PD-AAQ-863 705-04
ISN 32158

JUL 5 1978

ACTION MEMORANDUM FOR THE ASSISTANT ADMINISTRATOR

THRU: DS/RES, Miloslav Rechcigl

FROM: DS/AGR, Leon F. Hesser

SUBJECT: Unsolicited Proposal from Texas A&M University dated April 6, 1978

Problem: Your approval is required for a small activity grant to Texas A&M University to conduct the proposed "Systems Analysis and Synthesis of Beef and Dairy-Beef Cattle Production" from approximately June 1, 1978 to October 31, 1979 with an estimated budget of $21,125.

Discussion: Dr. T.C. Cartwright, Texas A&M University has submitted a proposal for a grant to continue and extend the application of systems analysis to beef and beef-dairy production systems for LDC's.

The objectives of this project are:

1. To continue to simulate and examine existing beef and beef-milk production systems in Botswana in cooperation with the International Livestock Center for Africa ILCA,

2. To synthesize a stepwise progression program for the transformation of traditional production systems which have been demonstrated to be more efficient; progression process must accomodate the needs of individual cattle owners and of Botswana during the process.

3. To simulate, examine and synthesize beef and dairy-beef production systems for general situations common to developing countries and to publish the results.

4. To continue model development especially to interface with forage models and to more easily accomodate economic analysis.

The project leader, Dr. T.C. Cartwright, is eminently qualified to carry out this project. Dr. Cartwright and his co-workers at Texas A&M developed a cattle production systems model during the five year period from 1972-77 under a 211(d) grant. This model is comprehensive and biologically based so that it has the capability of simulating, with the use of appropriate local parameters, cattle production under any set of conditions. This model has been validated using widely ranging actual data. It has been applied to settings in Guyana, Colombia, Tanzania, Botswana and Texas.

The most extensive application of this approach has been in Botswana in collaboration with ILCA. It is now proposed that ILCA will continue to coordinate this program and will conduct the necessary economic analyses. Texas A&M proposes to conduct the systems analysis from the biological standpoint, through the use of simulations. In addition, students or prospective students from several developing countries have proposed to acquire data from their countries to simulate beef or dairy-beef production. Also ILCA has asked Texas A&M to cooperate with them in a systems analysis of beef production systems in Mali.

There are multiple factors that influence livestock productivity, and most of these are interdependent. Therefore, not only must the effects of individual variables and the interaction between these variables be measured within the total system, but also these same variables and interactions must be taken into consideration in the design of efficient production systems.

The proposed activity in systems analysis presents an excellent opportunity to utilize the technology and expertise that has been developed at Texas A&M in the analyses of livestock production systems and in the design of optimized beef and beef-dairy production systems. A significant portion of this technology and expertise was developed through support provided by 211(d) grants to Texas A&M and three other institutions that were engaged in a consortium effort

on tropical livestock production. The 211(d) grants were made to enhance the capability of these U.S. institutions in providing technical assistance to developing countries in the livestock development programs.

However, though Texas A&M does possess this capability, they of course cannot justify nor obtain Texas A&M Experiment Station funds to support modelling activites in developing countries.

JUSTIFICATION: The justification for AID support of this proposed systems analysis is (a) that it will provide data regarding livestock production variables and their interaction, data which is essential to the design of modern livestock production systems incorporating recent technology developments; (b) that it will extend technology and expertise recently developed through AID-financed activities; and (c) that the systems analysis product is currently sought by an AID-supported International Agricultural Research Center which does not have the capability to conduct the analysis itself but which is prepared to conduct coordinated related studies.

RECOMMENDATION: It is recommended that a Small Activity (Special Projects - Inputs) grant be made to Texas A&M for an amount not exceeding $22,000 for the purpose of conducting analyses, gaining more experience, improving the model, and teaching scientists from developing countries the concepts and tools of systems analysis applied to beef and dairy-beef production as described in the attached grant proposal.

APPROVED: Stephen J.

DISAPPROVED: _____

DATE: 7/13/78

Project No. 931-0001

TEXAS A&M UNIVERSITY
COLLEGE OF AGRICULTURE
COLLEGE STATION, TEXAS 77843

Department of
ANIMAL SCIENCE
Instruction — Research — Extension

April 6, 1978

Mr. Miroslav Rechcigel, Jr.
Director, A.I.D./T.A.B. Interregional
Research Staff
A.I.D., Department of State
Washington, D.C. 20523

Dear Mr. Rechcigel:

Attached is an unsolicited proposal for a grant to continue and extend application of systems analysis to beef and beef-dairy production systems for LDC's. The proposed activities relate directly to the evaluation and development of livestock production systems relevant for developing countries and is an extension of activities begun under an AID 211(d) grant. The attached is a proposal brief; more detail will be added as requested.

At present there is already a backlog of requests for application of our beef and dairy-beef production systems model. Essentially we are requesting a grant to cover expenses of data processing (computer), which is the principal expense, and of a trained, knowledgeable person to program and make the computer runs. The staff in our systems analysis group will be responsible for design and analysis of the simulations and for synthesis of new systems.

Since Dr. Ned Raun, AID/TAB, is most familiar with our former AID 211(d) grant entitled "Expanding Competence in the Design and Execution of Livestock Development Programs in the Tropics Emphasizing Ruminant Livestock Production Systems through Improved Breeding and Disease Control" and with our present activities, I am sending him a copy of this proposal.

Sincerely,

T. C. Cartwright

T. C. Cartwright
Professor

TCC:ams

cc: Dr. Ned Raun

Tel. no. T. C. Cartwright: 713/845-2616

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A Grant Proposal
entitled

Systems Analysis And Synthesis of Beef and Dairy-Beef Cattle Production

submitted to

Agency for International Development,
Development Support Bureau

submitted by

The Texas Agricultural Experiment Station,
The Texas A&M University System

ENDORSEMENTS:

T. C. Cartwright, Project Leader, Professor, Department of Animal Science — 4-6-78 Date

Z. L. Carpenter, Acting Head, Department of Animal Science — 4-6-78 Date

H. O. Kunkel, Dean, College of Agriculture — 4-7-78 Date

Neville P. Clarke, Director, Texas Agricultural Experiment Station — 4/7/78 Date

E. Paul Creech, Director, International Programs Office — 4-6-78 Date

Jarvis E. Miller, President, Texas A&M University — 4-7-78 Date

TITLE: Systems Analysis And Synthesis Of Beef And Dairy-Beef Cattle Production

PROJECT LEADER:
T. C. Cartwright, Professor, Animal Science Department

CO-WORKERS:
D. E. Farris, Professor, Department of Agricultural Economics
T. C. Nelsen, Research Associate, Animal Science Department
J. O. Sanders, Assistant Professor, Animal Science Department
C. R. Long, Associate Professor, Animal Science Department

Summary of Budget Request for June 1, 1978 to October 31, 1979

Data Processing	
Simulation runs	$ 8,000
Model development	2,000
Research Associate; Model programmer	
T. C. Nelsen, 1/2 time, 15 months, @$12,000/year	7,500
Fringe benefits (13.5%)	1,000
Overhead (15%)	2,625
Total	$21,125

Texas A&M would provide all office and other facilities required to conduct these activities and the equivalent of approximately 1 professional year

OBJECTIVES:
1. To continue to simulate and examine existing beef and beef-milk production systems in Botswana in cooperation with the International Livestock Center for Africa.
2. To synthesize a stepwise progression program for the transformation of traditional production systems to systems which have been demonstrated to be more efficient; progression process must accomodate the needs of individual cattle owners and of Botswana during the process.
3. To simulate, examine and synthesize beef and dairy-beef production systems for general situations common to developing countries and to publish the results.
4. To continue model development especially to interface with forage models and to more easily accomodate economic analysis.

Rationale and Procedure

T. C. Cartwright and coworkers at Texas A&M University developed a cattle production systems model during the five year period from 1972-1977 under an AID 211(d) grant. This model is comprehensive and biologically based so that it has the capability of simulating, with use of appropriate local parameters, cattle production under any set of conditions. This model has been validated using widely ranging actual data. It has been applied to settings in Guyana, Colombia, Tanzania, Botswana and Texas.

The general approach has been to simulate local, existing conditions for use in validation and to provide baselines for comparisons. Next, an intervention, or a series of interventions, are simulated to examine the effect of the intervention on the total production systems, not just a segment. In this manner, with successive simulation runs, and review by animal scientists, sociologists and economists (with specific economic analysis applied to the simulation output), a set of practices can

be developed which tend to optimize the various inputs and adjustments to production systems which will meet the specific objective function such as to maximize profit for the producer, to maximize export beef production, to maximize protein production, to optimize the amount of milk taken from dairy-beef cows, etc. within a given set of constraints such as limited transportation, long distances between drinking water, minimal risks in any one year to a producer in an area subject to drowth, etc.

The general approach has been applied in several areas, as mentioned above, but the most extensive application has been in Botswana. In 1977, a team from ILCA consisting of a Ph.D. Animal Scientist and a Ph.D. Agricultural Economist were trained at Texas A&M regarding interpretation and use of output of the model. Later a team of two from Texas A&M, followed by a third, visited Botswana as consultants to ILCA to gather data and set up a systems analysis of beef and dairy-beef production in Botswana. These activities took place in 1977 while the AID 211(d) grant was in effect. In March of 1978 the Texas A&M team returned to Botswana to present a set of simulations and propose a more complete study, with economic analyses, of Botswana dairy-beef production systems. This proposal was reviewed during a week's workshop and accepted. The proceedings of the workshop will be published by ILCA. ILCA will take the responsibility of coordinating this program and conducting the economic analyses. Texas A&M proposes to conduct the systems analysis from the biological standpoint, through use of simulations. The situation in Botswana is very favorable for systems analysis application as proposed. First, a excellent data base has been accumulated, analyzed and published in technically usable form. Second, personnel in the Animal Production Research Unit and other parts of the Ministry of Agriculture are capable and anxious to proceed. Third, Botswana has the definite potential to increase production efficiency and has a market for beef in Europe unique for an African country.

In addition, students, or prospective students, from several developing countries have proposed to acquire data from their countries to simulate beef or dairy-beef production. Also ILCA has asked Texas A&M to cooperate with them in a systems analysis of beef production systems in Mali.

The funds requested will be used to conduct these analyses, to gain more experience, to improve the model and to teach others from developing countries the concepts and tools of systems analysis applied to beef and dairy-beef production.