

Appendix C-OTA Survey Form

INFORMATION FORM FOR LOCUST EXPERTS

Office of Technology Assessment, U.S. Congress

Your Name _____

The Country/s or Region/s with which you are familiar and upon which you have based the following information.

Please provide a brief description of your experience related to locusts and your current position.

PART A. THE CURRENT SITUATION

1. How would you rate the intensity of the locust problem in the country or region with which you are familiar, over the last several decades? Please circle one response for each time period.

1950-59	Very Serious	Serious	Insignificant	Not Present
1960-69	Very Serious	Serious	Insignificant	Not Present
1970-79	Very Serious	Serious	Insignificant	Not Present
1980-88	Very Serious	Serious	Insignificant	Not Present

2. If you detect a serious or very serious locust problem now, please identify, with numbers 1-3, the first, second, and third most important locust species involved.

_____	Desert locust (<i>Schistocerca gregaria</i>)
_____	African migratory locust (<i>Locusta migratoria</i>)
_____	Red locust (<i>Nomadacris septemfasciata</i>)
_____	Other _____
_____	_____

3. How would you judge the geographic distribution of the locust infestations in the areas with which you are familiar over the last several decades? Please circle one response for each time period.

1950-59	Not Significant	Local	Widespread	Large/Regional
1960-69	Not Significant	Local	Widespread	Large/Regional
1970-79	Not Significant	Local	Widespread	Large/Regional
1980-88	Not Significant	Local	Widespread	Large/Regional

4. Please comment on any trends in locust problems that you see.
5. Is desertification or local weather patterns intensifying locust problems in this area? Why/W@ not?
6. Do people in the region with which you are familiar eat locusts?

Yes No

7. Please add anything else that you feel U.S. policymakers, donor groups, or researchers should know regarding the locust situation in the area with which you are familiar.

PART B. EFFECTS OF THE LOCUST INFESTATION

1. Please list the crops (export and/or subsistence crops) that are principally affected by locusts, the stage/sat which locusts attack them, and your estimate of the percentage of the country or region's crop seriously enough affected by the current locust infestation to cause a significant drop in normal crop yields.

<u>Crop</u>	<u>Stage</u>	<u>Percentage of Crop Affected</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____

2. Please estimate, if you can, the average national per hectare yield of these crops, with and without locust infestation in the country or region with which you are familiar. (Include units)

<u>Crop</u>	<u>Average Yield Without Locust Infestation</u>	<u>Average Yield With Locust Infestation</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____

3. What are the social consequences of locust infestation in the region?

4. Please list the other types of lands principally affected by locusts and estimate, if you can, the percentage of the area seriously enough affected by the current locust infestation to cause a significant threat to livestock production, tourism, soil conservation, or other important uses of non-croplands.

<u>Land Use</u>	<u>Percentage of Area Affected</u>
Grazing lands	_____
Parks and protected areas	_____
Other:	_____
_____	_____
_____	_____

5. Please add anything that you feel U.S. policymakers, donor group, or researchers should know regarding the effects of locusts in the country or region with which you are familiar.

PART C. CONTROL EFFORTS

1. Please list the national agencies that conduct locust control programs in your country or region and the international organizations that support local control programs.
2. Please list the insecticides that are used presently and were used in the past for locust control in these programs, along with their application method (e.g., ground spraying).

<u>Pesticides Used Currently</u>	<u>Application Method/S</u>
<u>Pesticides Used in the Past</u>	<u>Application Method</u>

3. On what basis are decisions made to apply pesticides, e.g., surveys, previous outbreaks, etc.?
4. How are pesticides provided (e.g., from the private sector, from donors)?

- 5. How are excess pesticides disposed of?
- 6. Have side effects from these pesticides been detected? If so, please list them.
- 7. How are safety issues addressed?
- 8. Please list the principle locust controls used by subsistence farmers in this area. Indicate whether these are used predominantly by men, women, or both.
- 9. Are village level groups taking part in locust control efforts in this area? If so, how?
- 10. What nonpesticide locust control methods are known, available, and/or encouraged in the area with which you are familiar? Please list these.
- 11. What promising new technologies are available now or might be available in the future for controlling locusts in this area?
- 12. How effective do you consider various locust control efforts to be? Very effective (vE), Somewhat Effective (SE), Ineffective (I), Don't Know (DK). Please circle one response.

International efforts	VE	SE	I	DK
National Efforts	VE	SE	I	DK
Local efforts	VE	SE	I	DK
- 13. Please add anything that you feel U.S. policymakers, donors, or researchers should know regarding locust control efforts in the area with which you are familiar.

PART D. PLANNING FOR THE FUTURE

- 1. What are the most crucial needs for dealing more effectively with potential future locust infestations in the region with which you are familiar? Please circle all that apply and feel free to add others.

Personnel:

laborers, trained technicians, scientific researchers,

Infrastructure:

facilities, roads, cars, trucks, motorcycles, airplanes, spray equipment, chemical supplies, pesticide disposal sites,

Institutions:

research laboratories, field research sites, regulations for pesticide use,

Information:

weather forecasts, locust monitoring, locust early-warning systems, locust status reports from neighboring countries,

2. How important would locusts rate if you listed the 10 most serious pests in the country or region with which you are familiar? Please circle one rating (1-most serious; 10-least serious).

1 2 3 4 5 6 7 8 9 10 lower than 10

3. Please list the three most serious needs this area faces related to current locust problems.

4. Please list the three most serious needs this area faces in all types of agricultural research.

5. Please list the three most serious agricultural research needs related specifically to locust problems.

6. How could United States' foreign aid assist most effectively in current locust problems?

7. Please characterize the proportion of various types of locust activities underway now in the area with which you are familiar (use percentages). Then please provide what you would see as the ideal proportion.

	% of C- Effort	% of Ideal Effort
Crisis Management (e.g., spraying locusts)	_____	_____
Relief Activities (e.g., providing food for affected areas)	_____	_____
Outbreak Prevention (e.g., long-term entomological research)	_____	_____
_____ (other)	_____	_____
Total	100%	100%

8. Please add anything that you feel U.S. policymakers, donors, or researchers need to know regarding planning for future locust control programs in the area with which you are familiar.

PARTE. METHODS

1. What degree of certainty do you have in the information for the country or region with which you are familiar? DK=don't know; VU=very uncertain; U=uncertain; C=certain; VC=very certain. Please circle 1 response.

Part A. Data on Current Locust Infestation

- a. Measures of the intensity and distribution of locust outbreaks.

DK VU u c V c

- b. Measures of the effects of desertification and weather on outbreaks.

DK VU u c V c

Part B. Estimates of the Effects of the Current Locust infestation.

a. Percentage of crops affected

DK VU u c VC

b. Percentage of **noncroplands** affected.

DK VU u c Vc

Part C. Your estimate of the effectiveness of locust control efforts.

DK VU u c Vc

Part D. Planning for **the** Future

a. Likelihood of improved locust control technologies

DK VU u c Vc

b. Consensus on agricultural research needs related to locusts

DK VU u c Vc

2. May we contact you for further evaluation of your responses for our report? Please circle one response.

Yes No

We appreciate the time you have spent in completing this form. Please return it by February 6, 1989 to:

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Appendix D-List of Survey Respondents

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Appendix F—Recommendations From Three Recent Reports on Pest Management in Developing Countries

Several recent studies provided comprehensive recommendations for USAID and for Congress on pest management generally and locust and grasshopper programs specifically. The recommendations from three of these are included below because Congress can find a number of important options among the recommendations:

- I. Programmatic Environmental Assessment of Locust and Grasshopper Control in Africa/Asia (1%9)
- II. Africa Emergency Locust/Grasshopper Askance (AELGA) Mid-Term Evaluation (1989)
- III. Report of the Committee on Health and Environment (1988)

SECTION I

RECOMMENDATIONS FROM THE PROGRAMMATIC ENVIRONMENTAL ASSESSMENT OF LOCUST AND GRASSHOPPER CONTROL IN AFRICA/ASIA¹

Required Precondition

This report included 38 recommendations, grouped according to priority. It recommended that:

1. USAID continue its involvement in Locust and Grasshopper Control. Operationally, the approach to be adopted should evolve toward one of Integrated Pest Management (IPM).

Top Priority, for Immediate Implementation

2. An inventory and mapping program be started to determine the extent and boundaries of environmentally fragile areas.
3. A system for dynamic inventory of pesticide chemical stocks be developed.
4. USAID take an active role in assisting host countries in identifying alternate use or disposal of pesticide stocks. Refer to Recommendation 14.
5. FAO, as lead agency for migratory pest control, be requested to establish a system for the inventory of manpower, procedures, and equipment.

6. There be no pesticide application in environmentally fragile areas and human settlements.
7. Pesticides used be those with the minimum impact on nontarget species.
8. Pre- and post-treatment monitoring and sampling of sentinel organisms and water and/or soils be carried out as an integral part of each control campaign.
9. One of the criteria to be utilized in the selection of control techniques be a minimization of the area to be sprayed.
10. Helicopters be used primarily for survey to support ground and air control units. When aerial treatment is indicated, it should only be when very accurate spraying is necessary, such as close to environmentally fragile areas or for localized treatment.
11. Whenever possible, small planes be favored over medium to large two- or four-engine transport types. In all cases, experienced contractors will be used.
12. Any U.S. Government-funded locust/grasshopper control actions, which provide pesticides and/or commodities, or aerial or ground application services, include technical assistance and environmental assessment expertise as an integral component of the assistance package.
13. All pesticide containers be appropriately labeled.

High Priority, For Implementation When Resources Are Available

14. USAID provide assistance to host governments in disposing of empty pesticide containers and pesticides that are obsolete or no longer usable for the purpose intended.
15. USAID support the design, reproduction, and presentation of public education materials on pesticide safety (e.g., TV, radio, posters, booklets). This would include such subjects as, safely using cost effective pesticides, ecology, pest management of locusts and grasshoppers, and the hazards of pesticides. The goal would be to help policymakers and local populations recognize potential health problems related to pesticide applications.

¹TAMS Consultants, Inc. and the Consortium for International Crop Protection, "Locust and Grasshopper Control in Africa/Asia: A Programmatic Environmental Assessment, Executive Summary and Recommendations (Washington, DC: USAID) contractor report prepared for the U.S. Agency for International Development, March 1989, pp. EXSUM-34-53.

16. Training courses be designed and developed for health personnel in all areas where pesticides are used frequently.
17. Each health center and dispensary located in an area where pesticide poisonings are expected to occur be supplied with large wall charts in which the diagnosis and treatment of specific poisonings are depicted. The centers and dispensaries should also be provided, prior to spraying, with those medicines and antidotes required for treatment of poisoning cases.
18. Presently available tests for monitoring human exposure to pesticides be evaluated in the field. This includes measurement of cholinesterase levels in small samples of blood as a screening test.
19. The specifications developed for USAID purchase of locust/grasshopper insecticides be adapted for all insecticides.
20. Pesticide container specifications be developed.
21. *Nosema* and other biological agents such as *Neem* be fieldtested under African and Asian conditions in priority countries.
22. A comprehensive training program be developed for USAID Mission personnel who have responsibility for control operations. This will involve a review of existing materials and those under development, in order to save resources.
23. Local programs of training be instituted for pesticide storage management, environmental monitoring and public health (see Recommendation 16).
24. When technical assistance teams are provided, they be given short term intensive technical training (including language, if necessary) and some background in the use and availability of training aids.
25. Field research be carried out to generate badly needed economic data on a country-by-country basis.
26. No pesticide be applied unless the provisional economic threshold of locusts or grasshoppers is exceeded.
27. USAID provide assistance to host countries in drawing up regulations on the registration and management of pesticides and the drafting of environmental policy.

28. A pesticide use inventory covering all treatments in both agricultural and health programs be developed, on a country-by-country basis.
29. USAID produce a regularly updated pesticide handbook for use by its staff.
30. That technical assistance, education and training, and equipment be provided crop protection services of host countries with a view to making the services eventually self sustaining.

Desirable, But Less Urgent

31. More pesticide storage facilities be built. Until that occurs, emergency supplies be pre-positioned in the United States.
32. USAID make a decision as to whether to continue funding forecasting and remote sensing or utilize the FAO's early warning program.
33. A series of epidemiologic case-control studies, within the countries involved in locust and grasshopper control, be implemented in areas of heavy human exposure to pesticides.
34. Applied research be carried out on the efficacy of various pesticides and growth retardants and their application.
35. Applied research be carried out on the use of *Neem* as an antifeedant.
36. Research be carried out to determine the best techniques for assessing the impacts of organophosphates used for locust and grasshopper control "in relation" to the use of these and other chemicals for other pest control programs.

Procedures To Accelerate Implementation Of All Recommendations

37. USAID, on the basis of the previous Recommendations, develop a plan of action with practical procedures to provide guidance in locust/grasshopper control to missions in the field.
38. Detailed guidelines be developed for USAID to promote common approaches to locust and grasshopper control and safe pesticide use among UN Agencies and donor nations. Coordination of efforts is becoming increasingly important because of the increasing number and magnitude of multilateral agreements and follow up efforts in subsequent years by various donors.

SECTION II

RECOMMENDATIONS FROM THE AFRICA EMERGENCY LOCUST/GRASSHOPPER ASSISTANCE (AELGA) MID-TERM EVALUATION²

Set 1: Emergency Control Operations

Emergency control operations succeed or fail on the efficacy of their logistics.

- a. Implement, either directly through the AELGA project or indirectly through the USDA Resource Services Support Agreement (RSSA), short-term (6-7 months) technical assistance in entomology to the missions that still lack this expertise.
- b. Expand the pesticide bank to include other acceptable chemical and biological agents besides the carbaryl and malathion that are presently available.
- c. Maintain a current file of firms that provide aerial spraying services and pesticide transport, with aircraft type, availability and cost.
- d. Continue the present RSSA with USDA for the provision of greenness maps and for the provision of short-term technical assistance in map interpretation.
- e. Continue the present RSSA with USDA for the provision of long- and short-term technical assistance for locust surveys and control operations.
- f. Work with the appropriate African regional organizations, such as OCLALAV and CILSS, for the conclusion of interstate agreements on flyer rights for the movement of survey aircraft, fly over rights for cross-border locust control operations, the transport of pesticides and other agents among member states, and other such regional issues that have impeded locust control from time to time.

Set 2: Development Actions for the Short-term

AELGA should provide whatever assistance that USAID mission require in their locust control programs. Training courses are more traditional institution-building activities. The topics for these training courses, which must emphasize field-level concerns are (in addition to the courses now being delivered by AELGA on locust and grasshopper identification, ultra-low volume aerial application and crop-loss assessment):

- a. Management of logistical operations, for supervisors.
- b. Health concerns for locust control operations, for health personnel and locust control supervisors, as well as for pesticide handlers.
- c. Strengthening of farmer brigades and of the crop protection services terrestrial teams.
- d. Techniques for proper storage of pesticides and their containers.
- e. Cumulative effects of pesticide use on the environment, a regional conference for senior government personnel.

Set 3: Long-term Actions for Locust Control Forecasting, Institution-building and Research

The [AELGA] project should focus its efforts during its remaining life on those longer-term development aims that have the potential of assisting future locust control efforts and that complement ongoing activities.

- a. Work with the international organizations, in particular the FAO, that are developing a locust forecasting capability.
- b. Work through USAID/AFR/SWA with African regional organizations, such as OCLALAV, CILSS (INSA), and AGHYMET, in, respectively the development of training materials and the coordination of crop protection services (which are charged with locust survey and control); the coordination of logistical considerations (such as flyer rights); and, the provision of meteorological information. . . . While it may be necessary to continue to fund these activities through the FAO in the short-term, that organization must be required to collaborate closely with the regional organizations and a portion of the FAO grant moneys could be earmarked for this purpose.
- c. Coordinate the work being done by bilateral USAID missions in locust control and crop protection and facilitate the improvement of locust survey and control activities in national crop protection services, as requested by the concerned USAID missions.
- d. Develop the present economic cost/benefit analysis based on crop loss assessment for deciding when spraying operations are necessary.

²Tropical Research and Development, Inc. "Africa Emergency Locust/Grasshopper Assistance (AELGA) Mid-Term Evaluation," contractor report prepared for U.S. Agency for International Development (Washington, DC: USAID), July 15, 1989.

- e. Institute an environmental monitoring (perhaps in conjunction with other monitoring efforts) and health safety program (e.g., application procedures, drum disposal methods).

Set 4: Considerations in (AELGA) Project Management

- a. Retain AFR/Office of Technical Resources as the project location within AID.
- b. Take immediate steps to put in place the implementation mechanisms suggested in Recommendation Set 1 above.
- c. Design a longer-term development program along the lines of Recommendation Sets 2 and 3.
- d. Review the use of agreements with USG and the international agencies for emergency operational activities such as the *procurement* of services and commodities for the control of locust outbreaks.
- e. Computerize the project monitoring system to track project activities.
- f. Exert closer control of all research activities to ensure that the activities are relevant to AELGA needs, responsive to mission concerns, and integrated with host country agency activities.
- g. An additional intern be funded through USDA/OICD RSSA to assist the present project manager and long-term technical adviser.

Set 5: Major Design Considerations in Locust Control Programs

Locust control is a long-term problem that requires international cooperation.

The recent and present emphasis on locust control through the actions of national crop protection services' will, if successful, provide only a partial solution to the long-term problem.

- Institutional strengthening of the national crop protection services is fundamentally necessary for locust control, particularly in agricultural areas.

- Nonetheless, a regional problem requires a regional response.

- . . . USAID's locust control strategy must remain flexible.. .to work with and through the FAO to carry out necessary locust forecasting and control operations while, at the same time, building national and regional response capability=

- While the mission buy-in mechanism can work successfully for normal development activities, it is ill-adapted for continued emergency disaster planning and implementation.

Set 6: The Need for a Follow-on Project

- a. Develop a follow-on umbrella pest management, crop protection, or food security project that will continue the on-going activities of locust control and, at the same time, strengthen the crop protection agencies in the concerned countries so that they are better able to assist small producers in achieving the benefits from improved agriculture that are now accruing.

SECTION III

RECOMMENDATIONS FROM THE REPORT OF THE COMMITTEE ON HEALTH AND ENVIRONMENT³

The Foreign Assistance Appropriations Act of 1987 charged USAID with forming a Committee on Health and Environment to examine opportunities to assist developing countries in the proper use of agricultural and industrial chemicals. The Committee, with help from the Conservation Foundation, submitted these 6 major recommendations to USAID, along with detailed suggestions for implementation:

1. USAID and other donors should work to strengthen and increase the number of constituencies in multiple sectors and levels of society which actively support safe and environmentally sound use of pesticides and industrial chemicals in developing countries.

³Conservation Foundation, *Opportunities to Assist Developing Countries in the Proper Use of Agricultural and Industrial Chemicals*, vol. 1, Final Report (Washington, DC: The Conservation Foundation), Feb. 18, 1988.

2. **USAID should enhance the effectiveness of its agricultural and health programs that affect or involve pesticide or chemical use.**
3. **USAID should increase its use of Integrated Pest Management (IPM) significantly, with the goal of making IPM its primary pest management approach. Achieving this goal will require improved implementation and more support for research and training, and would have a catalytic effect on other donors.**
4. **In cooperation with other U.S. agencies and the private sector, USAID should prepare a long-term plan for its role in preventing and mitigating problems associated with activities involving industrial chemicals in developing countries.**
5. **USAID should report to Congress every two years, beginning in 1989, on its progress toward implementing the recommendations in this report and on future opportunities to address pesticide and chemical issues in developing countries.**
6. **Congress should provide clear policy guidance to U.S. Government agencies regarding the provision to, and use of, agricultural and industrial chemicals in developing countries. The Executive Branch should then implement that policy in a consistent fashion.**