

UNITED STATES GOVERNMENT

# Memorandum

PD. AAQ-473

931000

1974 3000 49

TO : DS/PO, Mr. Robert Simpson

DATE: 21 July 1978

FROM : DS/AGR, Leon F. Hesser *LFH*

SUBJECT: Study Panel on Neglected Tropical Legumes and Leucaena - Additional Funds (Small Activity/Special Project Inputs)

The purpose of this memorandum is to request approval of additional funds totaling \$17,985 and a six month extension in order that the major works under the subject small activity can be completed as intended and currently approved.

Background: In the Spring 1976 DS/AGR initiated the subject small activity for the purpose of identifying among the 18,000 little known and under utilized legumes of the world, those neglected tropical legumes which had the greatest potential for alleviating world shortages of edible protein and skyrocketing fertilizer prices. Under the AID funded Task Order #17 BOA-AID/csd-2584 (current funding of \$57,000 for the period June 2, 1976 to August 31, 1978), the National Academy of Sciences (NAS) convened a study panel of international experts, which met in Hawaii and the Philippines during August 1976, to review, discuss, and prioritize an initial master list of neglected tropical legumes and leucaena. The NAS then used the findings of the study panel for further study and requests for additional inputs from scientists worldwide. The end result of this review process was to publish two reports (one on neglected tropical legumes in 10,000 copies and the other on leucaena in 7,000 copies) for distribution to interested scientists worldwide.

The report on Leucaena has been published and distributed. The initial printing of 7,000 copies has been exhausted in response to additional requests primarily from the LDCs. Leucaena, formerly a virtually unheard plant in tropical agriculture, is now beginning to appear regularly in agriculture literature and is receiving widespread attention through various research and developmental activities in the LDCs. Letters on this report from SAID mission directors and U.S. embassies in over 50 countries confirm the value of this type of publication abroad.

Problem: The report on neglected tropical legumes is not yet completed although it is currently undergoing a final edit. Typesetting, printing, proofreading, translation of summary materials, art work and distribution remains to be done. The draft manuscript has been recently reviewed by three technical people within DS/AGR who feel that the final report will certainly be very worthwhile and that it will become a widely used publication as has the report on leucaena. The current Task Order for this activity



has funds totaling \$57,000 and will expire on August 31, 1978. An additional \$17,985 and a six month extension is required in order to complete this work. NAS's proposal for this funded extension is attached.

Discussion and Justification: Although the purpose and end products of this small activity have not changed from those originally planned, the amount of work involved in achieving those ends has required far more effort than could have been conceived earlier. As work on the tropical legume report progressed, the amazing versatility and importance of these neglected species loomed larger than previously expected. The initial list of 250 species drawn up for the Study Panel was augmented by an additional 250 at the meeting in Hawaii. Later as the study progressed after the Hawaii meeting, 200 more species come to light through inputs from scientists worldwide.

Identification of hundreds of species recommended for priority inclusion was alone impressive. This meant that to convincingly cover the promise of tropical legumes, the size of the study had to be increased and the staff effort greatly expanded. For example producing the report has involved mailing worldwide 1,500 letters including questionnaires, additional information and photo requests, and draft chapters for review by appropriate research contacts.

Other costs for this report, in addition to the staff effort involved, have also increased. These costs include increased size of the report plus increases in the cost of printing and postage for distribution. A proposed budget is attached.

Although the original Task Order for this activity has already received one funded amendment and an unfunded one-year extension and the fact that DS/AGR is a little unhappy with the procedures and timing followed by NAS in submitting its recent request for additional funds and time, DS/AGR none-the-less, feels that the final report will be an excellent and very useful item, that the output clearly justifies granting additional support and therefore strongly concurs with NAS's request for additional funds and time extensions.

2

Recommendation: That you approve an additional \$17,985 and six month extension of the small activity entitled, "Study Panel on Neglected Tropical Legumes and Leucaena."

Approved B Chapman

Disapproved \_\_\_\_\_

Date 8/2/78

At \_\_\_\_\_ s:  
Re: Proposal for Additional Funds  
dated June 9, 1978  
Proposed Budget

Clearance:

DS/AGR/TSWM:LFrederick LF Date 7/21/78  
DS/AGR/TSWM:DPeterson DP Date 7/24/78  
DS/AGR:Mozynski MM Date 7/24/78  
DS/PO:CKassebaum CK Date 7/27/78

REVISED BUDGET

Study Panel on Neglected Tropical  
Legumes and Leucaena

Task Order #17 under BOA-AID/csd-2584

	<u>Current Funds Provided</u> FM: 6/2/76 TO: 8/31/78	<u>Additional Funds</u> FM:continuing TO: 2/28/79	<u>TOTAL</u> FM: 6/2/76 TO: 2/28/79
Travel & Transportation	\$21,820	\$ -	\$21,820
Communication & Shipping	4,850	3,985	8,835
Materials & Services (including publishing reports)	14,950	12,000	26,950
Indirect Costs	<u>15,380</u>	<u>2,000</u>	<u>17,380</u>
TOTAL	\$57,000	\$17,985	\$74,985

~~4/20/80~~

NATIONAL ACADEMY OF SCIENCES  
2101 CONSTITUTION AVENUE  
WASHINGTON, D. C. 20418

June 22, 1978

Ref No:	626-03
Office:	OST
	for AA/DS
	Signature
Due Date:	7/5
Copies To:	lww Bruce

DS/PO  
DS/AGR  
CM

Mr. Sander Levin  
Assistant Administrator  
Bureau for Development Support  
Agency for International Development  
SA-18, Rosslyn Plaza, Building C  
Washington, D.C. 20523

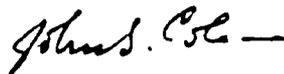
Dear Mr. Levin:

There is enclosed a proposal for additional support of the Academy's study on Neglected Tropical Legumes for the period ending February 28, 1979. The total funds requested, \$17,985 provide for the increased cost of printing and distributing the comprehensive study report and for a time extension of the current contract (No. AID/csd-2584, Task Order 17) to February 28, 1979.

Contract negotiations are the responsibility of our Business Manager, Mr. Bernard L. Kropp.

We shall appreciate your early consideration of this proposal.

Cordially,



John S. Coleman  
Executive Director

Enclosure

cc: Mr. Bernard L. Kropp  
Mr. W. Murray Todd  
Dr. Victor Rabinowitch  
Dr. Noel Vietmeyer  
Dr. John Malcolm

5

NATIONAL ACADEMY OF SCIENCES  
NATIONAL RESEARCH COUNCIL

Commission on International Relations

A PROPOSAL  
to the Agency for International Development for additional support of study on "Neglected Tropical Legumes."

Contract No.: AID/csd-2584, T.O. 17

This proposal is submitted by the National Academy of Sciences which assumes full technical and financial responsibility under its Act of Incorporation for the work to be carried out under any contract resulting from this proposal.

Contract Administration:



*fo*  
Bernard L. Kropp  
Business Manager  
National Academy of Sciences  
Telephone: 202/389-6211

Program Administration:

  
Victor Eabinowitch, Director  
Board on Science and Technology  
for International Development  
National Academy of Sciences  
Telephone: 202/389-6521

June 9, 1978

NATIONAL ACADEMY OF SCIENCES-NATIONAL RESEARCH COUNCIL

Summary

This proposal is submitted to the Agency for International Development to request additional funds for the publication and distribution of the report "Tropical Legumes: A Resource for the Future" which has been prepared by an ad hoc committee of the Board on Science and Technology for International Development's Advisory Committee on Technology Innovation. It is requested that \$17,985 be provided for the period ending February 28, 1979.

Background

The present study is one in a series that identifies unconventional scientific research with promise for developing countries. In each study, distinguished scientists pool their experience and knowledge in a report that includes their recommendations to decision makers. Previous publications include:

- The Winged Bean: A High Protein Crop for the Tropics
- Underexploited Tropical Plants with Promising Economic Value
- Making Aquatic Weeds Useful: Some Perspectives for Developing Countries
- Products from Jojoba: A Promising New Crop for Arid Lands
- Guayule: An Alternative Source of Natural Rubber
- More Water for Arid Lands: Promising Technologies and Research Opportunities.

The study of neglected tropical legumes was undertaken under Contract No. AID/csd-2584, T.O. 17. This task order also included provision for a study of

the particularly promising tree legume leucaena. A 115-page report Leucaena: Promising Forage and Tree Crop for the Tropics outlining the potential of this species was published in 1977. The initial printing of 7,000 copies has been exhausted in response to requests primarily from LDC's. Letters from USAID mission directors and U.S. embassies in over 50 countries confirm the value of this type of publication abroad.

On the implementation side, the name leucaena, formerly virtually unheard of in tropical agriculture, is now beginning to appear regularly in the literature and leucaena seems to be well on its way to getting a thorough trial. AID's Latin American Bureau has developed a PID concerning a multi-million dollar investigation of leucaena throughout Central American and the Caribbean. Various AID officers have introduced leucaena seed to countries in the Caribbean, and Africa. The U.S. Department of Agriculture has funded a major seed collection throughout Mexico and Guatemala by two U.S. plant scientists. The Centro Internacional de Agricultura Tropical (CIAT) in Cali, Colombia currently has a 3-man team working on development of leucaena as a forage, particularly for the acid soils, so prevalent in the tropics.

This activity has resulted from the leucaena publication that was part of the contract here under consideration. We believe that the other part--the tropical legumes study--will have equal or greater impact.

### Tropical Legumes

Of all plants used by man only the grasses are more important than the legumes. However, while enormous resources have been expended in recent decades on grasses like rice, wheat, corn, sorghum, and barley, among the legumes, only soybeans and peanuts have received much attention. Yet it is the

family Leguminosae that shows most promise for producing the vastly increased supply of vegetable protein that the world will need in the near future. In developing countries, especially, cultivation of legumes is the best and quickest way to augment the production of food proteins.

Of the 18,000 known legumes, less than 20 are used extensively today. Those include peanuts, soybeans, peas, lentils, pigeon peas, chick peas, mung beans, kidney beans, cowpeas, alfalfa, sweet clover (Melilotus species) other clovers (Trifolium species), and vetches. The remaining legumes are little used as yet, and many of them are almost unknown to science. Of these, the ones that show greatest promise are described in the NAS report.

The study so far

In July 1976 the NAS appointed a tropical legumes panel composed of 18 members from 10 countries. Panelists included botanists, agronomists and foresters (see attachment) with detailed knowledge of the native and cultivated plants of Latin America, Africa and Asia. They met at Kahului, Maui, Hawaii, in August 1976 to:

- ° identify leguminous plants, currently little-known and underutilized, that could improve the well-being of people in developing countries;
- ° select the species with the greatest incipient value; and
- ° indicate what needs to be done to capitalize on these plants and to develop them to their potential.

Prior to the panel's meeting, a list of 150 neglected and seemingly promising legumes was mailed to plant scientists throughout the world. Each recipient was asked to "vote" for the species most worthy of inclusion in the panel's report. About 150 scientists responded, and, at the same time nomi-

nated an additional 250 species for consideration. In a total of about 400 species, almost 200 received top ranking from at least one reviewer. Furthermore as the study progressed a further 200 species with promise came to light. From these candidates the panel selected the species that are included in the 30 chapters of this book.

#### The report

The report describes plants of the family Leguminosae, all of them underexploited. Some are valuable and extensively used in one part of the world but unknown elsewhere; others are virtually unknown to science but have particular attributes that suggest they could become major crops in the future; a few are already widespread but their possibilities are not yet fully realized.

Most of the plants described have the capacity to provide their own nitrogenous fertilizer through bacteria that live in nodules on their roots, the bacteria chemically convert nitrogen gas from the air into soluble compounds that the plant can absorb and utilize. As a result, legumes generally require no additional nitrogenous fertilizer for average growth. Commercial nitrogenous fertilizers are now staggeringly expensive for peasant farmers. This report demonstrates, how developing countries, by using leguminous plants, can grow useful crops while minimizing this expense.

The report covers: root crops, pulses, fruits, tree and shrub forages, fast growing trees, luxury timbers, ornamentals, fibers, gum producing species, as well as legumes for soil reclamation and erosion control. A table of contents is appended. Great emphasis has been placed on species that provide a range of products.

All the report's chapters have been reviewed by their respective research contacts. This has involved correspondence with about 600 botanists and agronomists in about 70 countries. As a result the text contains a great amount of unpublished data that cannot now be found in print.

In the report 36 species get major attention. An additional 57 species are also mentioned. Each species described has potential to help improve the quality of life in developing countries. Yet the promise of each is now little recognized by farmers and researchers.

The report is an introduction to the plants selected. For the convenience of the reader, most of the plants are presented in separate chapters, each arranged in the following general order:

- Description of the plant and of its advantages
- Limitations and special requirements
- Research needs
- Selected readings (significant reviews and general articles)
- Research contacts and germ plasm sources (individuals or organizations involved in relevant research who have agreed to provide small amounts of seed and advice to bona fide researchers.

The names and addresses of sources for seed and advice are given for more than 100 species. Thus readers will be able to follow-up the report by writing to these contacts. Each contact (and there are over 600 of them) has agreed to serve in this capacity.

Photographs of most plants mentioned in the book will be included. Many of the expected 150 pictures are already in hand, others should arrive soon.

### Proposal

It is requested that additional funds be provided to complete the report, "Tropical Legumes: A Resource for the Future." This report is currently undergoing a final edit. The funds are required to cover:

- ° typesetting and printing
- ° proofreading
- ° translations of summary material in French and Spanish
- ° collection and reproduction of photographs and drawings, separation of color prints, and conversion of color slides to black and white prints
- ° postage for distribution of 10,000 copies of the report
- ° art work for cover

The report will be over 300 pages with about 150 photographs, of which 40 will be in color. Like the former studies in this series it will have perforated tear-out mailers to improve distribution to the most appropriate recipients in developing countries.

### Justification

As the study progressed the almost amazing versatility and importance of these neglected species loomed larger than previously expected. To give each plant the attention it deserved required far more effort than could have been earlier conceived. The identification of hundreds of species recommended for priority inclusion alone was impressive. This meant that to convincingly cover the promise of tropical legumes the size of the study had to be increased and the staff effort greatly expanded.

12

For example, producing this report has involved mailing about 1,500 letters. This included a questionnaire which sought recommendations on species to be included in the study (300 questionnaires were sent out and about 150 responses were received). Other mailings have involved requests for information, literature as well as sending chapter drafts to appropriate research contacts for review and correction as well as sending out requests for photographs. Major data banks were searched by computer for literature pertaining to each plant in the report (and for many species that were discarded as the study progressed).

Due to the increased size and complexity, plus increases in the cost of printing and postage additional funds are needed to complete the printing and distribution of the report.

It is expected that the book will be ready for distribution by November/December 1978. Additional time to February 28, 1979 is required to process printing and distribution expenses.

NATIONAL ACADEMY OF SCIENCES-NATIONAL RESEARCH COUNCIL

Commission on International Relations

Study on Neglected Tropical Legumes

May 1, 1978 - February 28, 1979

Communications and Shipping	\$ 4,300
Materials and Services	26,188
Indirect Costs	3,656
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TOTAL	\$54,144*
Balance available 5/1/78	16,159
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Additional amount needed thru 2/28/79	\$17,985
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\* It is understood that the contract will provide for advance payments.

14

Panel on Underexploited Tropical Legumes

KENNETH O. RACHIE, Associate Director General Research, Centro Internacional  
de Agricultura Tropical, Cali, Colombia Chairman

J. P. M. BRENNAN, Director, Royal Botanic Gardens, Kew, Richmond, Surrey,  
England

JAMES L. BREWBAKER, Professor of Horticulture and Genetics, Department of  
Horticulture, University of Hawaii, Honolulu, Hawaii

JAMES A. DUKE, Chief, Plant Taxonomy Laboratory, Agricultural Research Station,  
United States Department of Agriculture, Beltsville, Maryland

E. MARK HUTTON, Chief, Division of Tropical Crops and Pastures, Commonwealth  
Scientific and Industrial Research Organization, St. Lucia, Queensland,  
Australia

THEODORE HYMOWITZ, Professor, Plant Genetics, Department of Agronomy, University  
of Illinois, Urbana, Illinois

RAYMOND J. JONES, Senior Principal Research Scientist, Davies Laboratory,  
Townsville, Queensland, Australia

ROBERT C. KOEPPEN, Plant Taxonomist, United States Forest Products Laboratory,  
Madison, Wisconsin

JEAN H. LANGENHEIM, Professor and Chairman, Division of Natural Sciences,  
University of California, Santa Cruz, California

JORGE LEÓN, Head, Plant Genetics Resources Center, Centro Agrónomico Tropical  
de Investigación y Enseñanza, Turrialba, Costa Rica

JAMES C. MOOMAW, Director, Asian Vegetable Research and Development Center,  
Shanhua, Taiwan, Republic of China

B. N. OKIGBO, Assistant Director, Farming Systems Program, International  
Institute of Tropical Agriculture, Ibadan, Nigeria

A. M. PINCHINAT, Regional Director for Antillean Zone, Instituto Inter-  
americano de Ciencias Agricolas de la OEA, Santo Domingo, Dominican  
Republic

DONALD L. PLUCKNETT, Director of International Programs, Department of  
Agronomy and Soil Science, University of Hawaii, Honolulu, Hawaii

GUILLELMO SANCHEZ-RODRIGUEZ, Ingeniero agrónomo con especialidad en  
zootecnia, Banco de Mexico, Ciudad Altamirano, Guerrero, Mexico

SETIJATI SASTRAPRADJA, Director, Lembaga Biology National, Bogor, Indonesia

YUSUF N. TAMIMI, Soil Science, University of Hawaii, Agricultural Experi-  
ment Station, Hilo, Hawaii

CRAIG D. WHITESELL, Silviculturist, United States Forest Service, Honolulu,  
Hawaii

NOEL D. VIETMEYER, Professional Associate, National Academy of Sciences,  
Washington, D.C. Staff Study Director

MARY JANE ENGQUIST, Staff Assistant, National Academy of Sciences, Washington,  
D.C. Staff

TROPICAL LEGUMES: A RESOURCE FOR THE FUTURE

Table of Contents

<p>Introduction and Summary</p> <p>I ROOT CROPS</p> <p>Yam Beans (<u>Pachyrhizus erosus</u>)</p> <p>African Yam Bean (<u>Sphenostylis stenocarpa</u>)</p> <p>Other Root Crops</p> <p>    The Winged Bean (<u>Psopocarpus tetragonolobus</u>)</p> <p>    <u>Vigna</u> species</p> <p>    <u>Flemingia vestita</u></p> <p>    <u>Psoralea</u> species</p> <p>    <u>Apios americana</u></p> <p>    and others</p> <p>II PULSES</p> <p>Bambara Groundnut (<u>Voandzeia subterranea</u>)</p> <p>Morama Bean (<u>Tylosema esculentum</u>     (<u>Bauhinia esculenta</u>))</p> <p>Moth Bean (<u>Vigna aconitifolia</u>)</p> <p>Rice Bean (<u>Vigna umbellata</u>)</p> <p>Tepary Bean (<u>Phaseolus acutifolius</u>)</p> <p>Yeeb (<u>Cordeauxia edulis</u>)</p> <p>Jackbean and Swordbean (<u>Canavalia ensiformis</u>     and <u>C. gladiata</u>)</p> <p>Tropical Lima Bean (<u>Phaseolus lunatus</u>)</p> <p>Tarwi (<u>Lupinus mutabilis</u>)</p> <p>Lablab Bean (<u>Dolichos lablab</u>)</p> <p>III FRUITS</p> <p>Carob (<u>Ceratonia siliqua</u>)</p> <p>Tamarind (<u>Tamarindus indica</u>)</p> <p>IV FORAGES</p> <p>Forage Shrubs and Trees</p> <p>    <u>Leucaena leucocephala</u></p> <p>    <u>Desmodium</u> species (<u>D. gyroides</u>,         <u>D. nicaraguense</u>)</p> <p>    <u>Cassia sturtii</u></p> <p>    Honey locust (<u>Gleditsia triacanthos</u>)</p> <p><u>Acacia tortilis</u>, the umbrella thorn</p> <p>Other Forage Acacias</p> <p>    <u>Acacia aneura</u></p> <p>    <u>Acacia pendula</u></p> <p>    <u>Acacia victoriae</u></p> <p>    <u>Acacia albida</u></p> <p><u>Prosopis</u> species</p> <p>    <u>Prosopis affinis</u></p> <p>    <u>Prosopis alba</u></p> <p>    <u>Prosopis chilensis</u></p> <p>    <u>Prosopis juliflora</u></p> <p>    <u>Prosopis nigra</u></p> <p>    <u>Prosopis pallida</u></p> <p>    <u>Prosopis tamaruzo</u></p>	<p>V TIMBER AND WOOD PRODUCTS</p> <p><u>Acacia auriculiformis</u></p> <p><u>Albizia</u> species</p> <p><u>Sesbania grandiflora</u></p> <p>Other Fast Growing Trees</p> <p>    <u>Acacia mangium</u></p> <p>    <u>Acrocarpus fraxinifolius</u></p> <p>    <u>Calliandra calothyrsus</u></p> <p>    <u>Dalbergia sissoo</u></p> <p>    <u>Enterolobium cyclocarpum</u></p> <p>    <u>Mimosa bracteata</u></p> <p>    <u>Samanea saman</u></p> <p>    <u>Schizolobium</u> species</p> <p>    <u>Tipuana tipu</u></p> <p><u>Pterocarpus</u> species (<u>P. indicus</u> and others)</p> <p>Rosewoods (<u>Dalbergia nigra</u>, <u>D. retusa</u>,     <u>D. latifolia</u>)</p> <p><u>Intsia</u> species (<u>I. bijuca</u> and <u>I. palembanica</u>)</p> <p><u>Aframomium</u> (<u>Pericopsis elata</u>)</p> <p>VI OTHER</p> <p>Ornamentals</p> <p>    <u>Acacia</u> species</p> <p>    <u>Azadirachta indica</u></p> <p>    <u>Amherstia nobilis</u></p> <p>    <u>Bauhinia</u> species, Orchid Trees</p> <p>    <u>Bolusanthus speciosus</u>, Rhodesian Wisteria Tree</p> <p>    <u>Brownea</u> species</p> <p>    <u>Butea monosperma</u>, Flame of the Forest</p> <p>    <u>Cassia</u> species, Shower Trees</p> <p>    <u>Clathrus</u> species</p> <p>    <u>Colvillea racemosa</u></p> <p>    <u>Erythrina</u> species, Coral Trees</p> <p>    <u>Lysidice rhodostegia</u></p> <p>    <u>Macropisochanthus lauterbachii</u></p> <p>    <u>Maniltoa</u> species</p> <p>    <u>Moldenhaueria floribunda</u></p> <p>    <u>Mucuna</u> species</p> <p>    <u>Peltophorum</u> species</p> <p>    <u>Pithecellobium grandiflorum</u>, Lace Flower Tree</p> <p>    <u>Sabinea carinalis</u></p> <p>    <u>Saraca indica</u>, The Asoka</p> <p>    <u>Schotia brachypetala</u>, Tree Fuchsia</p> <p>    <u>Sophora</u> species, The Kowhais</p> <p>    <u>Strongylodon macrobotrys</u>, Jade Vine</p> <p>Sunn Hemp (<u>Crotalaria juncea</u>)</p> <p>Gums</p> <p>    <u>Acacia senegal</u></p> <p>    Other <u>Acacia</u> species</p> <p>    <u>Astragalus</u> species</p> <p>    <u>Sesbania aculeata</u></p> <p>Green Manure Soil Reclamation and Erosion Control</p>
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APPENDICES

- A. Comparative nutritional values
  - B. Contributors to the Study
  - C. Biographical Sketches of Panel Members
- Resumen en Español  
 Résumé en Français  
 INDEX OF SPECIES

JUL 11 1978

Dr. John S. Coleman  
Executive Director  
National Academy of Sciences  
2101 Constitution Avenue, N. W.  
Washington, D. C. 20418

Dear Dr. Coleman:

We have received your request for additional support to cover publication and distribution costs of the Academy study on Neglected Tropical Legumes covered under contract AID/csd-2584, Task Order 17.

Our Office of Agriculture is reviewing the proposal and the status of its budget to determine whether or not we might grant your request. The agricultural specialists are satisfied that additional support is justified on technical grounds. The availability of funds and pertinent regulations have still to be checked.

The AID Contract Office will contact your business manager as soon as a decision has been reached within AID.

Sincerely yours,

151

Stephen Joseph  
Acting Assistant Administrator  
for Development Support

Clearance: DS/AGR:LHesser W/S Date 7/5/78  
DS/AGR/TSWM:DPeterson SP Date 7/5/78

Drafted: DS/AGR/TSWM:JLMalcolm:ibg:7/5/78:EXT.58877

## memorandum

DATE: 14 July 1978

REPLY TO  
ATTN OF: DS/AGR/TSWM, John L. Malcolm

SUBJECT: NAS Request of Additional Funds

TO: DS/AGR, Dr. Leon F. Hesser

The National Academy of Sciences has made a formal request for extra money for completing the Neglected Tropical Legume project, Task Order #17, AID/csd-2584. The amount is \$17,985. They also ask for a time extension until February 28, 1979. I recommend that we grant both requests because the end product will be very worthwhile. I am a little unhappy with the procedure followed by NAS. They continued to spend money on developing the text of final publication long after it should have been apparent that the budget funds were insufficient and came to us only when there was no option but to supply additional money.

The output clearly justifies granting the additional support, however, Dr. Frederick, Dr. Sprague and I have reviewed the manuscript in draft and it will certainly be a widely used publication. It brings together information on a wide range of little known but useful plants. Perhaps even more significantly, it identifies scientists and laboratories working on these plants and sources of plant material.

With your authorization we will go ahead and process an amendment to the task order adding the \$17,985 and extending the completion date.

## Clearance:

DS/AGR/TSWM:LFrederick *LF* Date 7/14/78  
 DS/AGR/TSWM:DPeterson *DP* Date 7/14/78

*O.K. [Signature] 7/17/78*

