U.S. AGENCY FOR
INTERNATIONAL
DEVELOPMENT

SEP 2 1 1993

Kofi Bota, Ph. D.
Vice President for Research
& Sponsored Programs
Clark Atlanta University
223 James P. Brawley Drive at
Fair Street
Atlanta, GA 30314

SUBJECT: Grant No. PCE-5053-G-00-3060-00

Dear Dr. Bota:

Pursuant to the authority contained in the Foreign Assistance Act of 1961 and the Federal Grant and Cooperative Agreement Act of 1982, as amended, the Agency for International Development (hereinafter referred to as "A.I.D.") hereby provides to Clark Atlanta University (hereinafter referred to as "Clark Atlanta" or "Grantee") the sum set forth in Section 1C.2. of Attachment 1 of this Grant to provide financial support for the program described in Attachment 2 of this Grant entitled "Program Description."

This Grant is effective as of the date of this letter and funds obligated hereunder shall be used to reimburse the Grantee for allowable program expenditures for the period set forth in Section 1B. of Attachment 1 of this Grant.

This Grant is made to the Grantee on the condition that the funds will be administered in accordance with the terms and conditions as set forth in the attachments listed under my signature below, which together constitute the entire Grant document and have been agreed to by your organization.

Please acknowledge receipt and acceptance of this Grant by signing all copies of this Cover Letter, retaining one copy for your files, and returning the remaining copies to the undersigned.

If you have any questions, please contact Ms. Gail Warshaw of my staff at (703) 875-1266.

Sincerely yours,

Gary V. Kinney
Grant Officer
Chief, OP/B/PCE
Office of Procurement

Attachments:

1. Schedule
2. Program Description
3. Standard Provisions

ACKNOWLEDGED:

CLARK ATLANTA UNIVERSITY

BY: _____

TYPED NAME: Kofi B. Bota

TITLE: Vice President for Research

DATE: 9/29/93

FISCAL DATA

A. GENERAL

A.1. Total Estimated A.I.D. Amount: $100,000
A.2. Total Obligated A.I.D. Amount: $100,000
A.3. Cost-Sharing Amount (Non-Federal): $2,880
A.4. Other Contributions (Federal): $ N/A
A.5. Project No.: 936-5053
A.6. A.I.D. Project Office: R&D/UC, David Rakes
A.7. Funding Source: A.I.D./W
A.8. Tax I.D. No.: 1-58-1825259A1
A.9. CEC No.: 06-5325177
A.10. LOC No.: 72-00-1537

B. SPECIFIC

B.1.(a) PIO/T No.: 936-5053-3692952
B.1.(b) Appropriation: 72-1131021.1
B.1.(c) Allotment: 341-36-099-00-20-31
B.1.(d) BPC: DDVA-93-16900-KG11
B.1.(e) Amount: $100,000

ATTACHMENT 1

SCHEDULE

1A. PURPOSE OF GRANT

The purpose of this Grant is to provide financial support for the program described in Attachment 2 of this Grant entitled "Program Description."

1B. PERIOD OF GRANT

The effective date of this Grant is the date of the Cover Letter and the estimated completion date is September 29, 1995. Funds obligated hereunder (see Section 1C.2. below) shall be used to reimburse the Grantee for allowable program expenditures incurred by the Grantee in pursuit of program objectives during such period. Funds obligated hereunder are anticipated to be sufficient for completion by the Grantee of the program described in Attachment 2 of this Grant by the estimated completion date.

1C. AMOUNT OF GRANT AND PAYMENT

1C.1. The total estimated amount of this Grant for its full period, as set forth in Section 1B. above, is $100,000.

1C.2. A.I.D. hereby obligates the amount of $100,000 for the purposes of this Grant during the indicated period set forth in Section 1B. above, thereby fulfilling A.I.D.'s funding requirements. A.I.D. shall not be liable for reimbursing the Grantee for any costs in excess of the obligated amount, except as specified in paragraph (f) of the Standard Provision of this Grant entitled "Revision of Grant Budget."

1C.3. Payment shall be made to the Grantee in accordance with procedures set forth in the Standard Provision of this Grant entitled "Payment - Letter of Credit," as shown in Attachment 3.

1C.4. The total estimated amount of the program described in Attachment 2 of this Grant is $102,880, of which A.I.D. may provide the amount specified in Section 1C.1. above, and the Grantee will provide $2,880 in accordance with Section 1L. below.

1D. GRANT BUDGET

1D.1. The following is the Budget for the total estimated

amount of this Grant (see Section 1C.1. above) for its full period (see Section 1B. above). The Grantee may not exceed the total estimated amount or the obligated amount of this Grant, whichever is less (see Sections 1C.1. and 1C.2., respectively, above). Except as specified in the Standard Provision of this Grant entitled "Revision of Grant Budget," as shown in Attachment 3, the Grantee may adjust line item amounts as may be reasonably necessary for the attainment of program objectives. Revisions to the budget shall be in accordance with Section 1C. above and the Standard Provisions of this Grant entitled "Revision of Grant Budget" and, if applicable, "Cost Sharing (Matching)."

1D.2. Budget

Cost Element	A.I.D.	Grantee/ Others (Non-Fed)	Grantee/ Others (Federal)	Total
Cost Element				
Salaries	$ 30,504	$ 2,880	$ - 0 -	$ 33,384
Fringe Benefits	6,505	- 0 -	- 0 -	6,505
Consultants	16,300	- 0 -	- 0 -	16,300
Indirect Costs	16,777	- 0 -	- 0 -	16,777
Travel and Per Diem	17,220	- 0 -	- 0 -	17,220
Nonexpendable Equipment	2,500	- 0 -	- 0 -	2,500
Other Direct Costs	10,194	- 0 -	- 0 -	10,194
TOTAL	$100,000	$ 2,880	- 0 -	$102,880

1D.3. Inclusion of any cost in the budget of this Grant does not obviate the requirement for prior approval by the Grant Officer of cost items designated as requiring prior approval by the applicable cost principles (see the Standard Provision of this Grant set forth in Attachment 3 entitled "Allowable Costs") and other terms and conditions of this Grant, unless specifically stated in Section 1I. below.

1E. **REPORTING**

1E.1. Financial Reporting

1E.1.(a) Financial reporting requirements shall be in accordance with the Standard Provision of this Grant entitled "Payment - Letter of Credit," as shown in Attachment 3. If a Standard Form 269 is required by the aforesaid Standard Provision, the "Long Form" of said form shall be used.

1E.1.(b) All financial reports shall be submitted to A.I.D., Office of Financial Management, FA/FM/CMPD/DCB, Room 700 SA-2, Washington, D.C. 20523-0209. In addition, three copies of all financial reports shall be submitted to the A.I.D. Project Office specified in the Cover Letter of this Grant, concurrently with submission of the Quarterly Technical Reports (See Section 1E.2. below).

1E.1.(c) The frequency of financial reporting and the due dates of reports shall be as specified in the Standard Provision of this Grant referred to in Section 1E.1.(a) above.

1E.1.(d) The Grantee's financial reports shall include expenditures of A.I.D. Grant funds provided hereunder, as well as non-federal matching funds and any other contributions in accordance with Section 1L. below.

1E.2. Program Performance Planning and Reporting

1E.2.(a) Quarterly Reports

The Grantee shall submit five (5) copies of brief quarterly program performance reports, which coincide with the financial reporting periods described in Section 1E.1. above, to the A.I.D. Project Office specified in the Cover Letter of this Grant. In addition, two copies shall be submitted to A.I.D., POL/CDIE/DI, Washington, DC 20523-1802. These reports shall be submitted within 30 days following the end of the reporting period, and shall briefly present the following information:

1E.2.(a)(1) A comparison of actual accomplishments with the goals established for the period, the findings of the investigator, or both. If the output of programs can be readily quantified, such quantitative data should be related to cost data for computation of unit costs.

1E.2.(a)(2) Reasons why established goals were not met, if applicable.

1E.2.(a)(3) Other pertinent information including the status of finances and expenditures and, when appropriate, analysis and explanation of cost overruns or high unit costs. See also Section 1I.4. of this Grant.

1E.2.(b) Special Reports

Between the required program performance reporting dates, events may occur that have significant impact upon the program. In such instances, the Grantee shall inform the A.I.D. Project Officer as soon as the following types of conditions become known:

1E.2.(b)(1) Problems, delays, or adverse conditions that will materially affect the ability to attain program objectives, prevent the meeting of time schedules and goals, or preclude the attainment of work units by established time periods. This disclosure shall be accompanied by a statement of the action taken, or contemplated, and any A.I.D. assistance needed to resolve the situation.

1E.2.(b)(2) Favorable developments or events that enable time schedules to be met sooner than anticipated or more work units to be produced than originally projected.

1E.2.(b)(3) If any performance review conducted by the Grantee discloses the need for change in the budget estimates in accordance with the criteria established in the Standard Provision of this Grant entitled "Revision of Grant Budget," the Grantee shall submit a request for budget revision to the Grant Officer and the A.I.D. Project Officer specified in the Cover Letter of this Grant.

1E.2.(c) Environmental Impact

If it appears that outputs of this project will result in an adverse environmental impact, the Grantee shall notify the A.I.D. Project Officer prior to implementation, in order to allow for orderly preparation of an environmental impact statement. The Grantee shall assure that appropriate U.S. Government, A.I.D., and/or host country procedures are followed.

1E.2.(d) Training Reports

1E.2.(d)(1) If the Grantee conducts participant training under this Grant, (see the Standard Provision entitled "Participant Training" for the definition of participant training), the Grantee shall comply with reporting and information requirements of the Standard Provision of this Grant entitled "Participant Training," as well as Chapters 5 and 24 of A.I.D. Handbook 10.

1E.2.(d)(2) The Grantee shall also provide five (5) copies of quarterly training reports to the A.I.D. Project Officer, covering this Grant. The report shall include the following information:

- Total number of new trainees during the period; and
- The following information for each LDC trainee:
  - name

- citizenship
- gender
- training site
- beginning and ending dates of training
- purpose of training
- type of training activities
- source of funding

1E.2.(d)(3) The Grantee shall provide ten (10) copies of all training manuals produced under this Grant to the A.I.D. Project Officer.

1E.2.(e) Technical and Research Reports and Publications

The Grantee shall summarize technical and research activities of the project in reports, and distribute such reports to the appropriate USAID Missions, developing countries, and host country and international institutions in order to encourage use of the technology developed. Such reports will be completed within 60 days after completion of the activity. Journal articles and other publications are encouraged. See also the Standard Provision of this Grant entitled "Publications" (if the Grantee is a U.S. organization) or "Publications and Media Releases" (if the Grantee is a non-U.S. organization).

1E.2.(f) Final Report

Within 90 days following the estimated completion date of this Grant (see Section 1B. above), the Grantee shall submit five (5) copies of a final report to the A.I.D. Project Office specified in the cover letter of this Grant. In addition, two copies shall be submitted to A.I.D., POL/CDIE/DI, Washington, DC 20523-1802. It will cover the entire period of the Grant and include all information shown in this Section 1E.2., specifically including, but not necessarily limited to: (1) a summarization of the program's accomplishments or failings; (2) an overall description of the activities under the program during the period of this Grant; (3) a description of the methods of work used; (4) comments and recommendations regarding unfinished work and or program/continuation and direction; and 5) A fiscal report that describes in detail how the Grant (and any matching) funds were used.

1E.2.(g) Trip Reports

Within 30 days following the completion of each international trip, the Grantee shall submit 3 copies of a trip report summarizing the accomplishments of the trip to the A.I.D. Project Officer specified in the cover letter of this Grant.

If several individuals are travelling together to one site, a single report representing the group will suffice. The report shall include the purpose of the trip, technical observations, suggestions and recommendations, overall impressions of the site situation (if appropriate), and a list of persons visited with their title and organization affiliation.

1E.2.(h) Annual Activity Reports

Within thirty (30) days following the annual anniversary date of this Grant, the Grantee shall submit to the A.I.D. Project Office specified in the cover letter of this Grant five (5) copies of an annual technical progress report which will be a description of the past year's activities, including technical, scientific, managerial, and fiscal information. The report shall include, both for each field site or subcontractor/subrecipient individually and for project activities as a whole, a review of program and problems to date, and a discussion of technical and managerial issues significant to the success or failure of this Grant. The report will also address regulatory issues related to the project. Although principally a technical document, it nevertheless must include pertinent statistics or quantitative information regarding the project and its activities. An Impact Analysis Report will be appended to this report, which will be considered an instrument for Technology Transfer. The Impact Analysis Report will summarize and provide a feedback system for measurement and evaluation of the impact of the Grantee's activities in the public and private sector. The impact analysis will generally be qualitative in nature, and quantified only as appropriate. The Annual Activity Report shall also include an annual expenditure report corresponding to each annual workplan (see Section 1E.2.[b] above). These expenditure reports will cover A.I.D. and, if applicable, cost-sharing amounts by budget line item (see Section 1D.2. above) and by estimated distribution amongst project components, e.g., research, training, technical assistance, technology transfer, information dissemination, or networking.

1E.2.(i) Care of Laboratory Animals

If the Standard Provision entitled "Care of Laboratory Animals" applies to this Grant (see Section 1K. for applicability), the Grantee shall include the certificate required by paragraph (c) of said Standard Provision in all of its reports which pertain to the use of laboratory animals.

1E.2.(j) Research Involving Recombinant DNA

If any research involving recombinant DNA is being funded hereunder, the Grantee shall comply with the reporting requirements set forth in Section 1I.5. of this Grant.

1F. TITLE TO PROPERTY

Title to property acquired hereunder shall vest in the Grantee, subject to the requirements of the Standard Provision of this Grant entitled "Title To and Use of Property (Grantee Title)" regarding use, accountability, and disposition of such property, except to the extent that disposition of property may be specified in Section 1I. below.

1G. PROCUREMENT AND (SUB)CONTRACTING

1G.1. Applicability

This Section 1G. applies to the procurement of goods and services by the Grantee (i.e., contracts, purchase orders, etc.) from a supplier of goods and services (see the Standard Provisions of this Grant entitled "Air Travel and Transportation," "Ocean Shipment of Goods," "Procurement of Goods and Services," "AID Eligibility Rules for Goods and Services," and "Local Cost Financing"), and not to assistance provided by the Grantee (i.e., a subgrant or [sub]agreement) to a subrecipient (see the Standard Provision of this Grant entitled "Subagreements").

1G.2. Requirements

1G.2.(a) In addition to other applicable provisions of this Grant, the Grantee shall comply with paragraph (b)(1) of the Standard Provision of this Grant entitled "AID Eligibility Rules for Goods and Services," concerning Grants funded under the Development Fund for Africa (DFA) and Grants with a total procurement value of less than $250,000 under this Grant. However, paragraph (b)(1) of the Standard Provision entitled "AID Eligibility Rules for Goods and Services" does not apply to:

1G.2.(a)(1) The restricted goods listed in paragraph (a)(3) of the Standard Provision entitled "AID Eligibility Rules for Goods and Services," which must be specifically approved by the Grant Officer in all cases, except to the extent that such approval may be provided in Section 1I.3. below;

1G.2.(a)(2) Paragraph (d) of the Standard Provision entitled "AID Eligibility Rules for Goods and Services" pertaining to air and ocean transportation, to which the Standard Provisions entitled "Air Travel and Transportation" and "Ocean Shipment of Goods" apply, respectively;

1G.2.(a)(3) Paragraph (c) of the Standard Provision entitled "AID Eligibility Rules for Goods and Services;"

1G.2.(a)(4) Construction implemented by U.S. firms, regardless of dollar value, which requires that at least 50% of the supervisors and other specified key personnel working at the project site must be U.S. citizens or non-U.S. citizens lawfully admitted for permanent residence in the United States; and

1G.2.(a)(5) Engineering services, regardless of dollar value, which shall be limited to the United States (Geographic Code 000).

1G.2.(b) Paragraph (b)(2) of the Standard Provision entitled "AID Eligibility Rules for Goods and Services" does not apply.

1G.3. Approvals

Inclusion of costs in the budget of this Grant for the purchase of nonexpendable equipment obviates neither the requirement of Section J.13. of OMB Circular A-21 (for educational institutions) or Section 13 of Attachment B of OMB Circular A-122 (for nonprofit organizations other than educational institutions) for prior approval of such purchases by the Grant Officer, nor any other terms and conditions of this Grant, unless specifically stated in Section 1I.2. below.

1G.4. Title to Property

See Section 1F. above.

1H. **INDIRECT COST RATES**

1H.1. Pursuant to the Standard Provisions of this Grant entitled "Negotiated Indirect Cost Rates - Predetermined" and "Negotiated Indirect Cost Rates - Provisional (Nonprofits)," a predetermined indirect cost rate or rates shall be established for each of the Grantee's accounting periods which apply to this Grant. Pending establishment of predetermined indirect cost rates for the initial period (09/20/93 - 09/29/94), provisional payments on account of allowable indirect costs shall be made on the basis of the following negotiated provisional rate(s) applied to the base(s) which is (are) set forth below:

Type	Rate	Base
On-Campus/Home Office	55.0%	1/
Off-Campus/Off-Site	37.0%	1/

1/ Base of Application: Direct salaries and wages.

1H.2. Rates for subsequent periods shall be established in accordance with the Standard Provision of this Grant entitled "Negotiated Indirect Cost Rates - Predetermined."

1I. SPECIAL PROVISIONS

1I.1. Limitations on Reimbursement of Costs of Compensation for Personal Services and Professional Service Costs

1I.1.(a) Employee Salaries

Except as the Grant Officer may otherwise agree in writing, A.I.D. shall not be liable for reimbursing the Grantee for any costs allocable to the salary portion of direct compensation paid by the Grantee to its employees for personal services which exceed the highest salary level for a Foreign Service Officer, Class 1 (FS-1), as periodically amended.

1I.1.(b) Consultant Fees

Compensation for consultants retained by the Grantee hereunder shall not exceed, without specific approval of the rate by the Grant Officer: either the highest rate of annual compensation received by the consultant during any full year of the immediately preceding three years; or the maximum rate of a Foreign Service Officer, Class 1 (FS-1) (as periodically amended), whichever is less. A daily rate is derived by dividing the annual compensation by 2,087 and multiplying the result by 8.

1I.2. Equipment and Other Capital Expenditures

1I.2.(a) Requirement for Prior Approval

Pursuant to Sections 1D.3. and 1G.3. above and the Standard Provisions of this Grant entitled "Allowable Costs" and "Revision of Grant Budget," and by extension, Section J.13. of OMB Circular A-21, the Grantee must obtain A.I.D. Grant Officer approval for the following:

1I.2.(a)(1) Purchase of General Purpose Equipment, which is defined as an article of nonexpendable tangible personal property, the use of which is not limited only to research, medical, scientific, or other activities [e.g., office equipment and furnishings, air conditioning equipment, reproduction and other equipment, motor vehicles, and automatic data processing equipment, having a useful life of more than two years and an acquisition cost of $500 or more per unit);

1I.2.(a)(2) Purchase of Special Purpose Equipment, which is defined as an article of nonexpendable tangible personal property, which is used only for research, medical, scientific,

or other technical activities, and which has a useful life of more than two years and an acquisition cost of $1,000 or more per unit); and

1I.2.(a)(3) Other Capital Expenditures, which is defined as the cost of the asset, including the cost to put it in place).

1I.2.(b) Approvals

In furtherance of the foregoing, the Grant Officer does hereby provide approval for the following purchases, which shall not be construed as authorization to exceed the total estimated amount or the obligated amount of this Grant, whichever is less (see Section 1C. above):

1 Lap Top Computer with Software

1I.2.(c) Exception for Automation Equipment

Any approval for the purchase of automation equipment which may be provided in Section 1I.2.(b) above or subsequently provided by the Grant Officer is not valid if the total cost of purchases of automation equipment (e.g., computers, word processors, etc.), software, or related services made hereunder will exceed $100,000. The Grantee must, under such circumstances, obtain the approval of the Grant Officer for the total planned system of any automation equipment, software, or related services.

1I.2.(d) Compliance with A.I.D. Eligibility Rules

Any approvals provided in Section 1I.2.(b) above or subsequently provided by the Grant Officer shall not serve to waive the A.I.D. eligibility rules described in Section 1G. of this Grant, unless specifically stated.

1I.3. Restricted Goods

Pursuant to Section 1G. above and paragraph (a)(3) of the Standard Provision of this Grant entitled "AID Eligibility Rules for Goods and Services," the Grant Officer's approval is required for purchase of the restricted goods described therein. In furtherance thereof, the Grant Officer does hereby provide such approval to the extent set forth below. The Grant Officer's approval is required for purchases of such restricted goods if all of the conditions set forth below are not met by the Grantee. Any approval provided below or subsequently provided by the Grant Officer shall not serve to waive any terms and conditions of this Grant unless specifically stated.

1I.3.(a) Agricultural Commodities

Agricultural commodities may be purchased provided that they are of U.S. source (generally, the country from which the commodities are shipped) and origin (generally, the country in which the commodities are mined, grown, or produced) and purchased from a U.S. supplier, except that wheat, rice, corn, soybeans, sorghums, flour, meal, beans, peas, tobacco, hides and skins, cotton, vegetable oils, and animal fats and oils cannot be purchased under any circumstances without the prior written approval of the Grant Officer. However, if this Grant is funded under the Development Fund for Africa (DFA) (see Section 1G.2.[b][4] above), procurement of agricultural commodities from Special Free World countries (Geographic Code 935) is authorized, except that procurement of agricultural commodities outside the United States must have the advance written approval of the Grant Officer when the domestic price of the commodity is less than parity, unless the commodity cannot reasonably be procured in the U.S. in order to meet the needs of the project

1I.3.(b) Motor Vehicles

Motor vehicles, if approved for purchase under Section 1I.2.(b) above or subsequently approved by the Grant Officer, must be of U.S. manufacture and must be of at least 51% U.S. componentry. The source of the motor vehicles, and the nationality of the supplier of the vehicles, must be in accordance with Section 1G.2. above. Motor vehicles are defined as self-propelled vehicles with passenger carriage capacity, such as highway trucks, passenger cars and busses, motorcycles, scooters, motorized bicycles, and utility vehicles. Excluded from this definition are industrial vehicles for materials handling and earthmoving, such as lift trucks, tractors, graders, scrapers, and off-the-highway trucks. However, if this Grant is funded under the Development Fund for Africa (DFA) (see Section 1G.2.[b][4] above), procurement of motor vehicles from Special Free World countries (Geographic Code 935) is authorized; provided, however, that procurement of non-U.S. vehicles shall be held to an absolute minimum.

1I.3.(c) Pharmaceuticals

Pharmaceuticals may be purchased provided that all of the following conditions are met: (1) the pharmaceuticals must be safe and efficacious; (2) the pharmaceuticals must be of U.S. source and origin (see Section 1G. above); (3) the pharmaceuticals must be of at least 51% U.S. componentry (see Section 1G. above); (4) the pharmaceuticals must be purchased from a supplier whose nationality is in the U.S. (see Section

1G. above); (5) the pharmaceuticals must be in compliance with U.S. Food and Drug Administration (FDA) (or other controlling U.S. authority) regulations governing United States interstate shipment of pharmaceuticals; (6) the manufacturer of the pharmaceuticals must not infringe on U.S. patents; and (7) the pharmaceuticals must be competitively procured in accordance with the procurement policies and procedures of the Grantee and the Standard Provision of this Grant entitled "Procurement of Goods and Services."

1I.3.(d) Pesticides

Pesticides may only be purchased if the purchase and/or use of such pesticides is for research or limited field evaluation by or under the supervision of project personnel. Pesticides are defined as substances or mixtures of substances: intended for preventing destroying, repelling, or mitigating any unwanted insects, rodents, nematodes, fungi, weeds, and other forms of plant or animal life or viruses, bacteria, or other micro-organisms (except viruses, bacteria, or other micro-organisms on or living in man or other living animals); or intended for use as a plant regulator, defoliant, or dessicant.

1I.3.(e) Rubber Compounding Chemicals and Plasticizers

Rubber compounding chemicals and plasticizers may only be purchased with the prior written approval of the Grant Officer.

1I.3.(f) Used Equipment

Used equipment may only be purchased with the prior written approval of the Grant Officer.

1I.3.(g) Fertilizer

Fertilizer may be purchased if it is either purchased in the U.S. and used in the U.S., or if it is purchased in the cooperating country with local currency for use in the cooperating country. Any fertilizer purchases which do not comply with these limitations must be approved in advance by the Grant Officer. However, if this Grant is funded under the Development Fund for Africa (DFA) (see Section 1G.2.[b][4] above), procurement of fertilizer from Special Free World countries (Geographic Code 935) is authorized; provided, however, that procurement of more than 5,000 tons of non-U.S. fertilizer must have the advance written approval of the Grant Officer.

1I.4. Limitation on Use of Funds

1I.4.(a) The Grantee shall not utilize funds provided by A.I.D. for any testing or breeding feasibility study, variety improvement or introduction, consultancy, publication, conference or training in connection with the growth or production in countries other than the United States of an agricultural commodity for export which would compete with a similar commodity grown or produced in the United States.

1I.4.(b) The reports described in Section 1E.2. shall contain a statement indicating the projects or activities to which United States funds have been attributed, together with a brief description of the activities adequate to show that United States funds have not been used for the purpose in Section 1I.4.(a) above.

1I.4.(c) The Grantee agrees to refund to A.I.D. upon request an amount equal to any United States funds used for the purposes prohibited by Section 1I.4.(a) above.

1I.4.(d) No funds provided by A.I.D. under this Grant shall be used to provide assistance, either directly or indirectly, to any country ineligible to receive assistance pursuant to the Foreign Assistance Act as amended, related appropriations acts, or other statutes and Executive Orders of the United States (also see the Standard Provision of this Grant entitled "Ineligible Countries").

1I.5. Compliance With Federal Guidelines and Regulatory Procedures Pertaining to Recombinant DNA

1I.5.(a) The Grantee shall implement any research activities under this Grant which involve recombinant DNA in accordance with:

1I.5.(a)(1) The National Institutes of Health Guidelines for Research Involving Recombinant DNA Molecules;

1I.5.(a)(2) Procedures issued by the U.S. Department of Agriculture (USDA), the Environmental Protection Agency (EPA), or other appropriate Federal agency;

1I.5.(a)(3) A.I.D.'s environmental procedures; and

1I.5.(a)(4) Such other Federal guidelines and procedures as may apply during the course of research.

1I.5.(b) The Grantee cannot commence testing in any foreign location until written approval for such testing is

obtained from the A.I.D. Project Officer and the government of the country where testing is planned. Testing shall be conducted in accordance with all applicable regulations of that country.

1I.5.(c) In addition, and prior to commencement of any such testing, the Grantee shall make a judgement and communicate same to the A.I.D. Project Officer as to whether the regulations, procedures, or facilities of the country in question are adequate to ensure testing in an environmentally sound manner. In the event such judgement is that they are not, the Grantee and the A.I.D. Project Officer will consult and agree on the conditions to be applied to the testing which will have such environmental effect.

1I.5.(d) Reports submitted to A.I.D. under this Grant will address regulatory issues as noted above related to the activity.

1I.7. Defense Base Act (DBA) Insurance and/or Medical Evacuation Services

Pursuant to Section J.16. of OMB Circular A-21 (for educational institutions) or Section 18 of Attachment B of OMB Circular A-122 (for nonprofit organizations other than educational institutions), the Grantee is authorized to purchase DBA insurance and/or medical evacuation services under this Grant. If DBA insurance and/or medical evacuation services are purchased, it may be purchased from the insurance company or agent with which A.I.D. has a contract to provide DBA insurance and/or medical evacuation services for A.I.D. contracts; provided that such insurance company or agent offers such DBA insurance/medical evacuation services at the same rates such insurance/services are provided under A.I.D. contracts. The Grant Officer will provide the name, address, and telephone number of such insurance company or agent upon request.

1I.9. Disposition of Property

With reference to Sections 1G.4. and 1I.2.(b) above, disposition of nonexpendable property acquired hereunder shall be as follows:

In Accordance with A.I.D. Instructions

1J. RESOLUTION OF CONFLICTS

Conflicts between any of the Attachments of this Grant shall be resolved by applying the following descending order of precedence:

Attachment 1 - Schedule
Attachment 3 - Standard Provisions
Attachment 2 - Program Description

1K. STANDARD PROVISIONS

The Standard Provisions set forth as Attachment 3 of this Grant consist of the following Standard Provisions denoted by an "X" which are attached hereto and made a part of this Grant:

1K.1. Mandatory Standard Provisions For U.S., Nongovernmental Grantees

(X) Allowable Costs (November 1985)
(X) Acccunting, Audit, and Records (August 1992)
(X) Refunds (September 1990)
(X) Revision of Grant Budget (November 1985)
(X) Termination and Suspension (August 1992)
(X) Disputes (August 1992)
(X) Ineligible Countries (May 1986)
(X) Debarment, Suspension, and Other Responsibility Matters (August 1992)
(X) Nondiscrimination (May 1986)
(X) U.S. Officials Not to Benefit (November 1985)
(X) Nonliability (November 1985)
(X) Amendment (November 1985)
(X) Notices (November 1985)
(X) Metric System of Measurement (August 1992)

1K.2. Additional Standard Provisions For U.S., Nongovernmental Grantees

(X) OMB Approval Under the Paperwork Reduction Act (August 1992)
(X) Payment - Letter of Credit (August 1992)
( ) Payment - Periodic Advance (January 1988)
( ) Payment - Cost Reimbursement (August 1992)
(X) Air Travel and Transportation (August 1992)
(X) Ocean Shipment of Goods (August 1992)
(X) Procurement of Goods and Services (June 1993)
(X) AID Eligibility Rules for Goods and Services (August 1992)
(X) Subagreements (August 1992)
(X) Local Cost Financing (June 1993)
(X) Patent Rights (August 1992)
(X) Publications (August 1992)
(X) Negotiated Indirect Cost Rates - Predetermined (August 1992)
(X) Negotiated Indirect Cost Rates - Provisional

(Nonprofits) (August 1992)
( ) Negotiated Indirect Cost Rates - Provisional (For-Profits) (August 1992)
(X) Regulations Governing Employees (August 1992)
( ) Participant Training (August 1992)
( ) Voluntary Population Planning (June 1993)
( ) Protection of the Individual as a Research Subject (August 1992)
( ) Care of Laboratory Animals (November 1985)
(X) Title To and Use of Property (Grantee Title) (November 1985)
( ) Title To and Care of Property (U.S. Government Title) (November 1985)
( ) Title To and Care of Property (Cooperating Country Title) (November 1985)
( ) Cost Sharing (Matching) (August 1992)
(X) Use of Pouch Facilities (August 1992)
(X) Conversion of United States Dollars to Local Currency (November 1985)
(X) Public Notices (August 1992)
(X) Rights in Data (August 1992)

1L. COST SHARING AND OTHER CONTRIBUTIONS

1L.1. The Grantee agrees to expend an amount not less than (a) the amount shown in the budget of this Grant for financing by the Recipient and/or others from non-federal funds (see Sections 1D. and/or 1H.), and (b) the amount shown in the budget of this Grant for financing by the Recipient and/or others from other federal funds.

1L.2. The Standard Provision of this Grant entitled "Cost Sharing (Matching)" makes reference to project costs. "Project Costs" are defined in Attachment E of OMB Circular A-110 as all allowable costs (as set forth in the applicable cost principles [see the Standard Provision of this Grant entitled "Allowable Costs"]) incurred by a Grantee and the value of in-kind contributions made by the Grantee or third parties in accomplishing the objectives of this Grant during the program period.

1L.3. The restrictions on the use of A.I.D. funds provided hereunder, as set forth in this Grant, do not apply to cost-sharing (matching) or other contributions unless such restrictions are stated in the applicable federal cost principles and/or imposed by the source of such cost-sharing (matching) funds or other contributions.

ATTACHMENT 2

PROGRAM DESCRIPTION

The Grantee's proposal entitled "The Effects of Project Food Aid On Agricultural Production and Nutrition in Semi-Arid Areas of Kenya: A Peasant Household-Firm Model Approach" and dated February, 1993 (Principal Investigator: Mesfin Bezuneh) is attached hereto as the Program Description (Attachment 2) and is made a part of this Grant.

AGENCY FOR INTERNATIONAL DEVELOPMENT
RESEARCH GRANTS PROGRAM
FOR
HISTORICALLY BLACK COLLEGES AND UNIVERSITIES

Submitted by

Clark Atlanta University
James P. Brawley Drive at Fair Street
Atlanta, GA 30314

THE EFFECTS OF PROJECT FOOD AID ON AGRICULTURAL PRODUCTION AND NUTRITION IN SEMI-ARID AREAS OF KENYA: A PEASANT HOUSEHOLD-FIRM MODEL APPROACH

{REVISED}

Principal Investigator: Mesfin Bezuneh

February, 1993

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Kofi Bota, Vice President
Research & Sponsored Programs

This proposal has neither been submitted to other funding agencies nor is it closely related to research being done by other sponsors.

THE EFFECTS OF PROJECT FOOD AID ON AGRICULTURAL PRODUCTION AND NUTRITION IN SEMI-ARID AREAS OF KENYA: A PEASANT HOUSEHOLD FIRM MODEL APPROACH

A Research Proposal

by
Mesfin Bezuneh
Associate Professor & Chair

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THE EFFECTS OF PROJECT FOOD AID ON AGRICULTURAL PRODUCTION AND NUTRITION IN SEMI-ARID AREAS OF KENYA: A PEASANT HOUSEHOLD-FIRM MODEL APPROACH

Mesfin Bezuneh*

ABSTRACT

The developmental role of food aid has been debated for many years. Some argued that food aid has a great potential of dampening both short-run and long-run price incentives to producers, and weakens incentives of the recipient government to develop an effective agricultural policy (Schultz, Mann). Others have argued that a successful food aid program could lead to human and physical capital formation in the recipient countries (Mellor, Deaton, Bezuneh). The specific question addressed is: Could food aid be a developmental tool? If food aid can contribute to employment, production, income and nutrition, then it may accelerate development and result in more equal patterns of income distribution. However, its effectiveness in promoting development clearly depends on the conditions under which it is disseminated and administered.

The purpose of this proposal is to empirically examine the impact of a particular type of food aid program, food-for-work (FFW), on key developmental indicators such as employment, production, income, and nutritional status in semi-arid regions of Kenya, Baringo District in particular.

The study will use a "wholistic" approach that integrates both the production and consumption effects of FFW. The results will have significant development and policy implications for both recipient and donor countries. Efficiency, sustainability and overall food security are major elements in the proposed study.

*** Associate Professor and Chairman, Department of Economics, Clark Atlanta University, Atlanta, Georgia.**

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THE EFFECTS OF PROJECT FOOD AID ON AGRICULTURAL PRODUCTION AND NUTRITION IN SEMI-ARID AREAS OF KENYA: A PEASANT HOUSEHOLD-FIRM MODEL APPROACH[1]

I. INTRODUCTION AND PROBLEM STATEMENT

The developmental role of food aid has been debated for many years. Some argued that food aid has potential disincentive effects on recipient governments and food producers (Schultz, 1960; Mann, 1967). Others have argued that a successful food aid program could lead to human and physical capital formation in the recipient countries (Mellor, 1980; Deaton, 1980; Bezuneh, 1985). The question is: Could food aid be a developmental tool? If food aid can contribute to employment, production, income and nutrition, then it may accelerate development and result in more equal patterns of income distribution. However, its effectiveness in promoting development clearly depends on the conditions under which it is disseminated and administered.

The purpose of this research is to analyze the effects of a particular type of project food aid program, food-for-work (FFW), on household agricultural production, consumption patterns and nutritional status in rural Kenya (Figure 1). In Kenya, in recent years (since 1980), all food aid is disseminated as project food aid.

The issue of food-aid induced disincentive to the recipient country's agriculture production system has been a serious policy concern for both recipient countries and donor organizations. Two basic arguments have dominated the disincentive literature:

1) That food aid has a great potential of dampening both short-run and long-run price incentives to producers;

2) That food aid in the long-run weakens incentives to develop an effective agricultural policy of a recipient government (Schultz, 1960; Nelson, 1981).

These price and policy disincentives (or distortions), in turn, could lead to economic inefficiency and misallocation of scarce resources.

In recent years, another concern is added to the disincentive issue of food aid when even food aid is disseminated to a well-defined segment of the population, such as the food-for-work program (FFW).

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[1] ***This proposal has been revised according to panel's and individual reviewers' comments. (See attached, "Response to Panel's Comments" and "Response to Individual Reviewer's Comments").***

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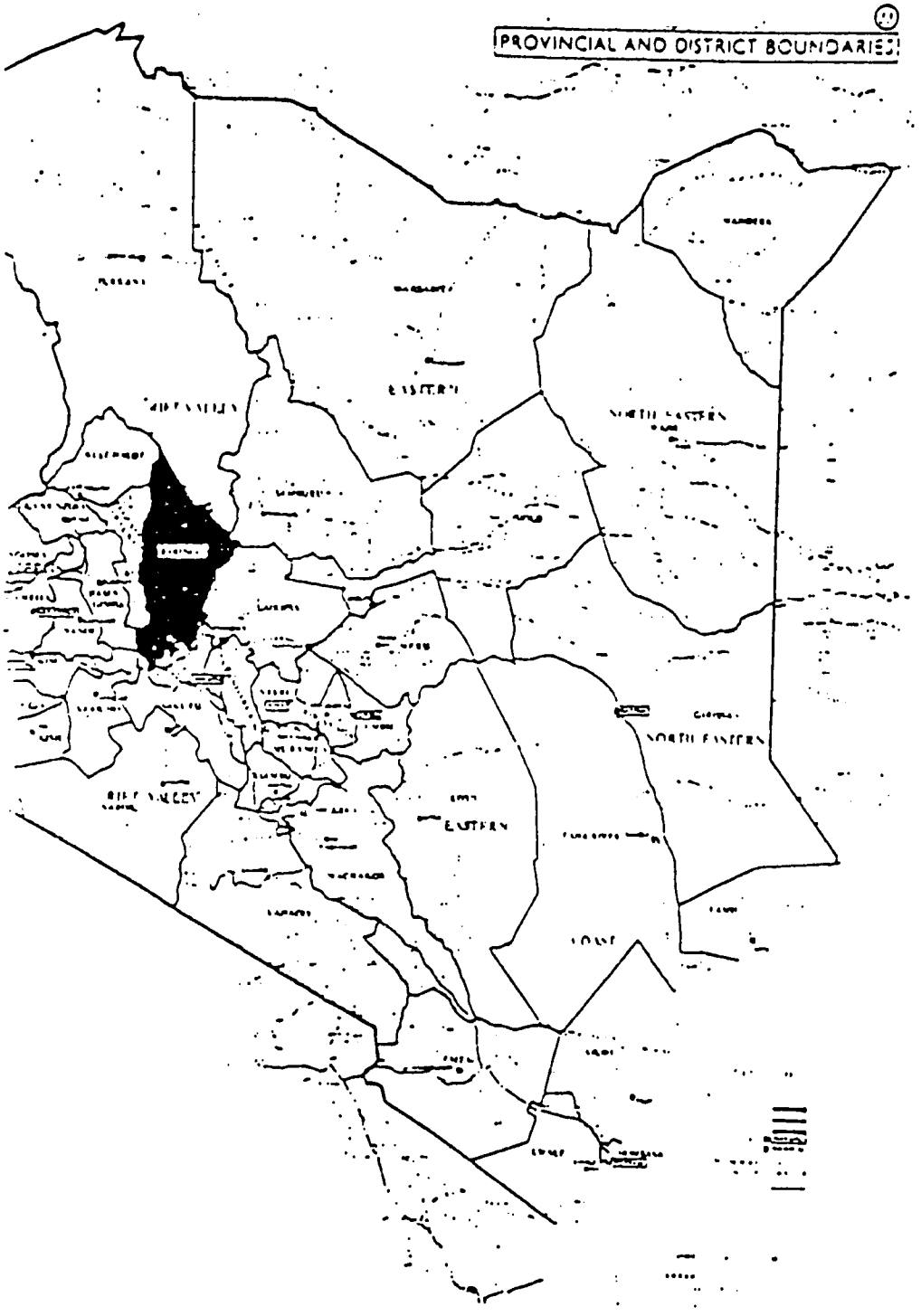
Figure 1. Map of Kenya and the Study Region



International food assistance programs through project food aid such as FFW are becoming the cornerstone of agricultural and economic development policies that affect low-income peasant households in arid and semi-arid policy effectiveness is whether nutritional gains and increased human and physical capital productivity is achieved at the community level. This is the specific aim of FFW programs which are designed to directly distribute food in exchange for labor.

FFW strategies were conceived as a means of achieving multiple objectives:

1) Meeting food needs of targeted low-income families;
2) Providing nutritional supplements for low-income families; and
3) Utilizing "surplus" labor to create physical public and private sector capital that improves agricultural and rural sector infrastructure development.

The underlying rationale is that the use of "free" labor resource would create additional productive capital capable of producing permanent income streams to the targeted community. Hence, ideally, such programs would increase employment opportunities, agricultural output, and create physical as well as human capital in both private and public sectors, and promote more equitable distribution of income (Maxwell, 1978; Maxwell and Singer, 1979; Schuh, 1979; Deaton, 1980; Deaton and Bezuneh, 1987), which in turn leads to a higher level of consumption and improved nutritional status of the target community. On the other hand, however, it is feared that the rural farm households who participate in reduction of locally produced food crops. In other words, FFW programs may have disincentive effects. This, of course, will lead to greater dependency.

II. OBJECTIVE OF THE STUDY

The effects of food aid, FFW in particular, must ultimately be determined by the responses of economic agents. For a large segment of the population in developing countries, these responses occur in the context of the farm-household where production and consumption decisions are made jointly. Participants in rural projects are being paid in food commodities in exchange for their labor input into soil and water conservation projects. Consequently, FFW expands the range of consumption, and the amount of nutrients available to participant households, while improving the productive capacity of the agricultural system.

The extent to which FFW programs have successfully achieved its long term objectives has yet to be documented. While it is clear that seasonal and short-term employment has been generated, neither the productivity benefits of the newly created capital nor the nutritional consequences of the distributed food have been well understood. Hence, the production and consumption decisions that underlie the nutritional and economic welfare of peasant households must be examined in light of FFW program.

In view of these interrelated forces, this research is designed to accomplish the following objectives:

1) To identify the range of expected impacts of FFW on farm households in Baringo District of Rift Valley Province, Kenya. Does FFW augment or displace development efforts? This requires:

   a) measuring the effects on household agricultural production and consumption patterns;

   b) measuring the resulting changes in nutrient availability stemming from these altered patterns; and

   c) measuring the effects on long-term physical and human investment as they relate to community and rural development strategies; and

2) To draw policy inferences from this analysis for both project food aid recipients, Kenya in particular, and food donor countries and agencies, such as the USA and World Food Programme of United Nations.

The overall hypothesis of the study is that the FFW program affects the dual role of the farm household as both producer and consumer through its impacts on physical and human capital; more specifically, on demand and supply of agricultural labor, production, income, consumption and, hence, nutrition.

III. BACKGROUND AND RELATED RESEARCH[2]

In almost all recipient countries, food aid affects both the supply and demand of food through market prices. Normally, food aid imports would be expected to reduce farmers' income and increase consumers' income through its depressing impact on domestic food prices. Hence, the traditional conflict between producers and consumers seems to be aggravated when food aid is integrated into general welfare concerns and increased output. In other words, non-subsistence producers often need higher prices to increase production while consumers, the poor in particular, require lower prices to raise and stabilize their living standards. However, previous analyses of food aid have been entirely focused on the disincentive effect of food aid on production. The consumption and/or income potential of food aid has been largely ignored in current literature.

Two basic arguments have been the dominant justification for the extensive research in the area of disincentives (Schultz, 1960; Isenman and Singer, 1977; Nelson, 1981): a) that food

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[2] *This is a new section added to the original proposal as requested (and as a response to comments made) by an anonymous reviewer.*

aid has a great potential of dampening both short-run and long-run price incentives to producers; and b) that food aid in the long-run weakens incentives to develop an effective agricultural policy of a recipient government. It is argued that these price and policy disincentives (or distortions) could lead to economic inefficiency and misallocation of scarce resources. Thus, several analyses of the food aid-price effects relationship have been undertaken (Mann, 1967; Seevers, 1968; Rogers and et al, 1972; Blandford and Von Plocki, 1977; Hall, 1980; Bezuneh and Deaton, 1981).

The results of these studies, however, do not provide a comprehensive guide to domestic food aid policy in recipient countries. This is because neither the specific role that food aid plays in consumption and income distribution nor the extent to which the possible disincentive affects both production and consumption simultaneously are explicitly addressed.

Sen and others have argued that the original Schultz's formulation of the disincentive issue, which was the starting point of food aid analysis of the last two decades, ignores the income creating potential of food aid. The increased food demand that grows out of derived income growth may offset in full, or at least in part, the impact of lower prices on domestic supply, depending upon the elasticity of demand (Sen, 1960, 1971; Dantwala, 1967; Bezuneh and Deaton, 1981).

In particular, if food aid is disseminated to the poor either through differentiated markets, such as "fair-price shops", at subsidized prices or other target programs (e.g., school children feeding, FFW), then some families will experience a net gain in real income since they now have relatively cheaper food than they would have had otherwise. Since the income effect of food aid is relatively greater for the low income families, i.e., because of their relatively higher income elasticity of demand for food, the gain in real income may result in an increase in food demand.

Although the existing food aid disincentive literature includes, by definition, both the demand and supply side of the recipients' food systems, the implications they draw are highly aggregative and only indicate either the net gain or loss of consumer welfare. For example, see Mann, 1967; Rogers, et al. 1972; Blandford and Von Plocki, 1977). But, the specific effects of food aid on domestic food price to the extent that they affect wages and/or employment, consumption, and the distribution of these consumption gains are the least studied part of the existing food aid-development literature. What is generally lacking in the literature, therefore, are studies which directly relate food aid to production and consumption behavior at the household level.

Any effort to improve the development process of Third World Countries must of necessity integrate production and consumption (or distribution) into the same policy basket. It is towards the combining of production, consumption, distribution, and employment goals into one developmental policy rather than to their separation, that food aid might have its greatest contribution to development strategies. However, the analytical tools used in understanding questions such as those mentioned above have been limited in scope especially with respect to the dynamic effects of food aid.

Until an appropriate analytical framework that incorporates concerns of production, consumption, employment, and distribution is developed, and until more detailed assessments of peasant household behavior can be made in an economic environment influenced by food aid imports, the developmental consequences of international food assistance will remain ambiguous.

This study will be directed toward the development of a Peasant Household Firm (PHF) model that incorporates both the production and consumption effects of FFW programs. This approach will provide a more adequate framework for exploring the dynamics of food aid in the development process of the recipient economy.

This study is concerned only with the role of FFW in the process of production and consumption behavior, and nutritional status of participant rural households in Kenya. The approach is based on a single agricultural production period (one year) and, therefore, does not represent a complete or exhaustive model that encompasses many issues previously discussed. A significant element in the development of this model is the hypothesis that FFW programs affect the dual role of the farm household as both producer and consumer through their impacts on demand and supply of agricultural labor, production, and consumption activities. This will have an important effect on income and nutritional status of the farm households.

IV. FFW AND THE STUDY AREA

The World Food Program (WFP) of the United Nations (UN), upon the Kenyan government's request, is involved in a number of rural development projects and famine relief services in most food-deficit areas of arid and semi-arid parts of the country (ASAL). All the WFP projects are supported by food aid mostly committed as FFW.

The FFW project in Baringo District started in 1981 season as "Baringo Soil and Water Conservation Project" with the following long-term objectives:

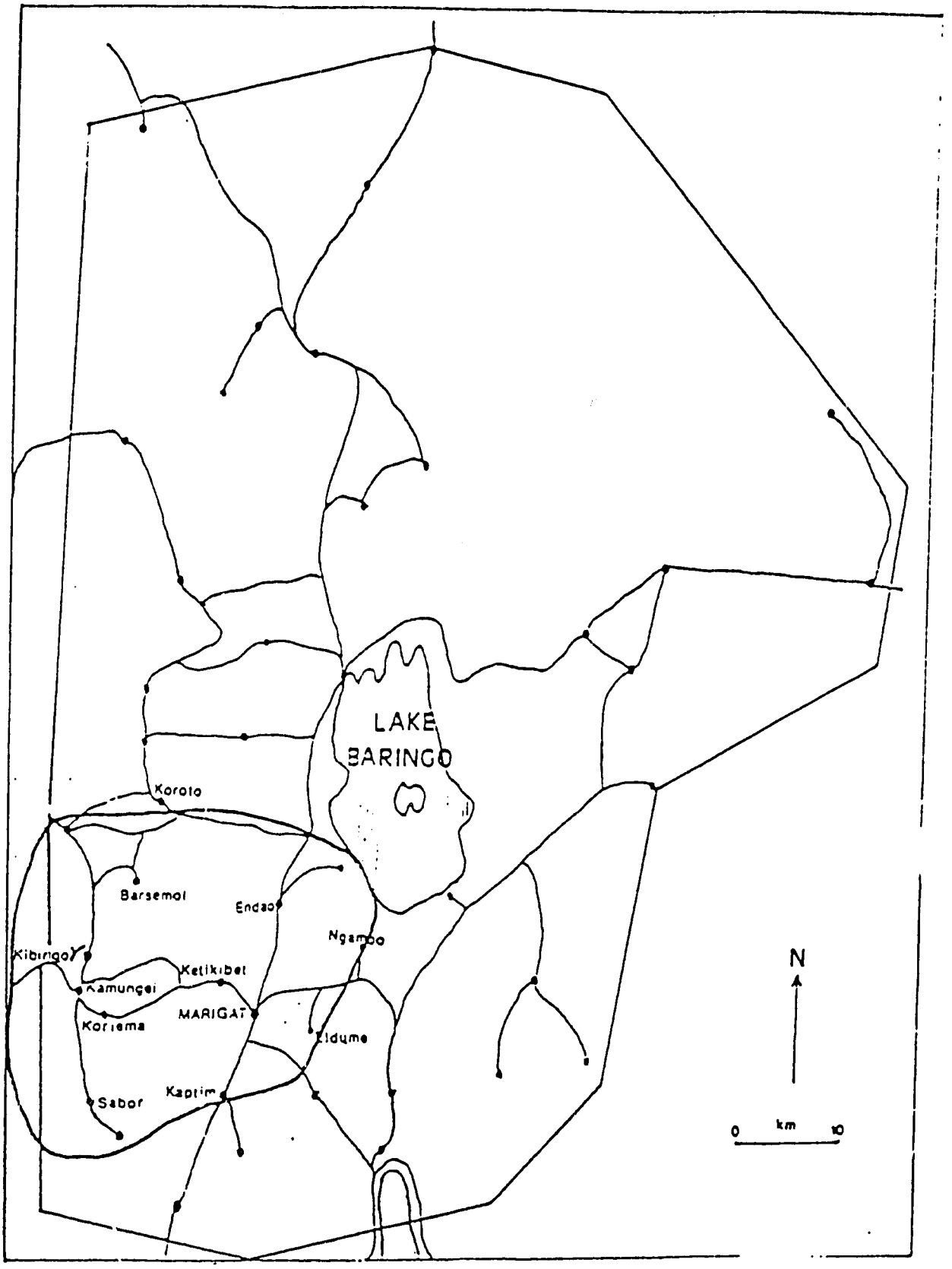
1) To generate more reliable, sustainable and, when possible, higher levels of crop and livestock production in ASAL areas;

2) To reduce the vulnerability of the poorer segments of ASAL society by better integrating them into the development process; and

3) In conjunction with productive interventions, to encourage soil and moisture conservation and the preservation of the resource base.

The project was designed to utilize 800 workers per month, by paying food (maize, beans, and oil) for labor on a range of conservation and production activities within the Baringo Semi-Arid Area Project (BSAAP) which covers the most arid part of the Baringo District over 40 percent of the District (Figure 2). The project region is one of the most food deficit area of the country.

Figure 2. Baringo Semi-Arid Project and the Study Area



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Food aid under FFW program contributes 43 percent of the total local production, and yet meets only 16 percent of the food deficit (WFP, 1988).

The specific research area is shown by a "circle" in Figure 2. It includes Marigat and Ngmyang Division, and constitutes about 85-90 percent of the FFW activities of the District. The sublocations of the research area include Koroto, Barsemoi, Endao, Koriama, Sabor, Katim, Eldume, Kimodis and Kabusa.

Since 1984, the FFW project has been expanded to utilize at least 1,500 workers per month, and food is the major input into these rural/community development activities (Table 1). The second five-year phase of the FFW/Baringo project is planned to begin in 1989/90 cropping season with approximately US $3.14 million worth of Food aid (using the 1988 constant prices) (WFP, 1988). At least 25 percent of the total food aid budget of WFP comes from Title II of U.S. Public Law 480.

V. RESEARCH METHODOLOGY AND PROCEDURES

A non-market or targeted approach such as FFW is hypothesized to affect both agricultural production and consumption decisions simultaneously. In order to measure these complex interrelated forces, a model that incorporates the dual decision behavior of the peasant (subsistence or traditional) household, the peasant household-firm (PHF) model, will be employed. The empirical application of this approach is traceable to Yotopoulos and Lau (1974), whose contribution has since been elaborated and extended by Barnum and Squire (1979), Ahn et al (1981), and Strauss (1982, 1984). None of these studies, however, has incorporated the impact of food aid such as FFW and the complex measurement issues associated with human and physical capital.

More specifically, the PHF model integrates production and consumption activities under a single framework. On the one hand, the farm household is viewed as a firm which attempts to maximize net return (or income) from own production subject to a given technology (or production function) and a set of resources. On the other hand, it is viewed as a consuming unit which maximizes utility from own consumption of agricultural output as well as the consumption of non-agricultural outputs, including leisure, subject to a given income (or budget) constraint. This framework is particularly appropriate to the analysis of food aid/FFW programs since these are exogenous shocks to the rural economy, and are expected to affect the decision criteria of the target farm household.

The farm household decisions will be modeled in a strictly block recursive manner (Yotopoulos and Lau, 1974; Strauss, 1982, 1984). This implies that farm household first make production decisions according to a set of goals (e.g., meeting subsistence requirements, profit maximization), and then given these goals determine the optimal level of consumption of goods as well as leisure that maximizes utility. This assumption may not hold if farm households are actually equating production with own subsistence consumption, and the goal is only meeting

Table 1. FFW Activities in Baringo District, Kenya (1988)

	Indicator	Key Variable
1)	Soil and Water Conservation	
	a. Water harvesting	Area; numbers of farmers adopting, type of layout and costs; crops grown; yields.
	b. Terracing (Ganya Juu etc.)	Area served; number of farmers adopting, crops grown; yields.
	c. Gully stabilization (Check dams)	Design; durability and effectiveness.
2)	Range Improvement	Seed/seedlings issued; area rehabilitated; number of fodder plots and yield; number of farmers adopting.
3)	Forestry Development Nursery and Tree Planting	Area; number of farm lands and tree planted for fuel wood as well as for non-fuel wood.
4)	Small-scale Irrigation	Service area; number of irrigators; cropping intensity; yields.
5)	Water Pans	Capacity; rate of fill; utilization; catchment protection.
6)	Livestock Breed Improvement	Numbers and type; survival rate; linkage to individual/group cooperation in range improvement and water pan development.
7)	Dips	Area served; utilization.
8)	Extension	Number of active extension staff; group/village meetings held; adoption and effect of recommended practices.
9)	Research	Station, on-farm trials established; trial results; recommendations given to extension; quantity improved seed bulked and distributed.
10)	Training	Number of man-days training; number of training courses held; number of staff trained.

Source: Adopted from WFP, 1988.

own consumption needs. This, of course, would require the model of the farm households to be specified simultaneously. However, farm households in the study area have motives above and beyond meeting own consumptions. Hence, the equality argument between production and consumption does not hold.

Following Bezuneh, Deaton and Norton (1988), a multi-crop model that integrates FFW into the basic PHF model will be specified as:

$$U = U(C_i, M_i, G_i, L) \tag{1}$$

$$F_i = F_i(D, A, K, I^k_{i-1}) \tag{2}$$

$$T = V + D + J + L \tag{3}$$

$$q_iM_i = W(V) + Y + P_i(F_i + G_i - C_i) - W_kd_k \tag{4}$$[3]

where the participant household's utility functions (U) are assumed to be a function of own consumption of agricultural outputs (C_i), consumption of various market goods (M_i), consumption of food from FFW programs (G_i), and consumption of leisure (L). Agricultural goods (F_i) are produced using conventional inputs of labor (D), land (A), capital (K), and capital (fixed and variable) generated from FFW projects lagged by a single production cycle, i.e., one year (I^k_{i-1}). The vector of total time endowments (T) of a participant household is assumed to be allocated to wage labor (V), own farm labor (D), FFW labor (J), and leisure (L).

Finally, a participant household faces a budget constraint which equates total cost in production and consumption to total or full income from selling labor and farm products (when there is excess of own consumption) and income from other sources (Y). The variables in (4) are prices of market goods (q_i), prices received from farm output and FFW when sold, or prices paid when purchased (P_i), prices of labor when sold for wage (W) and (W_G) when households participate in FFW projects or implicit wage rate, prices of variable inputs (W_k), and variable inputs (d^k). The main thrust of this approach is that FFW participant farm households maximize (1) subject to (2), (3) and (4).

In this study, we will also model landless households since it has been argued that the FFW program might be relatively more attractive to the landless than to the landed households. It is quite possible that a portion of participant households may be landless, and hence may not produce their own crops. In this case, total consumption must be purchased and total household labor must be sold. Therefore, the effects of FFW on the landless participants can be determined by standard consumer demand theory, since landless households are solely consumers and are not

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[3] *The specification in (4) evaluates the food received under FFW at the existing market price. Alternatively, food received could be evaluated at the existing wage rate, and the appropriate specification would be:* $q_iM_i = W(V) + Y + P_i(F_i - C_i) + W_GJ - W_kd_k$.

affected directly by the production argument. Formally, the landless participant households will maximize a utility function of the form:

$$U_i(L, C_i, M_i, G_i) \quad (5)$$

Subject to: $T = V + J + L$ (6)

and, $q_i M_i = W(V) + Y + P_i(G_i - C_i)$ (7)

where all variables are as defined earlier.

A. Production Estimates

First, the production segment of the FFW participant households' model will be estimated using a multi-year linear programming (MLP) specification (Ahn et al., 1981; Bezuneh, Deaton and Norton, 1988). The L.P. model will determine the farm household activities with and without FFW that maximize net income subject to available resources and minimum subsistence requirements. The net returns will, then, be integrated into the consumption segment of the model. This approach will allow us to determine the impacts of FFW on own production and to establish shadow prices for labor and other inputs derived from FFW activities. This model will include risk measures so that variability in yield (due to, for example, weather) could be taken into consideration. Thus, this research will attempt to analyze and draw some implications about the potential of FFW as a risk reducing factor in Agricultural production.

B. Consumption Estimates

The consumption segment of the farm household will be specified econometrically to conform to the Almost Ideal Demand System (AIDS) of Deaton and Muellbauer (1980). The estimated AIDS system will provide price and income elasticities. This will explicitly enable us to measure the impacts of FFW interventions on own consumption of various crops, consumption of market goods, and the household supply of labor and other inputs to different activities. The effect of income changes resulting from the production effects of FFW will be integrated into and examined in the consumption model.

Program impact on nutritional availability to the household unit can, then, be determined in part by estimating caloric and protein contribution of food consumed given household consumption and production decisions in light of FFW interventions in the existing farming systems of Baringo District.

C. Nutrient Estimates:

Assessing the impacts of FFW on human capital formation depends on understanding the specific nutritional contributions of FFW to the overall diet of FFW participant households. Given the argument of nutritional effectiveness of food aid programs (for example, Deaton, 1980; Mellor, 1980) the final step of the proposed study is to directly address the impact of food aid on nutritional intake of participant households.

The major hypothesis here is that the nutritional gains obtained from food-payment under FFW are higher than the net market food value equivalent (income gains). This hypothesis stems from an intuitive notion that food commodities in hand lead to higher food consumption, partly due to the transaction costs associated with converting food aid commodities into cash. Hence, it is expected that FFW differentiates the consumption behavior of the participants, compared to non-participants, and that this effect can be measured by the respective income elasticities of demand for nutrients.

The method will be a two-step procedure. First, a set of Mathematical Linear Programming Models (Lancaster type) will be used to estimate the marginal (shadow) nutrient prices of four consumed nutrients (calories, protein, fat and carbohydrates). The second step, i.e., after estimating the optimal nutrient shadow prices through the LP model, is to specify an econometric model for nutrient demand; thereby estimating the own and cross-price elasticities, and income elasticities of demand for the four nutrients. The advantages of such procedure is elaborately discussed in Lancaster, 1971, and Ladd and Suvannnunt, 1976.

VI. DATA REQUIREMENTS

A basic data set has been compiled that will provide the starting point for this research. Under the sponsorship of the National Science Foundation (NSF) and the College of Agriculture and Life Science, Virginia Polytechnic Institute and State University (VPI & SU), survey data were collected in 1983 to assess the initial effects of FFW. By 1983, the FFW program in Baringo District/Kenya has been in operation only for two years. This survey data and the initial impact analysis from this data will complement the proposed study and will be the basis for comparative analysis of short-term (immediate) and long-term (cumulative) effects of food aid/FFW program. In addition, the proposed research will allow us to improve and expand the data base so that we will be able to validate the PHF/LP Models and conclusions of the previous study. This in turn might present a general framework for future research in other countries/ regions.[4]

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[4] *This point was called to our attention by an anonymous reviewer*

Since the objective of this study is to disaggregate the impacts of food aid/FFW at the farm household level, it is necessary to concentrate on analysis of micro-data relating to both consumption and production activities of the households. Thus, our unit of analysis will be the household, both FFW participants and non-participants (i.e., without FFW).

The empirical application of the proposed PHF model requires a detailed data on household's production/input-output, labor use, expenditure/consumption patterns, income and household composition for at least a single cropping season. This study will carry out on-farm household survey in the FFW project area of Baringo District/Kenya (Figure 2) as to reflect the following key variables to our analysis:

1) Labor profile - Annual labor allocation by activities.

   Example: Own-farming, livestock, wage employment, FFW and non-income generating activities.

2) Production - Annual production by crops and livestock.

   Example: Maize, millet, sorghum.

3) Consumption - Annual consumption of all food items by source.

   Example: Own production, purchase, FFW.

4) Income - Annual income from all sources.

   Example: Sale of grain of livestock, wage employment, FFW, and others.

5) Expenditure - Annual total expenditure on all food and non-food items.

   Example: Veterinary service, clothing and food items.

6) Budget Data - Annual input/output data by activities.

   Example: Input requirements for a specific crop or livestock and the source of the inputs (own purchase and FFW).

7) FFW - Annual allocation of FFW by activities.

   Example: FFW for soil and water conservation, small-scale irrigation, forestry, etc.

The study period will cover one calendar year, February 1994 through January 1985. The reason for this is to follow strictly the production cycle of the study area which begins in February with land preparation.

In order to obtain a sample of households for this study, first a comprehensive census of households for the defined study locations will be taken by using the selected local enumerators. Then, a representative sample of at least 300 households will be obtained using a single random sampling procedure consistent with Krejcie and Morgan's formula (Krejcie and Morgan, 1970).

Sampled households will be interviewed at least once to obtain the necessary information concerning household's characteristics; asset ownership such as land, livestock, and other fixed capital. Households will be visited weekly during the study period to generate annual household consumption/expenditure data.

The critical period for production data is the period between land preparation and harvesting inclusively (Smith, et al., 1982). For the current study, this is February through August. During this period, households will be asked to provide approximate average information on inputs by crops, harvests received, disposal (or use) of harvests, and labor use by activity.

We are aware that quantifying data such as yield per acre (or total harvest), own consumption, amount sold, and labor use is very difficult in semi-substance economy. An extra effort will be made in filling data gap (questionable data) through frequent field and home observation (visits) and by reducing the recall period. And, of course, one need to be extra cautious about frequent visits of households due to the time required that heads of households must take away from other activities (as was pointed out by an anonymous reviewer).[5]

VII. STEPS FOR THE ENUMERATION PROCESS[6]

Phase 1 - At Clark Atlanta:

Questionnaire for eliciting the necessary data will be designed using secondary information.

Phase 2 - At Egerton University (with collaborative individuals):

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[5] *The last half of this section was added as requested (and as a response to comments made) by an anonymous reviewer.*

[6] *This is a new section added to the original proposal as requested (and as a response to comments made) by an anonymous reviewer.*

The questionnaire will be revised to reflect the conditions of the selected study area. Here information from WFP, BPSAAP and Egerton University (especially Departments of Agricultural Economics, Animal Science, Home Economics and Range) will be utilized.

Phase 3 - At the Study Site:

With the collaborations from Egerton University, the local chiefs and assistant chiefs of the study area local enumerators will be selected for training. The training is planned to be conducted in five stages:

First, the overall objectives of the research and the specific research problem being addressed will be discussed elaborately. Then, the question of how the community benefits from such research and how the results could be disseminated to local policy makers will be outlined. This stage will be very crucial since local leaders (e.g., chiefs) and other supportive individuals (e.g., technical assistants from the Ministry of Agriculture) will take part.

Second, the questionnaire will be reviewed with the enumerators in its entirety (i.e., question by question). The emphasis here will be to clarify the intent of each question. This will be very important since the questionnaire will be written in English and the interview will be conducted in "Kalenjin," the local dialect.

Third, the enumerators will be asked to pair and interview each other. The results of this interview will be reviewed and further clarifications will be provided. At the end of this stage, about 10 able enumerators will be selected based on their ability as reflected in the trial enumeration process.

Fourth, these enumerators will be sent to interview farm households for the purpose of pre-testing. The final questionnaire will then be prepared in light of the pre-testing interviews.

Finally, individual or a group of enumerators will be assigned a specific sublocation to take a complete census of the study area.

During this process, guidelines and procedures by which individual enumerator's work would be evaluated and rewarded will be established.

VIII. RESEARCH IMPLEMENTATION PLAN

Table 2 depicts the activities and the period of execution:

1) The study will be completed in about 27 months;

Table 2. Research Implementation Plan
June 1993 – September 1995

Activity	June	July	August	September	October	November	December	January	February	March	April	May
I. Development of Survey Instrument*												
• Visit study area												
• Pre-testing												
• Training												
• Meeting other Requirements (1993)												
II. Survey Begins: (1994)												
A. Production Activity (Input/Output):												
Land prep.												
Planting												
Weeding												
Harvesting												
Livestock Activity												
FFW Activity												
B. Consumption/Exp. Activity** (Food and Non-food)												
III. C. In country Data analysis *** (1995)												
Preliminary Report Writing/Presentation												
D. Economic Analysis and Final Report Writing (1995)												
E. Submission of Final Report (1995)												

* In-country collaborating individuals will be making institutional and field arrangements.
** Sample households will be visited weekly for 12 months to generate annual household consumption/expenditure data.
*** These activities are required by the Government of Kenya prior to departure from Kenya with data.

2) The survey period will cover one calendar year (February 1994 - January 1995);

3) The survey instrument will be developed at Clark Atlanta University, and will be pre-tested in the study area with in-country collaborators;

4) A representative sample of at least 300 households (FFW participants and non-participants) will be obtained using a single random sampling procedures;

5) Enumerators (10-15) will be trained and stationed in sublocations as shown in Figure 2;

6) Preliminary data analysis and report writing will be carried out in Kenya with the in-country collaborators;

7) Preliminary results will be presented to all relevant and concerned government, parastatal, and in-country international institutions. Recently, this has become a standard requirement by the government of Kenya;

8) Detail Economic analysis and final report writing will be carried at Clark Atlanta University.

Given the present price, foreign exchange rate, transportation and labor cost, the proposed study will require about $112,151, as shown in the Budget Table.

X. INSTITUTIONAL COLLABORATION AND SUPPORT

A collaborative research effort has been established between the Department of Agricultural Economics at Egerton University and the Department of Economics at Clark Atlanta University.[7] As part of this collaboration, Mr. Edwin K. Ireri who is a lecturer (equivalent to Assistant Professor) and Professor Isaac Rop, Chair of the Department of Agricultural Economics at Egerton University will collaborate on the proposed research (see vita and letter of March 4, 1993 and August 18, 1989). These individuals and the principal investigator, Bezuneh, were colleague when Bezuneh was a research and teaching fellow at Egerton University in 1983-84 and carried out farm-household survey, funded by the National Science Foundation and VPI and SU, in Baringo District. The 1983-84 household survey on which the proposed research will build was based on the successful linkage developed with Egerton University and World Food Programme (WFP/Nairobi) of the United Nations (UN).

In 1988, the principal investigator (PI) was a member of UN/WFP mission which reviewed two FFW projects in Kenya. In August 7-23, 1989, he visited Egerton University and WFP/Nairobi and the study site with the WFP program officer, FFW field coordinators and implementing officers, and Egerton University faculty member (See, for example, letters of August 18, 1989 by Mr. Yegan and Mr. Ireri). The first draft of this proposal was discussed with these individuals during this visit, and their views, suggestions and comments are reflected in what is being proposed. More recently (October 17-24, 1992) the PI visited Kenya (and Egerton University), and the status and the relevance of this proposal was discussed. The overall in-country collaboration, as discussed with the PI, in implementing the proposed research is schematically presented in Figure 3. As shown, Egerton University will play a pivotal role in this research (the Department of Agricultural Economics, and Home Economics in particular).

Professor Brady J. Deaton (from the University of Missouri), who has done extensive work in food aid analysis and was one of the principal investigators of the earlier (first phase) work on FFW in Kenya, will be a consultant for this study (see vita).

These collaborations and linkages at both the institutional and field level, we feel sure, will strengthen the research effort and take the necessary steps to overcome institutional and/or field barriers in the process of field data collection.

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[7] Institutional Characteristics and International Capabilities are briefly discussed in the Appendix.

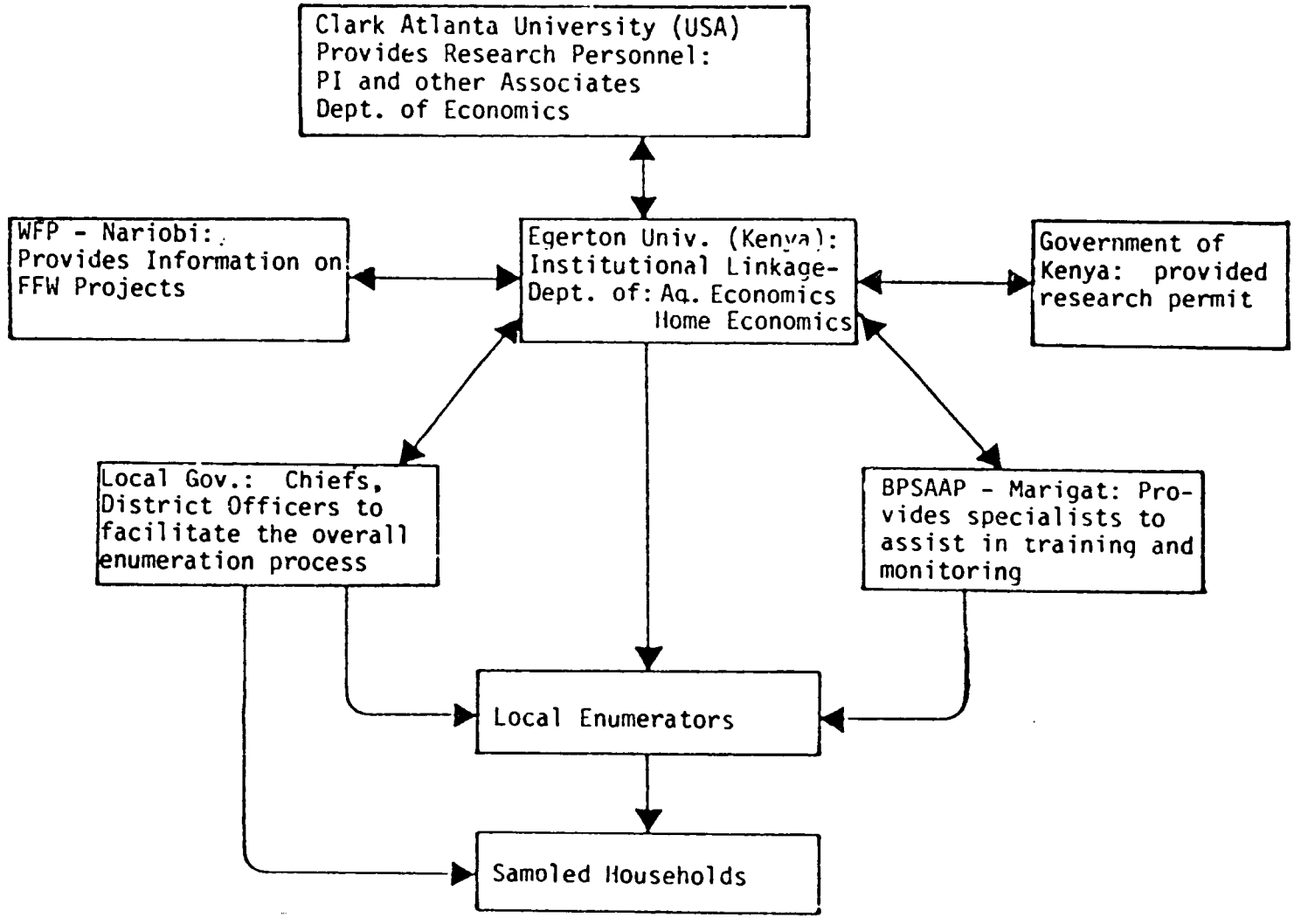

Figure 3. Schematic Representation of In-country Collaboration.

XI. RESEARCH RELEVANCE TO AID

The contribution of this study will be in two areas:

1) It will answer a number of questions that have been raised concerning FFW and its developmental implications, and

2) It delineates a "wholistic" micro level approach for examining impacts of any project food aid, and FFW in particular.

In various USAID supported food aid conferences and seminars (e.g., AID/Peace Corps Food Aid and Natural Resources Workshop, May 25-29, 1987) and in other professional meetings (e.g., American Agricultural Economics, August 1992, Baltimore, MD) many concerns about the disincentive and efficacy of FFW were raised. These include:

1) Does FFW augment or displace own food production, and how does it affect dependency?

2) How does it affect total income, household consumption and hence nutrition?

3) Does it facilitate the on-going process of inequitable size distribution of income (or growth)? and,

4) What are the implications of FFW activities for sustainability and food security?

5) How does it affect the overall long-term rural/community development strategies?

This study will attempt to provide an assessment of these and other related concerns about FFW.

The results of the proposed research will have an important policy implication that should strengthen both the donor (U.S.) and the recipient (Kenya) food policies. More specifically, the information will be useful to USAID, Food for Peace Office in particular, for designing future programs and implementing strategies to improve the developmental role of project food aid. In addition, the methodology developed in this study can be a guideline for a microeconomic impact analysis of all food aided projects of USAID.

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