PD-AAH-949-A1
9310473 (1)

931-0473

AGENCY FOR INTERNATIONAL DEVELOPMENT
PROJECT AUTHORIZATION AND REQUEST FOR ALLOTMENT OF FUNDS PART I

1. TRANSACTION CODE: A (A = ADD, C = CHANGE, D = DELETE) — PAR
2. DOCUMENT CODE: 5

3. COUNTRY, ENTITY: S&T/AGR/AP, Type A Research
4. DOCUMENT REVISION NUMBER: 3

5. PROJECT NUMBER (7 digits): 931-0473
6. BUREAU/OFFICE: A. SYMBOL: S&T; B. CODE: 10
7. PROJECT TITLE (Maximum 40 characters): Control of Vertebrate Pests

8. PROJECT APPROVAL DECISION — ACTION TAKEN: A (A = APPROVED, D = DISAPPROVED, DE = DEAUTHORIZED)
9. EST. PERIOD OF IMPLEMENTATION: (for 15-month extension) YRS. 01 QTRS. 1

10. APPROVED BUDGET AID APPROPRIATED FUNDS ($000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	PRIMARY TECH. CODE C. GRANT	D. LOAN	E. thru 09/30/80 F. GRANT	G. LOAN	E. 1st FY 81 H. GRANT	I. LOAN	E. 2nd FY 82 K. GRANT	L. LOAN
(1) ARDN	140	070	-	6,761	-	345	-	212	-
(2)									
(3)									
(4)									
TOTALS				6,761	-	345	-	212	-

A. APPROPRIATION	E. 3rd FY 83 M. GRANT	N. LOAN	O. 4th FY 84 P. GRANT	Q. LOAN	LIFE OF PROJECT R. GRANT	S. LOAN	11. PROJECT FUNDING AUTHORIZED GRANT	LOAN
(1) ARDN	-0-	-	-0-	-	7,318	-	ENTER APPROPRIATE CODE(S): 1 = LIFE OF PROJECT, 2 = INCREMENTAL LIFE OF PROJECT: 2	-
(2)								
(3)							C. PROJECT FUNDING AUTHORIZED THRU: FY 82	
(4)								
TOTALS	-0-	-	-0-	-	7,318	-		

12. INITIAL PROJECT FUNDING ALLOTMENT REQUESTED ($000)

A. APPROPRIATION	B. ALLOTMENT REQUEST NO. C. GRANT	D. LOAN
N/A		
(1)		
(2)		
(3)		
(4)		
TOTALS		

13. FUNDS RESERVED FOR ALLOTMENT: N/A
TYPED NAME (Cont. SEE REVERSE):
SIGNATURE:
DATE:

14. SOURCE/ORIGIN OF GOODS AND SERVICES: [ ] 000 [ ] 941 [ ] LOCAL [ ] OTHER _____

15. FOR AMENDMENTS, NATURE OF CHANGE PROPOSED

This amendment extends the life-of-project by 15-months (from 09/30/81 to 12/31/82), and provides additional funds totaling $557,000 for this extension.

FOR PPC/PAS USE ONLY	16. AUTHORIZING OFFICE SYMBOL	17. ACTION DATE MM DD YY	18. ACTION REFERENCE (Optional)	ACTION REFERENCE DATE MM DD YY

AID 1330-4 (3-78)

PROJECT AUTHORIZATION AND REQUEST FOR ALLOTMENT OF FUNDS

PART II

Entity: Bureau for Science and Technology
Project Title: Control of Vertebrate Pests
Project Number: 931-0473

I hereby authorize a 15-month extension, from September 30, 1981 to December 31, 1982, for the "Control of Vertebrate Pests" Project with the U.S. Department of Interior/Denver Wildlife Research Center. Funds in the amount of $557,000 will be provided for this 15-month extension. This Project will terminate December 31, 1982. This extension will be incrementally funded in FY 1981 with $345,000 and in FY 1982 with $212,000, subject to the availability of funds.

Bernard Chapnick

Curtis Farrar, Acting Senior Assistant
Administrator for Science and Technology

9/8/81
Date

Attachments:
Action Memorandum
Scope of Work and Budget

Clearances:
S&T/AGR/AP, R. Morris Rob Morris Date Aug 18 '81
S&T/AGR/AP, J. Yohe for R.D. Jackson Date Aug 18, 1981
S&T/AGR, M. Mozynski MEM Date Aug 19, 1981
S&T/AGR, J. L. Walker JLWalker Date 19 Aug 81
S&T/AGR, J. K. McDermott JKM for Date Aug 20, 81
ASIA/TR, A. Hankins Allen C Hankins Date 18 Aug 81
S&T/PO, A. Silver ade Date 9/1/81
S&T/PO, B. Chapnick [illegible] Date [illegible]
S&T/PO, M. Rechcigl _____ Date _____

AUG 20 1981

ACTION MEMORANDUM FOR THE ACTING SENIOR ASSISTANT ADMINISTRATOR FOR SCIENCE AND TECHNOLOGY

FROM: S&T/AGR, J. K. McDermott

SUBJECT: Additional Funding and Fifteen-Month Extension for "Control of Vertebrate Pests" Project (No. 931-0473; PASA ID/TAB-473-1-67)

Problem: In order for research and technical assistance to continue with the Denver Wildlife Research Center for rodent and bird control your approval is required for a final 15-month extension costing $557,000 for the period September 30, 1981 to December 31, 1982, terminating the project. This will allow S&T/AGR sufficient time to develop a new project paper with greater emphasis upon technical assistance to USAIDs for more effective field access to resources for improving rodent and bird control for a reduction in crop and postharvest food losses.

Discussion: The Denver Wildlife Research Center (DWRC) has developed a successful research and technical assistance capability for controlling vertebrate pests such as rodents, birds, and bats. During recent years, the research component of the project has focused on (1) testing new chemical control materials, (2) adapting pest baiting procedures to various pest species, and (3) experimenting with new and improved rodenticides or pesticides. Technical assistance components of the project have included control of rat damage to rice and coconuts, vampire bat damage to cattle, and bird damage to emergent grains.

The DWRC has recently provided technical backup to Mission-funded projects in Bangladesh, Haiti, and the Dominican Republic. The centrally funded activity under the project, in the Sudan, has been closed out and the USAID Mission in the Philippines has been advised to budget funds for continuation of local activities by DWRC beginning January 1, 1983.

Outreach programs and technical assistance activity accomplishments are exemplified by work conducted in the Philippines. For example, the use of sustained baiting methods and training of field technicians reduced rat damage to rice from 5% to 1% over 1,000,000 hectares of rice farms. The use of anticoagulant rodenticides in coconut crowns increased yields 230%. Cost benefit of this crown baiting technique based on actual 3-year costs of control and increased copra production, was 1:28 with potential gains for the Philippines of $192 million/yr.

This project continues to conduct research and provide technical assistance to USAIDs for the reduction of agricultural losses to vertebrate pests. Research on rodent glues and gel formations is underway. Promising results are being obtained from chemical bird repellents. Experiments are being conducted on field perches treated with soft glue for reduced field losses from birds. This approach allows a few birds to land on the perches and, once caught, the birds emit distress calls which repel the remainder of the flock. Improved rodent bait formulations will be developed with enhanced bait palatability. Selected flavorings and microencapsulation technology will be used to maintain bait gustatory and olfactory enhancements until consumption by rodents. Newly developed rodent chemo-sterilants and an improved field bait/trap station will be field tested to monitor experimental results.

Work at the field station in the Philippines has been highly successful and USAID Manila wants the project and field personnel support to continue. The USAID in Manila is willing to budget funds of approximately $100,000 for the Philippines portion of this project which has up until this time been centrally funded. Mission agreement to pick up the funding for the field station staff of one vertebrate control specialist (12 person months/annual basis) is strong support for the continuation of the project. However, sufficient time needs to be allowed for USAID Philippines to budget funds to pick up the Philippines portion by January 1, 1983.

No other private or public sector entity has the resources or expertise which is available to AID/W from the Denver Wildlife Research Center. The international experience and reputation of the DWRC staff has no equal for providing excellence in vertebrate pest control in developing country situations where agricultural and postharvest losses to these pests is high.

This project is currently scheduled for termination September 30, 1981. It had been anticipated that a new PID and PP would be ready prior to termination date, however due to personnel shortages it has been necessary to delay the preparation of the new PID and PP. This 15 month extension will provide the time necessary for S&T/AGR to complete the new Project Paper. The new project with the DWRC will be similar to the current and past DWRC activities, however, it will contain more sharply focused technical assistance for improved rodent and bird control suitable for small farmers and within their ecomomic means. This new focus results from the review and recommendations developed during the Project Review December 16-18, 1980.

This project was reviewed by the RAC at its June 1980 meeting and was approved for a terminal one year period. The RAC suggested that a new project proposal with innovative ideas and a sharp research focus be presented to the Committee at the end of the year. The RAC recommendation was approved by then Administrator Bennett in August of 1980.

External and internal reviews of the project have, in general, been favorable. The RAC's objection to the project was not based on technical or methodological problems but on the fact that the project had become very oriented toward technical assistance and its research focus had become unclear. The Committee gave several indications that the technical assistance activities should not be terminated. In approving the project, Administrator Bennett added the condition "with costs adjusted accordingly; make sure to preserve whatever is of value for technical assistance."

Accordingly, the project extension will not undertake new research activities until a highly focused research proposal is presented for review and approval by the Agency.

The scope of work and budget for this 15-month extension are attached.

Pecommendation: Considering the gross wastage and high postharvest losses due to verteberate pests, we recommend a 15-month extension requiring FY 81 funds of $345,000 and FY 82 funds of $212,000 for a total of $557,000 to permit continued operation of this project while a new PID and Project Paper are being developed.

Therefore, we recommend that you sign the attached PAF (Part II), which approves a 15-month extension (from September 30, 1981 to December 31, 1982) committing $557,000 to this project with the project scheduled for termination December 31, 1982.

Attachments: a/s

Clearances:

S&T/AGR/AP, R. Morris Rob Morris Date Aug 13 81
S&T/AGR/AP, J. Yohe R.S. Yohe Date Aug 18 1981
S&T/AGR, J. L. Walker J L Walker Date 19 Aug 1981
S&T/ACR, M. Mozynski [illegible] Date Aug. 18 1981
ASIA/TR, A. Hankins A C Hankins Date 18 Aug 81
S&T/PO, A. Silver adv Date 9/4/81
S&T/PO, B. Chapnick [illegible] Date [illegible]
S&T/PO, M. Rechcigl _____ Date _____

S&T/AGR/AP:RFMorris:ts:08/13/81:X51497

BUDGET

PROJECT TITLE: Control of Vertebrate Pests

PROJECT NUMBER: 931-0473

CURRENT PASA: ID/TAB-473-1-67

Budget Item	FY 81 Funds FM: 9/30/81 TO: 6/30/82	FY 82 Funds FM: 7/1/82 TO:12/31/82	Total Funds FM: 9/30/81 TO:12/31/82
Salary and Benefits	$251,788	$135,325	$387,113
Travel	10,000	34,188	44,188
Printing and Reproduction	5,000	1,562	6,562
Equipment	2,500	2,937	5,437
Supplies	8,500	3,760	12,260
Other Services	5,000	4,990	9,990
Contingency		1,500	1,500
Applicable Overhead	62,212	27,738	89,950
SUBTOTAL	$345,000	$212,000	
		GRAND TOTAL	$557,000

BUDGET

PROJECT: Control of Vertebrate Pests

PROJECT NUMBER: 931-0473

CURRENT PASA: ID/TAB-473-1-67

Budget Item	Outreach	Supporting Sciences	Philippines	Total FM:09/30/81 TO:12/31/82
Salary and Benefits	$144,580	$170,155	$72,378	$387,113
Travel	15,000	--	29,188	44,188
Printing and Reproduction	3,125	1,875	1,562	6,562
Equipment	3,125	--	2,312	5,437
Supplies	3,125	6,250	2,885	12,260
Other Services	--	6,250	3,740	9,990
Contingency	--	--	1,500	1,500
Applicable Overhead	--	--	--	89,950
SUBTOTAL	$168,955	$184,530	$113,565	
			GRAND TOTAL	$557,000

STATEMENT OF WORK

PROJECT: Control of Vertebrate Pests

PROJECT NUMBER: 931-0473

PASA NUMBER: ID/TAB-473-1-67

I. Purpose

To provide technology transfer to host countries and to carry out applied research for exploration of improved rodent and bird control measures. Research work will be centered at the Denver Wildlife Research Center (DWRC) and field technology transfer will occur at the request of host countries and USAIDs.

II. Work to be Performed

A. Pharmacology Formulation

1. Develop and test bird and rodent glues suitable for field use by small farmers.

2. Develop grease or gel formulations for delivery of rodent toxicants suitable for use by small farmers.

3. Evaluate microencapsulation and other controlled release methods for increasing the effectiveness and longevity of bait enhancement chemicals or pest control chemicals prone to volatilization.

4. Evaluate bird repellant chemicals and methods suitable for use by small farmers for crop protection.

5. Evaluate fumigants for control of burrowing rodents.

6. Evaluate rodent chemo-sterilants alone and in combination with pheromones and/or flavor and other odor enhancements for more effective rodent baits.

B. Behavioral Biology

1. Use new trapping devices capable of recording feeding behavior and effecting instantaneous euthenizing of rodents within the trap device for evaluation of improved bait formulations.

2. Investigate rodent grooming behavior for control applications.

3. Examine rodent behavior associated with feeding activity when bait attractants, pheromones or chemo-sterilants are added to rodent baits.

4. Examine nesting behavior of one important pest bird for possible control applications.

5. Examine new approaches to frightening birds away from field crops.

C. Sensory Biochemistry

1. Evaluate rodent sex pheromones for enhanced rat bait attractiveness.

2. Evaluate odor and flavor compounds for increasing rodent bait palatability and acceptance.

3. Screen 2 sorghum varieties for bird-resistant characteristics and explore collaborative variety trials with other agencies or international agricultural research centers.

D. Physiology - Biology

1. Evaluate stress in selected vertebrate species as a possible means of crop damage control.

2. Evaluate marking systems for studying movements and activity of vertebrate pests.

3. Study reproductive behavior of one rodent species in relation to baits containing sex pheromones and/or chemo-sterilants for improved pest control.

E. Outreach and Information Activities

1. Respond to USAID Mission requests for evaluation, liaison, and technical assistance when supported by Mission funding.

2. Develop a bibliography related to bird control for the reduction of pre- and postharvest food losses. The bibliography will include retrospective data base searches of such topics as bird-resistant sorghum, quinoa, or other bird resistant crops, saponins and other chemical compounds and bird control measures.

3. Develop and print simple, highly diagramatic (pictographic) extension-type materials for use in English, French and Spanish speaking developing countries for improved rodent and bird control.

4. Develop a Bibliography which presents a historical survey of rodent control chemicals and exhaustively covers chemo-sterilants, pheromones, and rodent flavor and odor preferences of bait components.

5. Investigate and develop a methodology for assessing pre- and postharvest rodent losses appropriate for use in surveying rodent damage in field and storage situations on small farms in developing countries. The methodology will be prepared in English, French and Spanish.

F. Philippine Station-(15 person months of activity)

1. Improve rat control techniques developed for rice and coconuts.

2. Investigate, evaluate, and develop control methods for rodent damage problems in sugarcane, coffee and corn.

3. Monitor cyclic rat populations in non-cultivated areas which may lead to the development of large-scale prevention control.

4. Evaluate bird damage potential and develop control methods.

5. Continue to provide training for local personnel and international trainees; contribute to the institutionalization of research and applied technology as a part of the National Crop Protection Center's vertebrate pest control program.

III. Reports

A. Annual Reports - within 90 days after completion of 12 months of project activities - 40 copies to be provided to AID/Washington. Other copies to be distributed to International Agricultural Research Centers and other donor agencies and researchers worldwide.

B. Other publications and special reports or documents may be requested by AID/Washington or the Project Officer. These reports will be used to disseminate information, describe research or technical assistance results and provide tools for training programs.

C. The contractor shall submit three (3) copies of all reports listed as being a product of the contract (administrative, progress, final and technical reports, etc.) to the Documentation Coordinator, S&T/DIU, Agency for International Development, Washington, D.C. 20523, or the Coordinator's designee. Such reports shall include a title page showing the title of the report, project title and number as set forth in this contract. One copy of each report shall be clearly typed or printed on white paper so that it may be photographed to produce a micro-film master. Technical reports shall be accompanied by an author-prepared abstract.

D. All reports and publications shall be submitted to AID/S&T/AGR/AP for review prior to publication.

E. Reports of project and progress shall be submitted on appropriate CRIS forms (supplied by USDA) with copies to AID Project Officer.

PD-AAH-949-B1
9310473 (2)

9310473001503

CLASSIFICATION

PROJECT EVALUATION SUMMARY (PES) – PART I

Report Symbol U-447

1. PROJECT TITLE	2. PROJECT NUMBER	3. MISSION/AID/W OFFICE
CONTROL OF VERTEBRATE PESTS (PROJECT #931-0473)	931-0473	DS/AGR

4. EVALUATION NUMBER Enter the number maintained by the reporting unit e.g., Country or AID/W Administrative Code, Fiscal Year, Serial No. beginning with No. 1 each FY) 81-22

☐ REGULAR EVALUATION ☒ SPECIAL EVALUATION Dec. 1980 3/11/81

5. KEY PROJECT IMPLEMENTATION DATES			6. ESTIMATED PROJECT FUNDING		7. PERIOD COVERED BY EVALUATION	
A. First PRO-AG or Equivalent	B. Final Obligation Expected	C. Final Input Delivery	A. Total	$ 6,761	From (month/yr.)	Dec. 1979
FY 78	FY 81	FY 81	B. U.S.	$ 6,761	To (month/yr.)	Dec. 1980
					Date of Evaluation Review	Dec. 16-18, 1980

8. ACTION DECISIONS APPROVED BY MISSION OR AID/W OFFICE DIRECTOR

* A. List decisions and/or unresolved issues; cite those items needing further study. (NOTE: Mission decisions which anticipate AID/W or regional office action should specify type of document, e.g., airgram, SPAR, PIO, which will present detailed request.)	B. NAME OF OFFICER RESPONSIBLE FOR ACTION	C. DATE ACTION TO BE COMPLETED
(1) Prepare a new five (5) year project paper for a technical assistance project as recommended by the review team. (Project manager recommends that this be accepted by AID.)	Denver Wildlife Research Center	April 30, 1981
(2) Conduct a benefit/cost economic analysis of the Project by the U. S. Department of Interior Economists. (Project manager concurs in this.)	Denver Wildlife Research Center	Sept. 30, 1982
(3) Encourage Regional Bureau and Mission to fund country and regional centers. (This action has been largely accomplished over the past two (2) years. Currently DS provides support only to DWRC Staff for backstopping and the Philippines. All other field activities, including out-reach travel are funded by the Missions or Regional Bureaus.) See recommendation from the Project Manager in (4).	J.W.Walker/ DWRC	On going
(4) Project Manager recommends that DS/AGR/W terminate central funding to country and regional activity, effective September 30, 1982. After this date central funding used only for DWRC back-up.	J.W.Walker/ DS/AGR	September 30, 1982
(5) Conduct participant training with country or regional bureau funding, except DWRC instructors and facilities. (Project manager concurs in this action.)	Denver Wildlife Research Center/ Regional Bureaus	On going
(6) Develop package programs of communication media for use in other countries. (Project Manager concurs)	Denver Wildlife Research Center	July 1, 1982
(7) In the future this Project should be categorized as technical assistance not primarily research. (Project manager concurs.)	Donald R. Fiester/ DS/AGR	Effective on approval of this PES
(8) See attached for further comments from Project Manager.		

* EVALUATION RECOMMENDATIONS WILL BE CONSIDERED – ALONG WITH FUNDING CONSTRAINTS – DURING PREPARATION OF FY-83 ABS.

9. INVENTORY OF DOCUMENTS TO BE REVISED PER ABOVE DECISIONS

☐ Project Paper ☐ Implementation Plan e.g., CPI Network ☐ Other (Specify)
☐ Financial Plan ☒ PIO/T PAF
☐ Logical Framework ☐ PIO/C ☐ Other Specify)
☐ Project Agreement ☐ PIO/P

10. ALTERNATIVE DECISIONS ON FUTURE OF PROJECT

A. ☐ Continue Project Without Change
B. ☒ ~~Change Project Design and/or~~ Change emphasis to technology transfer from research mode. Approved for 5 year extension.
☐ ~~Change Implementation Plan~~
☐ ~~Discontinue Project~~

11. PROJECT OFFICER AND HOST COUNTRY OR OTHER RANKING PARTICIPANTS AS APPROPRIATE (Names and Titles) DFiester Director

John W. Walker, Project Manager — Mary Mozynski, Program Analyst 4/23/81
Richard Hughes Deputy Director 4/23/81 — DS/AGR/AP:DButchart
DS/AGR/AP:JMYohe — DS/AGR:JWalker
DS/PO:ASilver — DS/PO;MRechcigl

12. Mission, A.I.D./W Office Director (Name and Title)

Signature

Typed Name Tony Babb- DAA/DS/FN

Date 5/11/81

AID 1330-15 (3-78)

COMMENTS BY PROJECT MANAGER

The review team documented that worldwide demand for greater food production and better nutrition increases world concern for protection of animals, crops, and stored products from depredations by bats, rats, other mammals, and noxious birds. The current project has stressed the feasibility and cost effectiveness of increasing the food supply through protection of food stocks by means of vertebrate pest control (VPC).

The Denver Wildlife Research Center (DWRC) uses a team approach for the most effective means of transfer along with problem-oriented research by DWRC staff to back-up field programs in LDCs.

Centers of expertise, established in the Philippines, Bangladesh, Sudan and Haiti/Dominican Republic, serve as regional and country models, and focus on problem evaluation and technology transfer relative to rodent and noxious bird problems in those and nearby countries. The team recognized that this project is basically technology transfer, but is vitally supported by the ongoing research staff and facilities of DWRC.

Travel costs associated with the out-reach program are paid by the missions or regional bureau.

Missions in additional countries (i.e. Egypt and Indonesia) have expressed an interest in control of vertebrate pests projects in the near future. These countries will rely upon the DWRC to get started and for technical back-up.

Because of the continuing long-range needs of the LDCs for reducing vertebrate pest depredations of world food supplies and the lack of a skilled vertebrate pest staff and well equipped facility similar to DWRC elsewhere in the world, the review team recommended the preparation of a new project paper by DWRC, emphasizing technology transfer. The review team also recommended that the new project be scheduled for up to five years.

The Project Manager recommends that DS accept the review team report with the following modifications:

(1) Set up the new project for five years, but schedule DS funding for the Philippine Center to terminate on or about September 30, 1982. This would allow sufficient time for the Asia Bureau or Mission to determine whether it wishes to provide regional support and arrange funding. Hence, after September 30, 1982, DS would fund only the staff at DWRC to service the country and regional centers.

(2) Require DWRC to step up preparation of a system of packaged training courses and aids (i.e. casettes, 2 x 2 slide series, and other auto-tutoral materials) to be completed by July 1, 1982.

(3) Require DWRC to implement a plan to establish more accurate benefit/cost economic analysis data no later than September 30, 1981 and to be completed no later than September 30, 1982.

[illegible]
[illegible] 9/1/81

PROJECT EVALUATION SUMMARY (PES)

PART II

Control of Vertebrate Pests

Project: 931-0473
Contract: PASA/ID/TAB-473-1-67

Contractor: USDI-FWS-Denver Wildlife Research Center
Principal Investigator: John DeGrazio
AID Project Manager: John W. Walker

Review Team:

Dr. William B. Jackson (Leader)
Mr. William D. Fitzwater
Dr. Douglas Butchart
Dr. Walter E. Howard
Dr. J. D. Montgomery
Mr. Lynwood A. Fiedler
Dr. John Walker (ex-officio)

15 January 1981

#13 - Summary

The demand for greater food production and better nutrition increases world concern for protection of animals, crops, and stored products from depredations of bats, rats, other mammals, and noxious birds. The current project has demonstrated the feasibility and cost effectiveness of increasing the food supply and protecting food stocks by means of integrated vertebrate pest control (VPC).

This project began by emphasizing research into biology of vertebrate pests and continues with utilization and adaptation of research to the needs of lesser developed countries (LDC). The Denver Wildlife Research Center (DWRC) uses a team approach towards technology transfer along with problem-oriented research as a back-up to field programs in LDS'c (appendix table 4).

Control of vampire bat rabies in Latin America, resulting from an extensive AID/DWRC research program, has been phased into local maintenance programs.

The Philippine center has become a focal training center for the dissemination of rat control programs in Asia, and trained personnel have spread into national programs in that part of the world. Centers of expertise, established in Bangladesh, Sudan, and Haiti-Dominican Republic, serve as models and focus on problem evaluation and technology transfer relative to rodent and noxious bird problems in those and nearby countries.

Identified additional needs include consultants to develop appropriate economic analyses, policies, and strategies for implementing integrated pest management programs and package programs of appropriate communications media for use in other countries.

#13 - Summary (continued)

The committee recognized that this project consists primarily of a program of technology transfer but is critically supported by the ongoing research staff and facilities of DWRC.

Because of the continuing long-range needs for reducing vertebrate depredations to world food supplies and the lack of a vertebrate pest research facility similar to DWRC elsewhere in the world, the committee recommends a 5-year extension of the present program. Also, the committee urges AID to continue support of the existing technology transfer project with DWRC and to supplement problem-solving research both at DWRC and elsewhere as needs are identified.

#14 - Evaluation Methodology

Open discussion and examination of DWRC exhibits by committee members and other participants indicated that technology transfer, with research components as needed, is descriptive of the future course of this project.

The evaluation team was made up of the following:

Dr. William B. Jackson, Chairman, Bowling Green St. Univ., Bowling Green, Ohio 43403 (419/372-0207)

Dr. Douglas Butchart, AID/AFR/ARD/DR; Representing Technical Program Committee for Agriculture (TPCA), Wash. D.C. 20523 (202/632-8716)

Lynwood A. Fiedler, National Crop Protection Center, DWRC/USAID Manila, APO-San Francisco - 965528

William D. Fitzwater, Director, bioLOGIC consultants, 3919 Alta Monte, N.E., Albuquerque, N.M. 87110 (505/883-9249)

Dr. Walter E. Howard, Dept. of Wildlife, Fisheries, and Biology, Univ. of California, Davis, Calif. 95616 (916/752-2564)

Dr. J. D. Montgomery, Representing the Research Advisory Committee (RAC), Harvard University, Cambridge, Mass. (617/830-2148)

The following AID staff members participated in the evaluation:

Essie S.R. Brown, DSB/AGR/AP (AID) - Program Person

Allan Hankins, ASIA/TR (AID) - TPCA (Member of subcommittee for VPC Project) Washington, D.C. 20523

Victor Lateef, NE/TECH (AID) - TPCA (Member of subcommittee for VPC Project) Washington, D.C. 20523

W. Phillip Warren, LAC/DR (AID) - TPCA (Member of subcommittee for VPC Project) Washington, D.C. 20523

#14 - Evaluation Methodology

The following U.S. Fish and Wildlife Service staff members participated in the evaluation:

John DeGrazio - Chief, Section of International Programs, DWRC, Denver, Colorado

Dr. Clyde Jones - Director, DWRC, Denver, Colorado

Richard Smith - Associate Director of Research, U.S. Fish and Wildlife Service, Washington, D.C.

#15 - External Factors

The successful operation of this project in the mode established over the past 13 years emphasized nine major changes in the working context of vertebrate pest control (VPC):

(1) There is no diminution in total demand for technical assistance in VPC despite increased capabilities in such countries as the Philippines and Bangladesh, Sudan, Dominican Republic/Haiti, and others over the next three to five years.

(2) Growing experience with different sets of national problems has suggested the desirability of developing a standard "package" for analyzing country needs and determining optimal technological mixtures for different situations.

(3) One country (the Philippines) that has developed national capabilities in VPC already has provided regional services to other nations (e.g., Samoa, Bangladesh, Venezuela, Thailand, Nepal, and Korea). This experience suggests the importance of working through regional centers of expertise to provide technical assistance in countries that cannot be accommodated within the limited staff and budgets of DWRC. Special attention might now be paid to the possibility of working with CGIAR institutions.

(4) Such regional centers will need additional inputs beyond technical assistance and individual training programs that include the capacity to serve institutional requirements for programs. Planning such efforts could be considered at Asia and Africa/Latin America workshops (see appendix table 3 for details).

#15 - External Factors (continued)

(5) Programs dealing with vertebrate pests in many countries rarely have achieved a steady state of continuous control. Usually the pattern of action begins with a crisis project in response to large-scale animal damage to crops, followed by neglect of the problem once the losses are reduced to tolerable levels. The resulting policies follow the "boom-or-bust" model rather than one of "maintenance of control," which calls for different organization, technical assistance, research strategies, and models of American assistance than is followed in more standard agricultural operations (e.g., development of high yielding varieties or insect control). Thus the DWRC project must be prepared to respond to crises by providing technical assistance and backstopping as well as by supporting infrastructure development in LDCs.

(6) That vertebrate pests cause significant and sometimes greater crop losses than do insects has not been recognized by international agencies, ministries of agriculture, or animal biologists in spite of the data generated by this project. Demonstrating dimensions of the problem and the increasing capabilities for dealing with it call for new strategies of technical assistance on the part of DWRC and AID.

(7) The R&D achievements of DWRC have produced a "bankroll of technology" that can be drawn on in many countries that now have no access to it. These achievements include the use of radiotelemetry, tracking methods, capture and marking techniques, damage assessment procedures, and combinations and uses of rodenticides and repellents. Further experience with VPC in different

#15 - External Factors (continued)

settings will provide a basis for identifying future R&D requirements and opportunities.

(8) The trend toward multi- and intercropping and continuous harvest farming (e.g., "rice gardens") creates greater vertebrate pest problems and requires development of new control techniques, especially for small farmers.

(9) With changing agronomic methodologies and greater crop and cultural diversification, concern for integrated pest management (IPM) is apparent.

#16 - Inputs

The committee perceived no need for altering the present campaign for reducing food losses by pest vertebrates except for adding these additional technologies to countries not now able to utilize them. Additional activities to facilitate technology transfer are needed but are beyond the immediate scope and budget of the present project. These needs included:

- Use of economic consultants (especially from host countries) to work with projects in developing crop loss/damage estimates, project improvement data, and cost/benefit ratios.
- Use of management consultants to evaluate strategies (criteria) for the establishment of vertebrate pest programs and effective technology transfer. After such criteria had been defined, major research might be needed for large-scale implementation.

DWRC has provided services in more than 35 countries. Some of these have been responses to acute needs with little or no follow-up. Others have been joint efforts with other agencies. The capability for such responses, especially for follow-through operations, is important and should be retained.

Increasingly the concept of integrated pest management (IPM) is a part of program rationale and planning. This concept requires linkages with other agricultural specialists and planners. Concern for planting schedules, irrigation engineering, intercropping, and weed control must be involved. Also concern for reduction of post-harvest losses, especially, deserves high priority attention.

The committee considered that a formal external advisory committee to DWRC would be highly desirable to provide ongoing reaction and support to plans and operations and to provide linkages to other research activities and users.

17 - Outputs

Progress toward the major goal of increasing the available human food supply and protecting food stocks by reducing losses from bats, rats, other mammals, and obnoxious birds has been found to justify expenditures made and is expected to fulfill ongoing objectives. Some examples of significant outputs of this project's problem-oriented research-training-extension activities include:

1. Developing suitable damage assessment analysis techniques;
2. Determining the economic losses caused by vertebrate pests to several agricultural crops (see Appendix 1);
3. Confirming the significant economic gains in certain agricultural crops resulting from application of newly developed control methodology and from training host country counterparts (see Appendix 1);
4. Developing significant improvements in technology/methodology for studying necessary aspects of the ecology, behavior, population dynamics, and control of problem species of birds and rodents;
5. Closing the project's Mexico vampire bat control methodology station when its missions was accomplished;
6. Extending the vampire bat control methodology in outreach programs to 18 Latin American countries;
7. Continuing operation of field stations in the Philippines and Sudan (DSB funded) and research-training bases in Bangladesh (Mission funded) and Haiti-Domican Republic (LAC funded);
8. Institutionalizing rodent control in rice in the Philippines and extending the rodent control model through outreach to other Asian countries (appendix table 2); and
9. Investigating non-lethal control methods of protecting small grain from birds.

#17 - Outputs (continued)

10. The program planning in a comprehensive pest management project in Sudan for 1981 and Indonesia proposed for 1982 incorporated a component for reducing losses caused by vertebrate pests. Experience has shown that increasing crop production by involving irrigation and seed improvement cannot progress unless control of pests is included as a component of the project.

#18 - Purpose

The project aims to develop safe, effective, and economical vertebrate pest control methods that are appropriate for use by small farmers and acceptable in the broader context of agricultural development and environmental protection.

There has been continued progresss toward this purpose. Self-sustaining, in-country programs are the expected end result of the project. Considering the wide diversity of ecological and cultural conditions under which vertebrate damage occurs, and the variety of species involved, the End of Project Status (EOPS) is difficult to define except on an individual country basis. The vampire bat-rabies field station in Mexico, for example, has been terminated because its mission was accomplished, while rodent control stations are just being introduced in Bangladesh.

The evaluation team does not accept AID's rather inelastic EOPS criteria for evaluating this type of project. A more realistic approach would consider country variations and program variables in establishing a causal linkage between project inputs, outputs, and purpose. Defining the EOPS in a more adequate time-frame than previously applied suggests a 5-year period for the project renewal.

#19 - Goal/Subgoal

The project goal is to increase the available human food supply in developing countries by reducing the risk of severe losses to agriculture caused by bats, rats, other mammals, and noxious birds.

This goal is being achieved through the development and application of:

(1) Safe, effective, and economical control methods.

(2) Self-sustaining, in-country programs and monitoring of these methods and implemented programs.

Progress to date includes the successful development of control methods to reduce losses in cattle due to bats; in rice, corn, wheat, and coconut, due to rats. In-country programs that have incorporated these control methods include 16 South and Central American countries (vampire bat control) and the Philippines (rat damage in rice). Maintenance activities, which include monitoring of the damage levels, also exist in these countries.

Methods developed for rodent control in corn and coconut have been incorporated into national programs to a limited extent.

#20 - Beneficiaries

Most segments of human society benefit when the food supply becomes more adequate, especially when it results in modest food prices and still produces a satisfactory return on farmers' investments. The technologies being developed to protect food against loss to vertebrate pests tend to be labor-intensive rather than capital-intensive, and they are well-adapted to dissemination by extension services to small farmers.

Thus, although on a per-acre basis costs of maintenance programs are less for large than for small-scale application, these benefits may be increased by cooperation among farmers or by uniform applications arranged through government programs. The expectation, therefore, is that the distribution of benefits from vertebrate pest control will reach the poor elements of a population.

The demonstrated outreach/expansion of the newly developed vertebrate pest control technology as applied to vampire bats in Latin America and rats in the Philippines indicates the global nature of the project benefits.

#21 - Unplanned Effects

The development of the control methods at the research stage takes into account social, environmental, economic, and other potential effects. When these methods have been incorporated into national programs, the ecological effects have been as predicted. No unplanned, undesirable effects have been observed.

A desirable, unexpected effect of this project is the attitude and response of host countries to it. For example, the Government of Haiti recognized the need for vertebrate pest control and has scheduled valuable external and internal resources for the project because of the expected high payoff for funds invested. In addition, the Haitians feel that VPC is their project, because they have been involved from the beginning in its planning and operations. By its very nature, VPC can start small and not overwhelm the local government system. As the personnel acquire experience and funds, the project can very expediously and painlessly be expanded as circumstances dictate.

#22 - Lessons Learned in Response to Problems and Issues

A. General

Recent advances in rodent control technology, inroads on bird damage with technology, success of the vampire bat program, and development of numerous supportive techniques argue against AID reducing support to this project in the near future. This project deals with problems that remain and will continue to have a significant influence on agricultural productivity. It functions through a series of small individual country projects based on commitments from host governments to support DWRC's technology transfer effort.

B. DSB vs. Mission vs. Regional Bureau Funding

These projects are jointly planned from the beginning, with the host country assuming full and early responsibility for each project. A previous review team has suggested that US AID missions should replace central sources as a basis for funding many of these efforts, but this review confirmed the advantage of the present approach. Contracting through US AID missions would be difficult and less efficient, because it would tend to fragment DWRC's effort. Considering the wide diversity of ecological and cultural conditions under which vertebrate damage occurs, and in view of the variety of species involved, management methods need to be constantly evaluated and modified by a centralized, highly specialized staff as new information is received and more suitable techniques are developed.

C. Technology Transfer vs. Research

This project combines technical transfer and research. The benefits of linking research to support technical transfer or assistance are well known to development practitioners from US AID missions, even though there

#22 - Lessons Learned in Response to Problems and Issues (continued)

are administrative difficulties in dealing with such combined projects. This centrally funded project has succeeded in keeping the technical assistance and research in balance, with a heavy but declining emphasis on research that yields greater success in technical assistance as knowledge becomes available. This tie between applied research and technical assistance, together with early and effective involvement of LDC scientists in all planning and implementation, appears to be an effective use of funds for VPC.

D. Three-Year vs. Five-Year Extension and Funding

The reasons for continuing this activity with AID funding are more obvious now than when the project was initiated. Bats, rats, other mammals, and noxious birds are a continuing agricultural problem. Although this project has produced impressive advances in certain of those problems, much is left to be accomplished. AID should view VPC technical assistance and supporting research not only as a high priority item but also as one requiring a much longer time frame than has been previously presented in the project documents reviewed in this evaluation. A longer term (five years) commitment to this project by AID would strengthen this capability.

E. Role of Denver Wildlife Research Center (DWRC)

The reviewers recognize the significance of the "team approach" as practiced by the Denver Wildlife Research Center and the importance in its technical backstopping of worldwide activities. Professional staff assigned abroad are dependent on this backstopping competence and capability. US AID mission projects in the field need the Denver Center backstopping. This centrally funded project helps maintain the continuity

#22 - Lessons Learned in Response to Problems and Issues (continued)

of the professional staff of the Center and their availability for international assignments.

F. Seeking Out, Identifying, and Applying New Techniques

See item (7) in section (15) External Factors.

G. LDC Adoption of VPC Techniques

See items (3,4,5) in section (15) External Factors.

#23 - Special Comments

Depredations by pest vertebrates to our supplies of food and fiber is a problem of continuing global proportions. We are in a period of transition, building on research achievements, testing discoveries, and recognizing the importance of the ecology (both biologic and social) of the pest. The future will require extensive R&D to continue developing innovative approaches. Technological breakthroughs, significant in bat rabies and some insect control programs, have not occurred in the bird and rodent management programs.

Host country personnel for VPC programs often have been developed by retraining entomologists and other agricultural or public health workers. Direct new training also is required, both in the U.S. and the third-world countries.

In three years the world will not be significantly different; if the VPC project supported by DSB were to be terminated three years hence, probably the Philippine program could continue with direction and leadership coming from its indigenous staff and financing from the Philippine government. It is questionable whether this could occur in Bangladesh. More recently created project centers, operating as models through outreach programs to countries seeking to begin modest programs, likely would not continue. With a 5-year extension, the scenario would be considerably more favorable. However, even then, problems will not all have been solved; and the need for some form of continued support will exist. As Roger Revelle indicates (Science 30(11): 727, 1980), Biology "is a most promising field for international scientific cooperation because of the wealth of both applied and fundamental problems to be solved, the unique ecologies of the tropics, and the many short paths between fundamental research and practical application".

Table 1. Examples of assessed and estimated crop losses to rodents.*

Country and crop	Year		Total crop yield (metric tons, millions)	Percent damaged by rats	Metric tons lost (thousands)	Income lost by farmers ($ million)
Field surveys						
Philippines--Rice	1975	(traditional control)	6.5	4.6	340	68.7
	1978	(new programs effected)	6.9	0.7	49	9.7
Bangladesh--Wheat	1979	(traditional control)	0.642	12.1	78	16.0
Preliminary estimates						
Philippines--Coconuts	1979	(traditional control)				299**
	19__	(with best control)				0

* For more details and documentation, see:
Jackson, W. B. 1977. Evaluation of rodent depredations to crops and stored products. EPPO Bull. 7(2):439-458.
Jackson, W. B. and S. S. Jackson. 1977. Estimates of bird depredations to agricultural crops and stored products. EPPO Sr. B (84):33-43d.
De Grazio, J. W. 1978. World bird damage problems. Proc. 8th Vertebr. Pest. Conf. 8:9-24.
Bruggers, R. L. (ed.) 1979. Vertebrate damage control research in Agriculture. Ann. Rep. Denver Wildlife Research Center, USFWS. 106 pp.

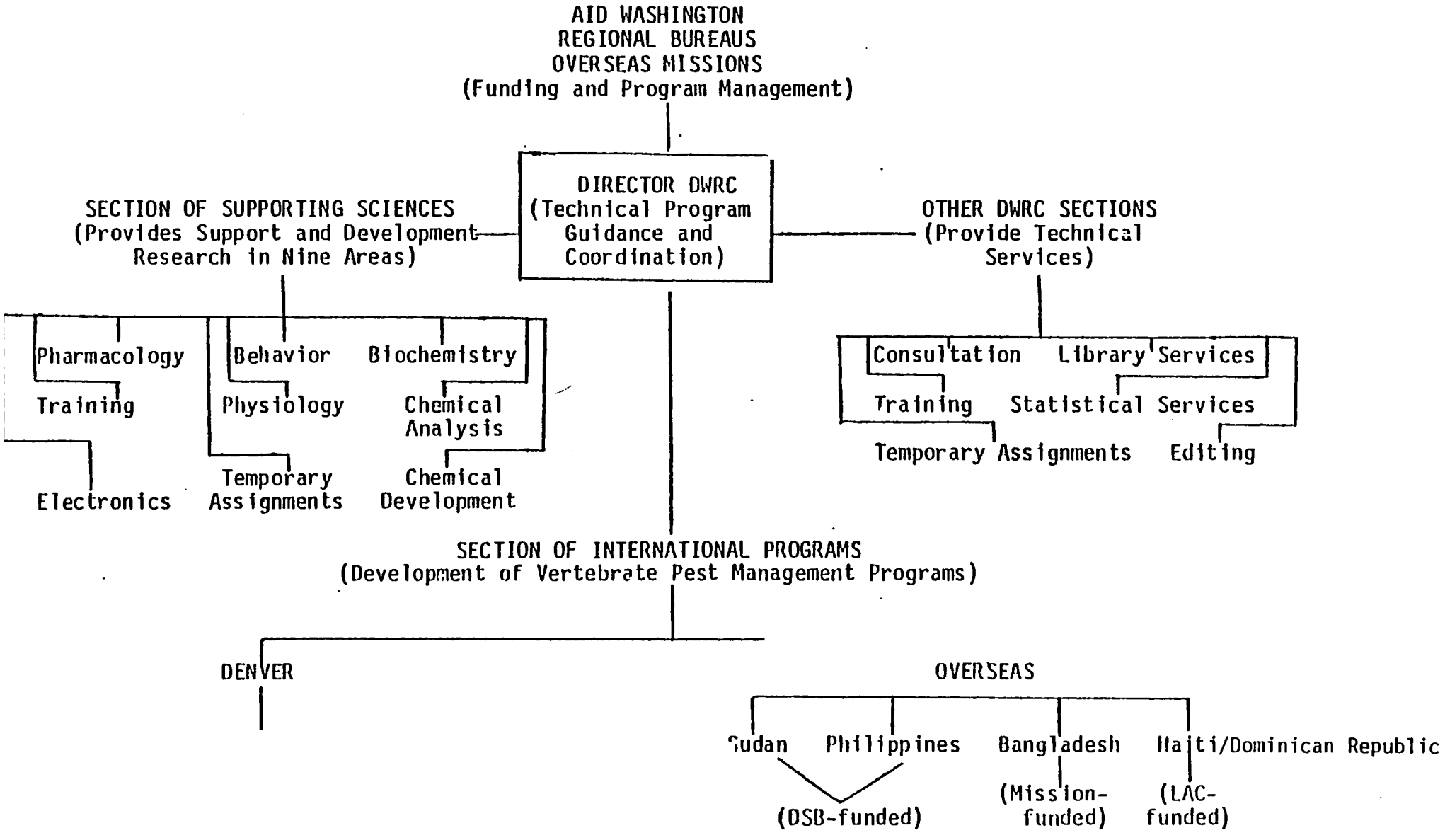
** Net loss; costs of chemicals for best control ($5,700,000) have been subtracted.

Table 2. Summary of countries involved in outreach activities by the Philippine Vertebrate Pest Control Project, 1968-1980.

Staff contact at international workshops and seminars	Short-term training at Los Banos (1-6 months)	Graduate training at Los Banos	Working visits or temporary assignments of Philippine-based staff	Workshops conducted in host countries by Philippine-based staff
Bangladesh	Bangladesh	Bangladesh	Bangladesh	Indonesia
Burma	Comoro Islands	Indonesia	Germany	Korea
Costa Rica	Indonesia	Pakistan	Great Britain	Thailand
Dominican Republic	Korea	Venezuela	Indonesia	Vietnam
El Salvador	Maldive Islands		Korea	
Fiji	Nepal		Malaysia	
France	Nigeria		Maldive Islands	
Germany	Pakistan		Nepal	
Great Britain	Sri Lanka		Pakistan	
Guatemala	United States (Peace Corps)		Sudan	
Haiti	Venezuela		Thailand	
Honduras	Vietnam		United States	
India			Vietnam	
Indonesia				
Jamaica				
Japan				
Korea				
Laos				
Malaysia				
Mexico				
Nepal				
Nicaragua				
Pakistan				
Singapore				
Sri Lanka				
Taiwan				
Thailand				
United States				
Venezuela				
Vietnam				

Appendix Table 4

AID/DWRC Interaction Chart



Appendix table 3. Cost Estimates for Policy-making Workshops held in the Philippines. (Prepared by Essie S.R. Brown, AID)

	Unit Cost		Total Cost
Transportation			
8 persons (LDC)	$ 500		$ 4,000
2 persons (DWRC)	1578		3,156
2 persons (AID/W)	1776		3,552
		Subtotal	$10,708
per diem (@$80 for 5 days)			4,800
1-week workshop (total)			$15,508
2-week workshop (total)			$20,308

Note: This does not include preparatory needs, special logistic costs, etc. Costs for a South America/Africa workshop might be considerably different.

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ANNEX D

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project
From FY 82 to FY 86
Total U.S. Funding $3,380,430
Date Prepared April 15, 1981

Project Title & Number Control of Vertebrate Pests in Agriculture; 931-0473

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Program or Sector Goal: The broader objective to which this project contributes To improve the standard of living in agricultural areas of participating countries through the development of vertebrate pest control technology.	Measures of Goal Achievement: 1. Introduction of new technology results in greater crop yields, reduced losses, and increased incomes. 2. Increased use of cost-effective technologies.	1. National agricultural and socio-economic statistics. 2. Project data and records (i.e., pest species populations, pre- and postdamage surveys, etc.).	Assumptions for achieving goal targets: 1. In-country support and maintenance of consistent agricultural development strategies and policies. 2. Affected farmers will accept and use appropriate vertebrate pest technology.
Project Purpose: 1. To provide the technology, training, and technical assistance required to successfully reduce the impact of vertebrate pests on agricultural production. 2. To stimulate and strengthen in-country capabilities in becoming self-sustaining in the field of vertebrate pest management.	Conditions that will indicate purpose has been achieved: End of project status. 1. Significance of vertebrate problems known to all sectors. 2. Knowledge and methodology for crop loss incidence and magnitude improved and in use. 3. Recommendation packages in appropriate pest control technology adapted for a variety of local conditions.	1. Program survey and monitoring reports. 2. Reports of field and laboratory evaluations. 3. Participating country reports.	Assumptions for achieving purpose: 1. Technologies developed are economically and socially acceptable. 2. Participating government and DWRC personnel available to serve project adequately. 3. U.S. and local government strategy includes crop protection components with appropriate institutional base.
Outputs: 1. Basic laboratory studies developed for field use and testing. 2. Evaluate cost effectiveness and suitability of field studies. 3. Conduct ongoing biological and ecological laboratory and field studies. 4. Recommendation packages adapted to local conditions available for major pests. 5. Ongoing outreach programs from DWRC (training, extension, demonstration).	Magnitude of Outputs: 1. Five completed annually; several continuous. 2. Three completed annually; several continuous. 3. Two completed annually; several continuous. 4. Minimum of two per year. 5. Minimum of five TDY's per year to participating countries coordinated to maximize outreach activities.	1. DWRC annual, trip, and progress reports; publications. 2. Participating country reports. 3. DWRC/USAID/Government onsite evaluations and technical reviews.	Assumptions for achieving outputs: 1. Specific pest species poses no unique obstacle to cost-effective technology. 2. Adequate DWRC and participating country personnel available. 3. Host government and AID support for program. 4. Anticipate any proposed new Mission-funded in-country projects will require backstopping by DWRC expertise.
Inputs: U.S. Government 1. Technical expertise and TDY support from DWRC. 2. Technical support incl. equipment. 3. Services, publications, and training materials costs.. Host Governments 1. Salaries and benefits for participating country personnel. 2. Technical support facilities. 3. Field sites for testing.	Implementation Target (Type and Quantity) (in million $) FY-82 FY-83 FY-84 FY-85 FY-86 1. .60 .56 .57 .53 .56 2. .25 .17 .16 .14 .16 3. .02 .02 .02 .02 .02 .87 .75 .75 .69 .74 Host government costs not quantified; dependent on local situations.	1. DWRC reports. 2. DS, Mission, and DWRC records. 3. Participating country reports and records.	Assumptions for providing inputs: 1. AID financing in place. 2. Participating government and DWRC commitments fulfilled in a timely manner. 3. Capable personnel available.