only partially successful. More extensive screening trials are needed to determine the potential for identifying resistant varieties.

Pot culture experiments in the greenhouse, using soil from the experimental field, indicated that mungbean yields can be increased by the addition of zinc, but there was no consistent response to copper and manganese.

The Tomato

Staff		Total Cost in 1976 (000's US$)
Principal	Regular	
2.5	27	$178.8

The world collection of tomato varieties at the end of 1974 stood at 3,974 accessions. In 1973 and 1974, 3,799 accessions were screened for heat tolerance (the ability to set fruit when night temperatures remain above 22°C), and only 31 of them set fruit abundantly. It is interesting to note that the source of these heat-tolerant varieties was not necessarily the tropics: 4 came from Canada, 2 from England, 4 from Hungary and 3 from the U.S.A. Half of them, however, did come from tropical countries.

The major emphasis of the breeding program is to develop varieties with heat tolerance and bacterial wilt resistance. However, in 1974, the breeders made over 400 crosses, many of which were directed toward combining high ascorbic acid and vitamin A contents, crack resistance and deep red color in addition to heat tolerance and bacterial wilt resistance. Moreover, varieties that are resistant to tobacco mosaic virus, to gray leaf spot (Stemphylium solani) and to a few less important diseases have been identified by the plant pathologists. These qualities are also being incorporated into the new varieties.

A breeding program attempting to introduce such diverse characteristics into improved varieties is bound to proceed slowly. However, lines combining tobacco mosaic virus and bacterial wilt resistance have been identified and are proving to be highly superior to local varieties, particularly at low elevations in Thailand, Malaysia and the Philippines.

The plant pathologists have mounted a major program to study the bacterial wilt organism (Pseudomonas solanacearum). Already they have divided the different Taiwanese isolates into 4 types based on morpological differences and have classified about 100 isolates in accordance with their virulence. Methods of inoculation and testing for varietal resistance have

been developed. Actually, millions of individual plants in segregating populations have been inoculated and rated as to degree of resistance to bacterial wilt. This program, of course, is carried on in close collaboration with the plant breeders, and the related selections are fed back into the breeding program.

We are confidant that within the next few years highly superior varieties for the fresh fruit market and for the processing industry will be developed - varieties that are disease resistant and that can be grown throughout the year under tropical conditions.

The Chinese Cabbage

Staff		Total Cost in 1976
Principal	Regular	(000's US$)
2.5	25	$169.2

Substantial progress was made during 1974 in developing superior varieties of Chinese cabbage (Brassica pekinensis) for the tropics. Crosses between Korean and Taiwanese cultivars produced individual plants in the segregating population that in the hot summer months formed heads that were 3 times as large as the best of either parent. This convinces us that in a few years we shall be able to breed new heat-tolerant varieties of Chinese cabbage that will produce heavy, dense heads during the summer months. This will do much to increase farmer's income and to stabilize prices for the consumer.

Studies of the morphological characters associated with heat tolerance revealed that the varieties that withstood high temperatures had heavy, thick leaves, shorter petioles and larger main roots with more secondary branching roots, as compared with the non-heat-tolerant varieties.

In addition to soft rot, the pathologists have revealed that downy mildew (Peronospora parasitica) and turnip mosaic virus are important diseases of Chinese cabbage in the cool months and that white spot (Cercosporella brassicae)can be a serious disease in the summer. They have carried out extensive screening tests for varietal resistance to these diseases. Only a few varieties showed resistance to white spot, but the application of a fungicide (Dithane M-45) significantly reduced infection. The screening for resistance to downy mildew and turnip mosaic virus was more extensive, involving several hundred accessions from the world collection (now numbering 593). It was found that most varieties are susceptible to a disease. Fortunately, however, individual varieties were found that have high resistance to downy mildew and to turnip mosaic virus.

Using the results obtained by the plant pathologists, the breeders are combining multiple disease resistance with heat tolerance. The outlook for success in this effort is bright.

The entomologists have screened Chinese cabbage varieties for varietal resistance to insect attack. Although there are differences, the most resistant varieties, unfortunately, are damaged to the extent of rendering the product unfit for marketing. This result is primarily due to the wide host range of such lepidopterous, leaf-eating insects as the diamond back moth, cabbage butterfly and cabbage looper. The entomologists differences among varieties are sufficient to warrant the use of the more resistant varieties in an integrated pest management control system.

Besides studying the use of chemical insecticides the entomologists are investigating the control of cabbage insects by the use of granulosis viruses of insects. Early results are promising.

The Sweet Potato

Staff		Total Cost in 1976 (000's US$)
Principal	Regular	
2.5	20	$136.5

The Sweet Potato improvement program, which got off to a slow start in 1973 because of difficulties in synchronizing flowering among varieties selected as parents, moved ahead rapidly in 1974. Over 300 successful crosses were made from which 3,500 seeds were harvested. We obtained over 10,000 open-pollinated seeds from our nursery, and additional seeds were secured from Korea, from Louisiana State University and from IITA in Nigeria. Altogether some 16,000 seeds were sown during the year.

The original objectives remain the same; to develop varieties that produce roots containing high amounts of protein and vitamin A and that have acceptable eating quality for Asians. Naturally, earliness and high yielding capacity also are being sought.

Four yield trials of selected varieties and genetic lines were planted at different times during 1974. The highest calculated yield in 100 days was 45 metric tons per hectare, and the top yield in 140 days was 63 tons. Although there is much yet to be achieved in sweet potato improvement, yields such as these demonstrate the potential.

Plantings were made in late September to determine the behavior of selected varieties and genetic lines when grown without fertilizer, insecticides or supplemental irrigation. The highest yield obtained was 30 mt/ha in 136 days.

Studies of the sweet potato conducted by the chemists showed that there is no correlation between dry matter yield and protein content. This provides hope that a high protein, high-yielding variety can be produced. Furthermore, the chemists revealed that the protein, starch and sugar contents are essentially constant throughout the root. This is in contrast to many other crops that exhibit a high protein content in the outer portions, and more carbohydrates in the inner portions, of the edible parts of the plant.

As the sweet potato root develops, the protein content (percent of dry weight) tends to decrease while the carbohydrates increase. However, these changes are not as great as in many other crops.

The sweet potato weevil (Cylas sp.) is the most serious pest of the sweet potato. The entomologists carried out extensive trials designed to identify varieties that are resistant to the weevil. Although there were differences, no varieties proved to be really resistant. These studies will be continued, but for the time being, it appears that crop rotation is still the best method of control.

Sweet potato witches' broom is the only important disease* of the sweet potato. It is considered to be a mycoplasma rather than a true virus disease and is transmitted by a leaf hopper. Preliminary screening tests by the pathologists indicated that some varieties were quite resistant. For reasons not understood, the disease occurs in some locations and not in others.

The soil scientist studied the response of sweet potatoes to N, P. and K and found that the greatest yield increases came from the application of potassium, with less response to nitrogen, and the least to phosphorus.

The White Potato

Staff		Total Cost in 1976
Principal	Regular	(000's US$)
1.5	13	$93.4

The primary aim of AVRDC's white potato breeding program continued to be to develop varieties that will yield well in the lowland tropics.

From hundreds of varieties and segregating populations tested during the summer of 1974, about 25 were found to have produced marketable tubers. The largest tubers weighed about 100 grams, the average weight of all marketable tubers being a little over 50 grams.

The highest yield was obtained from a segregating population obtained from the University of Guelph. One selection produced, in a single hill, 8 marketable tubers, weighing 400 grams. This yield was 3 times greater than the top yield obtained in the summer of 1973.

Many new populations of true seed were received in 1974. These were being converted into tubers during the winter of 1974-1975 and will be screened for heat tolerance during the summer of 1975.

* There are important, but yet unidentified, virus-like diseases of the sweet potato in Africa.

After two more years of testing segregating populations from diverse world sources, the likelihood of achieving the objectives of the program should be known. The 300 percent yield increase obtained in 1974 over that of 1973 gives us real hope for success.

Agricultural Economics (Cost and personnel already included in crop allocations)

The agricultural economists concentrated on three projects. One was to determine the area, production and yield for AVRDC's six crops in South and Southeast Asia. This was accomplished for some of the crops in several countries. For tomatoes and Chinese cabbage, however, data are difficult to find.

Another activity was a survey, in cooperation with Chung Hsing University, of farmers in two important vegetable-growing districts of Taiwan. Valuable information was thereby obtained on farm size, marketing problems, labor availability and costs of crops grown, etc.

The third activity was to arrange with two farmers, on one hectare each of AVRDC land, to grow some of the Center's 6 crops during the year. This made it possible to keep accounts of expenditures and incomes and to assess the farmers' opinions about the constraints involved in producing the 6 crops that AVRDC has selected for study.

Training and Crop Management

Staff		Total Cost in 1976 (000's US$)
Principal	Regular	
1.2	2.0	$73.6

The Center has placed its training and crop management activities in one department. The head of these programs did not arrive until September 1, 1974. However, he has made rapid strides in getting both programs underway. A training brochure has been printed and distributed to institutions throughout Asia, and elsewhere. Several trips have been made to interview prospective candidates for training at AVRDC. The Cafeteria-Dormitory Building, an essential training facility, was completed in late September, 1974, and the training program is expected to develop rapidly in 1975. Early activities of the crop management program included studies of herbicides for AVRDC's six crops, and the use of various organic materials for mulches and compost making.

General Remarks

In the above paragraphs, we have reported the early results of an intensive research program designed to increase the yield of six important crops, by the development of superior varieties and better methods of crop management. This is being done by tapping the world's genetic resources in a massive way, followed by thorough screening programs to identify varieties

that have resistance to insect and disease attack, wide adaptability and superior yielding ability. The individual varieties selected from these screening tests are then utilized as parents in an intensive breeding program, seeking to combine in new varieties the superior qualities derived from many sources.

This work is supported by plant physiologists, chemists, entomologists, plant pathologists, soil scientists, crop management specialists and agricultural economists who work as an integrated team in achieving the objectives. We trust that the readers of this report will note, that although no unusual breakthrough have yet occurred, there is substantial progress. Just the fact that we have found varieties within the world germ plasm collections of each of the six crops that consistently show resistance to the major insects and diseases, or which have heat tolerance, or both, augers well for the future.

Proposed Budget
January 1 - December 1, 1976

1.	Research Programs	$827,800
2.	Training Programs	73,500
3.	Research Operations	224,500
4.	Other Support Operations	827,900
		$1,953,700

Anticipated Budget Support

1.	U.S.	$600,000
2.	The Republic of China	741,788
3.	Philippines	76,428
4.	Thailand	75,000
5.	Japan	75,000
6.	Korea	75,000
7.	Rockefeller Foundation	25,000
8.	Carry-over from 1974	139,763
9.	Miscellaneous income	10,000
		$1,817,979

Attachment B

SPECIAL PROVISIONS

Program Reports

A. The following reports shall be prepared:

1. One hundred (100) copies of the Comprehensive Annual Report on overall program and fiscal matters for the entire calendar year for which the grant was made;

2. Five (5) copies of a report describing proposed program and funding requirements for the ensuing calendar year (due by June 1976);

3. Five (5) copies of such other reports as may be prepared or requested from time to time on various other program activities.

B. The indicated number of copies of the above stated reports shall be submitted to the Technical Specialist indicated below:

Dr. Guy B. Baird
Associate Director Research
Technical Assistance Bureau
Office of Agriculture
Agency for International Development
Washington, D. C. 20523

Additionally, one copy of each report shall be submitted to the Grant Officer whose name appears on the grant.

C. The TA/AGR Program Specialist, whose name and address appears below, should be contacted concerning questions on report requirements. In addition, he should be consulted on any questions of a general program nature. (Questions concerning the administration of the grant by its terms shall be addressed to the Grant Officer).

John Wiles,
Program Analyst
TA/AGR, AID
Washington, D. C. 20523