PN-31868

698-0407/15

PD-AAN-332

UNCLASSIFIED
CLASSIFICATION

PROJECT EVALUATION SUMMARY (PES) — PART I

Report Symbol U-447

1. PROJECT TITLE	2. PROJECT NUMBER	3. MISSION/AID/W OFFICE
Improved Rural Technology .05 Handmade Paper .11 Traditional Pottery .21 Photovoltaic Energy .22 Seaweed Farming .32 Ruvuma Fish Farming	698-0407	USAID/Tanzania

4. EVALUATION NUMBER (Enter the number maintained by the reporting unit e.g., Country or AID/W Administrative Code, Fiscal Year, Serial No. beginning with No. 1 each FY) 83-5

☒ REGULAR EVALUATION ☐ SPECIAL EVALUATION

5. KEY PROJECT IMPLEMENTATION DATES			6. ESTIMATED PROJECT FUNDING	7. PERIOD COVERED BY EVALUATION
A. First PRO-AG or Equivalent FY 80	B. Final Obligation Expected FY 82	C. Final Input Delivery FY 83	A. Total $ 499,425 B. U.S. $ 282,000	From (month/yr.) November, 1980 To (month/yr.) April, 1983 Date of Evaluation Review May 2, 1983

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

A. List decisions and/or unresolved issues; cite those items needing further study. (NOTE: Mission decisions which anticipate AID/W or regional office action should specify type of document, e.g., airgram, SPAR, PIO, which will present detailed request.)	B. NAME OF OFFICER RESPONSIBLE FOR ACTION	C. DATE ACTION TO BE COMPLETED
1. Handmade Paper 698-0407.05 - Proposer, Sister Jean Pruit should certify that AID funds provided under activity were used exclusively for the project in accordance with the scope of the project agreement.	Project Officer	June, 1983
2. Traditional Pottery 698-0407.11 - In promoting ceramics production for pottery makers a source of fuel for the kiln must be a major consideration before replication.	Project Proposer	Ongoing
3. Seaweed Farming 698-0407.21 - The University of DSM should specify how the exportation of seaweed crops from the mainland will be handled and spell out all project modifications in the final report.	Project Proposer	September 1983
4. Photovoltaic Energy 698-0407.22 A) Return of unused project funds totalling $22,362.34 should be accomplished B) recovery of levies paid on airline tickets issued for two project technicians, disallowed by USAID, should be pursued.	Project Officer	June 1983
5. Ruvuma Fish Farming 698-0407.32 - Plan is needed to transfer the responsibility for project implementation and technology transfer to the respective GOT entity. Peace Corps Project Managers' roles should be restricted to that of advisors providing guidance to designated GOT counterpart parts in fish pond construction, and transfer of this technology should be the responsibility of district and regional fisheries extension officers, in order to ensure a continuance when Peace Corps and AID's technical support ends.	U.S. Peace Corps.	September 1983

9. INVENTORY OF DOCUMENTS TO BE REVISED PER ABOVE DECISIONS

☐ Project Paper ☐ Implementation Plan e.g., CPI Network ☐ Other (Specify)
☐ Financial Plan ☐ PIO/T
☐ Logical Framework ☐ PIO/C ☐ Other (Specify)
☐ Project Agreement ☐ PIO/P
☒ None

10. ALTERNATIVE DECISIONS ON FUTURE OF PROJECT

A. ☒ Continue Project Without Change
B. ☐ Change Project Design and/or ☐ Change Implementation Plan
C. ☐ Discontinue Project

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

Joan Johnson, AFR/EA/TIOS

James Van Den Bos, Mission Evaluation Officer
USAID/Tanzania

12. Mission/AID/W Office Director Approval

Signature

Typed Name Arthur M. Handly,

Date May 9, 1983

AID 1330-18 (3-78)

6) Recommend that AID/W continue to fund small-scale IRT type activities through a follow-on project or other project mechanisms.

7) On IRT type small-scale projects, an orientation should be done by the designated project contractor as well as the Mission on AID USG regulations, waiver requirements and the significance of PACDs.

8) When possible priority consideration should be given to activities utilizing locally fabricated equipment and commodities in order to maximize the spin-off benefits to the local economy.

9) Backstopping of IRT type activities by USAID Project Managers should be strengthened and communication links should ensure monitoring to identify project problems and bottlenecks through bimonthly or quarterly status reports.

10) USAID/T should ensure that such IRT activities foster technology transfer and institutional building through identification of GOT entity and staff to carry on activity beyond PACD.

EVALUATION OF IMPROVED RURAL TECHNOLOGY PROJECTS IN TANZANIA

698-0407.05 HANDMADE PAPER

698-0407.11 TRADITIONAL POTTERY

698-0407.21 PHOTOVOLTAIC ENERGY

698-0407.22 SEAWEED FARMING

698-0407.32 RUVUMA FISH FARMING

TANZANIA

Evaluation Report

I. IRT Introduction

The evaluation covered five (5) separate activities funded under the African Regional Improved Rural Technology project (698-0407). These activities were authorized over a thirty (30) month period (from 11/3/80 to 4/23/82) all with different PACDs and LOPs. The activities funded covered handmade paper production, traditional pottery, seaweed farming cultivation, energy-related photovoltaic installation, and small-scale fisheries farming. They are listed below by activitiy, PACD and authorized AID funding:

IRT Project No.	Activity	Project Agreement	PACD	AID Total Fundin
698-04-7.05	Handmade Paper	11/3/80	12/31/31	$ 48,800
698-0407.11	Traditional Pottery	9/29/80	3/31/82	58,000
698-0407.21	Seaweed Farming	5/29/81	6/30/83	87,000
698-0407.22	Photovoltaic Energy	5/29/81	8/31/82	32,000
698-0407.32	Ruvuma Fish Farming	4/23/82	9/30/83	57,000
	Total AID Funding			$282,000

At the time of the evaluation, the handmade paper and pottery activities had been completed. The photovoltaic activity was terminated without reaching the implementation stage at expiration of the PACD. The seaweed farming activity required a six-month extension in PACD owing to an unforeseen delay in the training component. It is anticipated that the fish farming activity will be completed as noted in the table above.

The IRT project paper lists as criteria for approval those activities - small-scale in nature - which directly benefit the rural poor.

CDSS

The objectives listed by the Agency as the four key priorities are being met with respect to (1) private enterprise encouragement, (2) transfer of technology, (3) institution building, and (4) training. The activities funded under IRT which meet the above four criteria are enumerated below:

1. Handmade paper - technology transfer, institution building, private enterprise, and training.

2. Traditional Pottery - technology transfer, institution building, private enterprise, and training.

3. Seaweed Farming - technology transfer, institution building, private enterprise, and training.

4. Photovoltaic - limited technology transfer.

5. Ruvuma Fish Farming - training potential technology transfer, institution building, and private enterprise.

II. Evaluation Methodology

The IRT Africa Bureau project paper calls for an annual evaluation of authorized projects as per the PP authorized March 23, 1979. The five Tanzanian activities funded under the IRT each had a LOP of 12 to 18 months. USAID/Tanzania decided to conduct a comprehensive evaluation as the last authorized activity neared completion.

The evaluation of IRT activities was conducted by 1) J. Van Den Bos, Assistant Program Officer/Project Manager, USAID/Tanzania, and 2) Joan Johnson, AFR/EA/Tanzania Desk, AID/Washington.

The evaluation took three weeks, during which time the team visited the following locations:

April 14	-	Kigombe Village, Tanga region
April 15-16	-	Arusha and Singisi, Arusha region
April 18	-	University of Dar es Salaam
		U.S. Peace Corps Office, Dar es Salaam
April 19	-	Handmade Paper Mill, Dar es Salaam
	-	Nyumba ya Sanaa (present and future sites)
April 20-22	-	Songea, Ruvuma Region

CONTACTS MADE DURING IRT EVALUATION

Name	Title and Organization
1. Handmade Paper (698-0408.05)	
- Sister Jean Pruitt	- Director Nyumba ya Sanaa (House of Art) Dar es Salaam
2. Improvement of Traditional Pottery (698-0407.11)	
- Ali Sheriff	- Director, Arusha Pottery Works
Director	- Singisi Pottery Workshop Singisi, Tanzania
3. Seaweed Farming (698-0407-21)	
- Dr. Keto Mshigeni	- Project Manager and Chief Botanist Department of Botany University of Dar es Salaam
Mr. Hemed Ali Bohero	- Seaweed Farm Manager Kigombe, Tanga
4. Photovoltaic Energy (698-0407.22)	
- Mr. J. Mukolera	- Acting Head Electrical Engineering Dept. University of Dar es Salaam
- Mr. Peter Materu	- Former Project Manager Electrical Engineering Department University of Dar es Salaam
- Mr. Mvungi	- Former Project Technical Cooordinator Electrical Engineering Department University of Dar es Salaam

5. Ruyuma Fish Farming
(692-0407.32)

- Jim Dawson	- Director Peace Corps, Tanzania
- Mel Adams	- Associate Director for Rural Development Peace Corps, Tanzania
- Harold (Stu) Upton	- Project Proposer and Project Manager Mbinga District, Ruvuma Region
- Lucy Dixon	- PVC Project Manager Songea District, Ruvuma Region
- Dan Ehrenberg	- PVC Project Manager Tunduru District, Ruvuma Region
- Mr. Rimisho	- Regional Development Director, Ruvuma Region
- Mr. Lugazo	- District Natural Resources Officer, Songea
- Mr. J. Mwainyekuole	- District Fisheries Extension Officer Songea
- Mr. Chiwanga	- Fisheries Extension Officer
- Dean	- Health Training Institute Songea (MOH)

Tanzania's Small Industrial Development Organization (SIDO).

Two IRT activities, Improvement of Traditional Pottery and Handmade Paper were endorsed by local SIDO offices.

At the beginning of the evaluation, the team had planned to meet with SIDO representatives in Arusha and Dar es Salaam to discuss these two activities. However, time constraints and the inability to identify knowledgeable SIDO contacts, forced a change in plans. At the end of the evaluation, the team concluded that SIDO assistance to the two activities had been minimal after their initial endorsement. Therefore, little information would have been gained from discussions with SIDO officials.

HANDMADE PAPER (698-0407.05)

I. **Project Purpose:**

This activity proposed to establish a paper making mill which would manufacture and test handmade paper by combining modern and traditional method.

II. **Evaluative Comments:**

The evaluation team found the project to be entirely successful in providing appropriate technology to Tanzania to produce card stock, stationery and drawing paper. It has also succeeded in improving an existing technology. Prior to the project, there was no such organized production of these items in Tanzania. Further, the project introduced a vocational training skill in hand-made paper to the young participants and has resulted in the generation of employment opportunities. It has essentially advanced handmade paper technology to the mass production concept and a market exists which should ensure its institutionalization in Tanzania. The handmade paper mill project at Nyumba ya Sanaa (House of Art) was begun in September 1979. Since then it has grown from a staff of three persons to include up to seventy individuals, all primary school leavers. At least thirty percent of the group are handicapped. At the time of evaluation, the activity was being completely managed by Tanzanians, all trained under the project. The project is self-sustaining and replaces the need for imported paper products.

The project funds were originally required to procure three pieces of equipment: a hollander beater, a hydraulic press and a colandering machine, origin: Netherlands and England. The remainder of the money was to be spent on travel and consultancies. Due to slowness in providing project funds, the proposer ordered the machinery prior to AID/Washington approval of the project activity and was unaware that waivers would be required for the procurement or that project funding would then be after-the-fact.

In an effort to provide credibility to the projects according to AID definition, the USAID project manager construed a new project budget which did not include the project equipment as part of AID's contribution. In actual fact, however, total funding for the project was combined to purchase the originally planned equipment and other project components.

The project files indicate USAID was very reluctant to grant funds directly to Nyumba ya Sanaa without some other entity accepting responsibility for project oversight. USAID/T attempted to get the Maryknoll Sisters (the Order to which Sister Pruitt belongs) to administer the grant but this failed, because of fear that AID might later insist on auditing their records. The use of the Tanzania Rural Development Bank to act as intermediary was also proposed and dropped. The funding was eventually provided in check form to Sister Pruitt. This insistence of an intermediary delayed the project start-up.

Consultant services to the project were of strategic importance to the activity's success. The cost of the consultancies comprised approximately 50% of the original AID grant. The grantee felt extremely shortchanged due to the extreme brevity of the two consultancies. The consultants were eminently qualified in the art of handmade paper but did not stay in Dar es Salaam long enough to allow full utilization of their expertise. For example, the first consultant's services were originally planned for a period of nine months, but he only stayed a total of 2 1/2 weeks. The second consultant, although agreeing to stay longer, actually remained in Dar es Salaam for a total of one week. The total lack of follow-up to the consultancies visit on the part of Experience, Inc. (contractor), the USAID Project Officer, and the consultants themselves were major criticisms of the proposer. The proposer also maintains that there was no follow-up on the complaints made about the unsatisfactory performance of the two consultancies by either the contractor or the USAID Project Manager.

The Evaluation Team did not find any reference to the consultancies problem in the Mission's project files

III. External Factors

Implementation of the project was slowed down, because of problems with both water and electricity disruptions at the SIDO facility. Prior to the project, water had not been a problem in DSM but has become a chronic problem since 1981. Because of a shortage of clean water, the paper mill has been shut down for a total of 10 months on and off during the three years of its operation.

This water problem has since been resolved through relocation of this activity from SIDO facility to the new Nyumba ya Sanaa site on Upanga Road and Ohio Street in DSM. At this new site a water pump will be installed to obtain water directly from gound sources.

Electricity was another unanticipated problem at the SIDO facility.. Due to irregular power surges all the project's motors, ceiling fan, dryers and the beater had to be rewound because they had been blown. This forced extensive rewiring and installation of circuit breakers at the expense of the project.

Lint from the textile mills, initially used by the project in paper production, is no longer readily available. There is presently an alternative demand for the lint to stuff mattresses. Heretofore, imported foam rubber was used to produce mattresses locally. However the project succeeded in experimenting and using other locally available alternative material such as cats tails and banana fibres for paper making.

IV. Project Inputs:

(a) AID's contribution to this activity was $48,800. This funding was originally intended to procure three pieces of equipment and to fund travel and related expenses of two consultants. However, as noted earlier a revised budget changed AID's contribution to funding, namely, local construction, operating costs, labor, travel of two consultants, and purchase of raw materials.

(b) The proposer's contribution to this activity (equivalent to $61,100) was used to cover the remaining activities . The Evaluation Team found that all the activities included in the original project proposal were covered by the total project funding.

V. **Project Outputs**

It was planned that this activity would be replicable to other parts of Tanzania, would serve as a training site, would provide training to school leavers, and needed tools and equipment would be fabricated by SIDO.:

Planned Output	Actual Performance (April)
(a) Project activity to be replicated at sites chosen by SIDO.	Three more mills are planned for Morogoro, the Coast and Mara regions. However, in view of budgetary constraints faced by GOT, they are unlikely to materialize.
(b) Training site for mechanical mills like Kibo Paper Mill in Dar es Salaam.	Nyumba ya Sanaa is collaborating with Kibo Mill as well as the new Southern Pulp and Paper Mill in Mufindi and the Arusha Paper Mill which is run by the grantee of another IRT project, Traditional Pottery.
(c) Fabrication of equipment and tools by SIDO.	SIDO did not follow through on this commitment. The work was farmed out to area workshops under project costs.
(d) Establish work site and install project equipment using project funds	A facility owned by SIDO was leased and equipment installed However, the facility was inadequate due to water and electrical problems. The activity is being relocated to the new Nyumba ya Sanaa building in Dar es Salaam.
(e) Train school leavers	15 school leavers have been trained specifically in handmade paper technology. One full-time project manager has been trained and work generated for 70 employees.

VI. Project Goal Beneficiaries and Unplanned Effects

Fifteen Standard VII school leavers have realized full employment through the paper mill. One supervisor has been trained and manages the project. This does not account for spin-off projects such as printing, silk-screening and etching the paper. There are an additional 12 artists and craftspersons working on designing and printing. All of the prints produced by Nyumba ya Sanaa since 1981 have been on their own handmade papers. As of this writing, Nyumba ya Sanaa employs seventy Tanzanians full-time and the Handmade Paper Project component subsidizes the other components (jewelry, dressmaking, printmaking).

(b) Nyumba ya Sanaa's projected sales in 1981 were budgeted at 1.3 million Tanzanian shillings, but because of the paper mill their sales were 2.2 million shillings. The increase in sales was due to the fine quality prints, greeting cards and calendars produced by the paper mill. It should be recognized that this is an almost awesome achievement in Tanzania where most small-scale industries are failing due to the lack of raw materials or shortages of water and electricity.

(c) The paper mill is pioneering the research in papers using local fibers (cat-tails, papyrus tops, banana fibers and bulrushes) and to this end it has already created fine quality papers.

VII. Management of the Project

1. Presently, Sister Pruitt acts as an advisor to the activity and the present 70 members (staff), 100% indigenous, conduct operations much in the way of a cooperative. She has been extremely resourceful in securing in-country expertise for adapting and copying Western technology here, ensuring both availability of equipment and lower costs. The management of activity has been successful due to the high level of Tanzania participation in decision-making. Sister Pruitt has done an excellent job of mustering multi-donor support for the overall Nyumba ya Sanaa project. Several Tanzanians were sent to India to study paper-making under financing provided by CUSA. As previously mentioned NORAD is presently financing the construction of the new Nyumba ya Sanaa facility (approximate cost: $1,000,000 US).

2. It should be noted that the Mission project manager at the time of project approval did not personally endorse t'e project, because he felt that it did not qualify as an IRT type activity due to its relatively urban setting. Also, over the period of time between when the project was proposed and the evaluation (42 months) the project had been backstopped in the Mission by a succession of four different project officers.

VIII. Institutional Relationships

(1) This technology has been institutionalized in Tanzania.

(2) The handmade paper project in Dar es Salaam and the privately funded project of Mr. Sheriff in Arusha have cooperated closely in the past especially in regard to equipment adaptation and replication. The two projects also assist one another in the area of pottery making. Nyumba ya Sanaa has plans for a terra cotta pottery component at its new site. Sister Pruitt has communicated a strong desire for institutional relationships with handmade paper-making facilities in the U.S. and abroad which to date have been very weak.

(3) Additionally, the project has established relations with an institution in Zimbabwe and it is anticipated that there will be a cross-fertilization of skills and resources between the two activities.

IX. Replicability

The Handmade Paper Mill is supplying Tanzania's need for fine quality card stock, stationery and drawing paper, and even prospects of providing materials for eventual export to Norway, the Netherlands and the U.S. There exists the potential demand for replicability elsewhere in East Africa or anywhere in Africa. Due to the fact that handmade paper can be made from local available materials, the only significant constraints to replicability are initial equipment outlays, availability of raw materials and training.

IMPROVEMENT OF TRADITIONAL POTTERY (698-0407.11)

I. Project Purpose:

To develop efficient methods of testing varieties of locally obtainable clays suitable for pottery works in the Arusha region.

II. Evaluative Summary:

The grantee, Ali Sheriff, is a small businessman who was recommended by the Tanzanian Small Industry Development Organization (SIDO) for technical assistance in pottery making. The original LOP funding of $25,000 was increased in July 1981 by $33,000 through a project amendment making the total LOP $58,000. This additional funding was needed, because of increases in the costs of the equipment and shipping charges. A waiver was obtained for the purchase of the equipment from U.K. This evaluation assessed the effectiveness of project inputs in assisting the designated beneficiary groups in testing and identifying regional clays for pottery production.

The project funds provided by AID were used exclusively to procure specialized testing and processing equipment.

The evaluation team found that the equipment has reduced the testing time of area clays suitable for pottery from 1 to 2 weeks to a few days. It has also allowed the identification of refractory clays used in developing glazes for pottery and locations of these deposits in the Arusha region. The pug mill equipment which prepares the clays for molding has significantly reduced the processing time and allows the Project Manager to concentrate on training and to undertake mass production of ceramic household items. The plant at Arusha has established a market for its products and is beginning to realize a profit.

A map giving the locations and types of clays found in a 15-mile radius of Arusha has been prepared by the Project Manager, as a result of test findings. The project equipment was also used in identifying good clay sources in the Dar es Salaam area. The equipment has permitted the identification of local lime and pumice rocks for use as building materials.

Another spin-off of the project has been the use of the ball mill equipment in the processing of local gypsum rock from its original state into a substance for making a plaster of paris for ceramic molds. The excess plaster of paris is being donated to a nearby hospital in the area (KCMC) for use in cast making. Plaster of paris for all other medical facilities in Tanzania must be imported from abraod with foreign exchange.

At the time of the evaluation, two of the three designated beneficiary groups were no longer active in pottery making. The two groups (Arusha Prison and Arusha Primary Boarding School) had ceased pottery operations due to the transfer of key individuals at both sites who were initially involved in this enterprise. Only one of the original beneficiary groups, Singisi Village is still actively engaged in pottery making. Singisi employs seven people full-time and has constructed a kiln for processing the pottery into ceramics. The Singisi kiln constructed under the direct supervision of the Project Manager (Ali Sheriff) and a Danish volunteer, is now operable. Unfortunately, the Singisi kiln is only fired once a month thus limiting the production potential and income generation. The drop-out of the two original groups, although disappointing, is not considered a reflection on the project manager. The potential exists for making this activity into a self-sustaining operation by participating groups.

The evaluation team feels that more beneficiary groups will be identified as the project continues, with the only constraint being the availability of the Project Manager for training and technical assistance.

III. External Factors:

The reassignment/transfer of the former prison warden at the Arusha Prison by the GOT has resulted in the termination of the pottery workshop on-site. The transfer of the Principal at th e Arusha Primary Boarding School has likewise ended the students' participation in a small pottery workshop.

At Singisi, the appointment of the local village CCM (single political party) Chairman as project overseer is restricting operations.

IV. **Project Inputs:**

Project inputs include:(a) $58,000 provided through AID grant to Ali Sheriff for the procurement of equipment for testing purposes, and (b) TShillings (equivalent $48,000 host country contributions) to cover the costs for installation of the equipment and the salary of grantee.

V. **Project Outputs:**

Purchase of three pieces of equipment, which would allow the testing of area clays and the conduction of experiments and TRG seminars:

Planned Outputs	Actual Performance (April)
Small Capacity Clay Prep Plant Studio Type Horizontal Pug Mill Electric Starter for the Pug Mill Brick Lined Ball Mill	Received and installed in the pottery plant in Arusha
- 3 Initial Experiments	Completed
- Seminars	One at Singisi
- Final Report	Received November 1982

Interest by other artists and other organizations generated outside of the Arusha Region has resulted in the training of four extra people and the eventual establishment of pottery workshops outside the project area.

VI. **Project goal, Beneficiaries, Unplanned effects:**

(a) The primary goal was to assist local groups (designated beneficiaries) in the Arusha area involved in pottery making by identifying the types, locations, and grades of local clays using the special testing equipment and to provide technical assistance in establishing small pottery industries and assist small pottery production in the area.

(b) Two of the three designated beneficiaries are no longer active in the project, however, two new groups and many others will benefit from the project. It now has the potential of expanding beyond the Arusha region. At present, Nyumba ya Sanaa (House of Art in DSM) has asked for technical assistance in establishing a pottery making industry. The grantee has also received expressions of interest from a small village at Magogoni, Kigamboni Division (near DSM) where a private potter plans to start a pottery business and has sent a participant for training.

The identification of good clays in that area by the grantee using AID equipment has strengthened this enterprise's chances for success. The area map of clay deposits in the Arusha area will significantly reduce the time needed to determine clay quality for participating villagers. They need only to visit the area and obtain the clay. The equipment has helped in identifying refractory clays used in developing glazes for ceramics. Presently, such glazes are imported.

The clay pug mill affords the speedy process of clay kneading, heretofore done by hand. This allows the mass production of pottery items and allows additional time for training school leavers working in the Arusha pottery plant. A good market exists for the household items (cups, saucers, pitchers, etc.) now being produced from the grantee's workshop. At the same time, it allows the expansion of this enterprise and the generating of training and employment for the school leavers employed. The grantee is developing a self-sustained industry while at the same time allowing for training and income generation.

(c) <u>Unplanned Effects:</u>

Development of plaster of paris for multipurpose uses was a by-product of the project. Plaster of paris ceramic molds permit mass production of household items by speeding the drying process in preparation for firing.

A by-product of the project has been the discovery of a way to use waste fuel in fueling the kiln. This is viewed as a major technological breakthrough which decreases the end cost of the items produced and lessens dependence on the very uncertain supply of imported fuel into Tanzania.

Training afforded for people outside of the project area has been accomplished. Seven people have been trained four from outside the Region in addition to the school leavers at the Arusha factory site.

Additional workshops now being established outside the project focus, at Nyumba ya Sanaa (DSM) and the construction of a kiln; and a smaller workshop at Kigamboni near DSM.

The construction of needed equipment for the plaster of paris operation is planned and should generate more employment in Arusha.

VII. Management of the Project:

Mr. Ali Sheriff, Grantee, is the principal manager of the project. His managerial capability is excellent. The only constraint is finding time for managing the plant, training and conducting outside training seminars. Mr. Sheriff does have a plant assistant but he has not relinquished the major training and management activities. He is willing to train people interested in establishing pottery workshops. The termination of the pottery workshops at the Arusha Prison and Arusha Primary School is not attributable to Mr. Sheriff's management.

VIII. Institutional Relationships

The project has helped institutionalize pottery production and advanced this technology one step further into ceramic production - a new concept. The possible mass production of ceramic items for households (cups, saucers, plates, etc.) is now being tried with success. A ready market exists for the end product in the Arusha area, Moshi and in Dar es Salaam.

IX. Replicability:

The improved pottery production technology is appropriate for Tanzania because of the nominal investment and the local availability of clay. The only constraint is the fuel requirement for the kiln in ceramic production. The country has a wide variety of clays suitable for pottery and the expansion of technology is easily replicable elsewhere. To date the project manager has received numerous requests for technical assistance and training. Two of these requests originated outside the project area of Arusha.

As mentioned previously, Nyumba ya Sanaa (DSM) and a private individual near DSM (village of Kigamboni) are seeking to establish pottery workshops, using like methodology (and providing participants for training.) The requests for technical assistance in kiln construction at these two sites near DSM has been received. As previously mentioned, the project manager has trained seven participants during LOP in the use of project testing equipment, and pottery making and kiln firing for ceramics. At Singisi seven people are employed full-time on this project, three of whom have been trained by the Project Manager.

(a) Constraints to Replicability vary depending on location.

1) At the Arusha workshop, the fuel problem for the kiln has been resolved by using waste fuel collected from local garages; 2) Major constraints to production are the time required to fire the kiln (18 hours) for ceramics and the kiln's limited space for production items; 3) Time constraints of the project manager in providing technical assistance to others will increase as additional requests are received from interested parties and groups. Presently, the Project Manager, while managing his own workshop, is engaged in training of school leavers and responding to requests for TA; 4) At Singisi, the collection and transport of wood for fueling the kiln is a major constraint. Also, the appointment of the local village CCM leader to oversee the pottery project and dispense project funds has effectively curtailed the production potential at Singisi. The fee charged by landowners for the collection of clay is minimal and not considered a major project deterrent.

SEAWEED FARMING (698-0407.21)

I. **Project Purpose:**

To test the applicability of Seaweed Farming, as presently practised in the Philippines, to Tanzanian conditions.

II. **Evaluative Comments:**

The team found that the success of this project activity is strongly linked to Dr. Mshigeni, Project Manager, and Chief Botanist, University of Dar es Salaam. Dr. Mshigeni conceived the adaptation of the seaweed technology to Tanzania and submitted a proposal for AID funding. His interests in overseeing the project's success are both technical and personal.

In the proposal three sites were suggested:
At Kigombe, near Tanga on the mainland; on the island of Zanzibar; and on the island of Pemba.

The Seaweed Farming technology was found to be appropriate because the conditions for cultivation are similar to the Philippines and is easily adaptable to Tanzania. The evaluation team found that the project has successfully transferred seaweed farming technology to Tanzania through the training of three (3) farm managers in the Philippines. The PACD for this activity was extended by six months when a hurricane damaged the training site in the Philippines. Despite this initial setback, most of the project objectives are now on course.

The evaluation team was impressed with the caliber of the training provided in the Philippines and with the selection of the participants. In Tanga region, the site visited, the Project Coordinator was fortunate in finding and recruiting a villager from Kigombe - site of the project - as the seaweed farm manager. The probability of retaining this person is greatly increased and therefore continuity of management, a persistent problem in most projects in Tanzania, will be ensured. In Tanga region, the most impressive achievements were the local support among the villagers for this project and the opportunities presented for income generation for the individual participating villagers.

Regrettably, the postponement of training resulted in delay in producing a pilot crop and, therefore, the evaluation team could not use an initial crop as an indication of the project's long-term, viability. There is some concern that this activity, owing to its labor intensiveness, will compete with the daily fishing activities of the participating villagers.

While this project is considered a profit-making venture, the tradeoffs may prove too high (fishing versus farming). Further, the team believes that the stated project goal of 150 tons of seaweed for export may be too optimistic. The project goal of 150 tons of seaweed for export within 12 months is based on a formulae of four crops per season. However, at present it is unknown how the weather and changes in the tides will impact on this projection. The project is also unclear as to how the seaweed farming sites will be chosen and divided among participating farmers. The method for handling seaweed exports from the mainland is still vague and needs clarifying. Both Zanzibar and Pemba have the Zanzibar Trading Corporation for exporting of seaweeds. Such an organization does not exist on the mainland. It is proposed that initially the mainland will sell to the Zanzibar Trading Corporation until export links can be established. A future direct export of seaweeds may be unrealistic and require additional expense to pay for transportation and packaging.

Several local industries are being supported by the project through the local procurement of material, tools and equipment.

III. <u>External Factors</u>:

1. The hurricane at the proposed training site in the Philippines seriously impeded project implementation.

2. The activity is directly affected by the envisaged constantly increasing foreign demand for the eucheuma seaweed variety. Should a satisfactory alternative be found for the end product, the market for Tanzanian eucheuma would evaporate.

IV. **Project Inputs:**

Project inputs include (a) $87,000 provided through AID grant to University of Dar es Salaam and TanGov for the procurement of a project vehicle, diving equipment, commodities and funding Third Country training for three farm managers; and (b) TanGov and University of Dar es Salaam:

- Two part-time consultants from Department of Botany, University of Dar es Salaam
- Services of GOT fisheries personnel, Ministery of Natural Resources
- Project fuel and maintenance
- Salary of Kigombe Farm Managers
- Administrative Costs

V. **Project Outputs:**

This project proposed to: (a) increase current export production by 150 tons; (b) train three seaweed farm managers, one at each site, print a manual, construct demonstration plots, conduct seminars, install a dryer and increase FX and the income of participating villagers.

Planned Outputs by PACD	Actual Achievement as of 4/15/83
1. Train 3 Seaweed Farm Managers	1) Three Farm Managers returned from the Philippines following a 3-month training program. They are now employed at each project site
2. Print a Seaweed Farming Manual in Swahili	2) Galley prints for subject manual have been reviewed and edited by Project Manager. Final copies should be completed by mid-May in time to coincide with training seminars.
3. Pilot Farming Plots Surveyed	3) Pilot plots have been surveyed. Seedlings have been produced and first harvest is expected end of May
4. (3) Seminars Conducted	4) Owing to postponement of training, this has been delayed. However, initial training has taken place for laborers involved in the project.

5. Solar Seaweed Dryer Constructed at Tanga	5) Not as yet constructed - planned for June
6. Production of 150 Tons	6) Not yet accomplished due to late late project start and training
7. Equipment and Commodities	7) Vehicle delivered; 50% of needed commodities received. Balance will arrive by PACD.
8. 150 Tons of Seaweed for Export	8) Not yet realized due to delay in training

VI. <u>Project Goals, Benefits and Unplanned Effects</u>:

(a) Goals:

- train three farm managers
- generate income from seaweed
- technology transfers.

The Project has succeeded in developing a potential income diversification in coastal areas and villages:

- Training and dissemination of the technology has resulted in a better awareness by the participating villagers to the surrounding marine life and the value of seaweed species once considered useless;

- Area villagers are more knowledgeable of plants and the environment and the need for protection thereof;

- Seaweed farming will enhance the natural habitat of fish, thereby fostering continuous fishing activity;

- It was not anticipated that Kigoma would be able to establish a direct linkage with exporters for this product;

- It will promote cottage industry by allowing involvement of women in the preparation of lines/strings needed for planting;

- Research of sisal fiber as a replacement for mylar cords purchased abroad may support additional local industry;

- Research of other seaweed varieties in Tanzania has been fostered;

- The need for a system of accounting for villagers use of supplies, assignment of plots and actual production amounts must be devised. This was not planned.

VII. Management and Implementation of the Project:

The management provided by the University of Dar es Salaam has been good. Dr. Mshigeni, Chief Project Manager, has provided strong leadership and has a productive working relationship with the project farm. Project Manager responsibility is to be shared with another faculty member, Dr. Semesi.

The amount of time the two project managers can devote to this activity will depend on other priorities, especially teaching at the UDSM and international travel. The Project manager expects to locate additional sites and train new farm managers based on a pyramid training program concept. The University of Dar es Salaam is expected to withdraw its support once the sites become self-sufficient.

The project relies heavily on the farm managers to train, recruit, and manage all aspects of the project. This is true especially at Kigombe, where, unlike Pemba and Zanzibar, the project does not benefit from the support of the Fisheries Division, Ministry of Natural Resources and Tourism.

The IRT contractor, Experience, Inc., provided technical assistance to the University of Dar es Salaam in the redrafting of a revised proposal. Their assistance was limited to that project activity.

VIII. Institutional Relationships:

1. At 2 of the 3 project sites, the seaweed farming activities have been integrated into the responsibilities of the local fisheries officials. The possibility exists for the development of business relationships between Kigombe Village and foreign markets.

2. Research results applied at the grass roots level has fostered a linkage between UDSM and the beneficiaries.

IX. Replicability:

The potential exists to replicate this activity at numerous other sites along the Tanzanian coast as well as in other countries with similar environments.

PHOTOVOLTAIC ENERGY FOR VILLAGE DISPENSARY (698-0407.22)

I. **Project Purpose:**

To install a photovoltaic generation system, lighting and refrigerator in a rural village; collect and evaluate data for future applications with solar generator.

II. **Evaluative Comments:**

This project was conceived as a research activity for the Department of Electrical Engineering, University of Dar es Salaam. The proposal planned to test the practicality of solar energy usage in rural areas by hospitals and dispensaries. The project was to provide a model for low-cost, maintenance-free electrical power in rural communities outside the electrical grid.

The photovoltaic energy idea was conceived by Dr. Droge, expatriate and senior lecturer on the University faculty. Unfortunately, Dr. Droge left the country shortly after the project was approved. University faculty members involved with Dr. Droge in the initial proposal stages and knowledgeable of the project also left within the first six months following project approval.

The project failed to reach the implementation stage by the time of PACD expiration. Procurement of project equipment and commodities for construction of the Photovoltaic equipment were never initiated. The activity suffered from departures of key university technical staff and from changes in Project Managers. The university's unfamiliarity with AID's guidelines and regulations on the constraints and the significance of the PACD were also factors which contributed in delaying implementation.

USAID/T began to question the appropriateness of this technology for Tanzania during the above disruptions and personnel changes. Another concern of USAID/T was the feasibility of this technology at all rural health dispensary sites given the costs involved. In view of USAID/T's stated concerns and the serious management problems, an in-house decision was made not to extend the PACD, effectively terminating the Project.

The Evaluation Team found that all the parts and equipment needed for the construction of a photovoltaic plant are expensive and have to be imported. Furthermore, from the standpoint of initial investment, the photovoltaic energy alternative is only advantageous as long as there is a very low demand for electricity. Once demand for electricity increases, conventional sources become equally attractive. In view of the above the Team concluded that the decision made by USAID/T to terminate this activity was correct.

At the time of PACD expiration, the only Project expenses incurred were for the travel and per diem of two University staff members to the U.S. This travel was for the purpose of reviewing available solar energy equipment. At the time of the evaluation, $22,362.36 remained unexpended and a request to retrieve these funds has been initiated by USAID/T.

III. External Factors:

- Departure of Dr. Droge, Senior Lecturer and Project Proposer, funded by West Germany.

- Departure of the first University Project Manager, Dr. Mariki.

IV. Inputs:

The inputs provided for this project include:

a) $32,000 in AID funds for travel of two technical advisors and for procurement of equipment and commodities.

b) $14,000 from the University of Dar es Salaam and GOT for the salaries of the University project technicians, use of laboratory facilities and operating and construction costs.

V. Project Outputs:

Planned Outputs by PACD	Actual Achievement at Time of Evaluation (April)
Travel of two University staff members	Completed February 1982
Procurement of commodities and equipment	Not accomplished

Construction of photovoltaic model at Mjawa	Not accomplished
Final report	NAN

VI. Stated Project Goals, Beneficiaries and Unplanned Effects:

a) The project goals were not realized,
b) Beneficiaries - not realized,
c) Unplanned effect - not realized.

VII. Management of the Project:

The primary reason for USAID/T's decision not to extend the PACD was the inadequacy of project management by the University. The uncertainty about the departure date of Dr. Mariki, the first Project Manager, dragged on unresolved for months. The formal appointment of Mr. Materu as new Project Manager was not made until July 1982, a month before the PACD expired, although his successor's (Mariki's) pending departure had been known since February 1982. The faculty members interviewed did not assign a high priority to project management. They are more inclined to consider technical needs as the priority. The project was assigned both a Technical Coordinator and Project Manager. It was unclear how these two roles meshed with respect to project goals and implementation. This point was not clarified during the evaluation interview.

The evaluation team learned that the Department of Electrical Engineering staff did not quite understand why the project had been terminated and were under the impression that funds could still be expended if USAID/T approved. Further, the faculty was unfamiliar with AID guidelines and procedures for projects. As an example, Mr. Materu, the new Project Manager, did not ask for a PACD extension until mid-August 1982, a few days before PACD expiration. The formal request for extension was not received by USAID/T until November 1982.

VIII. Institutional Relationship:

NAN

IX. Replicability:

Unknown

RUVUMA FISH FARMING (698-0407.32)

I. **Project Purpose:**

Establish fish culture projects in 12 rural communities in Ruvuma region, Tanzania; increase indigenous fish production by transfer of basic technology at the village level.

II. **Evaluative Comments:**

The project concept was initiated by Harold Upton, a Peace Corps volunteer in Ruvuma region. The project concept is based on working with villages and groups as opposed to working with individual farmers. At present three PCVs, including Upton, serve as project managers, with responsiblity for the day-to-day project activities and training.

The project enjoys broad support at both the district and the regional levels. Ruvuma officials foresee that stated project goals can be achieved. The project has the potential to meet two primary development goals of the region:

(1) address a nutritional deficiency in protein, and
(2) provide income generation.

The Evaluation Team found that the greatest interest for this fish farm project has been generated by the private farmers anxious to diverisfy their income and gain the increased technology.

The evaluation revealed that while the potential exists for achieving the stated project goals, the institutionalization of this technology is dependent on the GOT officials assuming responsibility for technology transfer. Presently, the three PCV managers are doing all of the training of the project participants. They are also assuming the responsiblity for the total project. The fisheries extension agents in Ruvuma should be performing these tasks and the PCVs could be better utilized as technical advisors only. The project goals proved overly ambitious given the Life of Project time-frame (18 months) and existing major constraints. Major constraints such as transport, fuel uncertainty, poor roads and the weather have impacted adversely on stated project goals.

The PCV project managers have done a commendable job in view of constraints faced in implementing this activity. The lack of progress to date and unforeseen delays are not attributable to project management but to the Region's major problems cited above.

Further, the spread of this activity over three districts has minimized its effectiveness owing to the logistical problems cited above. Additionally, the project region is primarily agricultural. The long rainy season this year has adversely impacted causing delays in pond construction. The farmers in the villages tend to work on the ponds once the daily agricultural chores are over, weather permitting. We believe once the project proves successful that area farmers will arrange to build ponds during the off-season when agriculture does not compete.

The logistical problems in the Ruvuma region were not foreseen by the planners. The three districts in which this project is being implemented have major logistical problems which can only be solved if given sufficient time.

At the time of the evaluation, two of the 12 communities had completed pond construction. Another four communities are nearing completion of pond construction. The two complete sub-groups will begin receiving their Tilapia fingerlings within a few days. A six-month incubation period is required before the fish can be harvested. The PCV project managers are planning to stock a special Tilapia hybrid variety known as "Tilapia Nilotica" which has a shorter maturity time, more meat, and has adapted well to the area. This special variety has to be transported from Lindi, Tanzania, some 500 kilometers away, and will require GOT transport support.

A critical phase will be reached when the current tours of the PCV Project Managers end. One PCV has left, another is leaving at the end of April 1983 and the remaining two volunteers will be leaving in December 1983. Originally, there were four PCV's on the project and it is unclear when the replacement PCV fisheries candidates will arrive in Ruvuma.

III. External Factors:

Factors which will impact on this project include:

(a) Government of Tanzania (GOT) ability to fund project vehicle, fuel and maintenance and transfer of technical implementation responsibilities to Tanzania fisheries officers;

(b) Weather;

(c) Competition with agriculture; and

(d) Availability of fingerlings.

IV. **Project Inputs:**

Project inputs include:

(a) $57,000 provided through AID grant to GOT for procurement of a vehicle, spare parts, equipment and supplies and funding of local costs for tools, fuel and vehicle maintenance;

(b) PC Volunteers as Project Managers;

(c) Technical assistance from the GOT in-kind; Fisheries Extension workers - $5,800;

(d) $49,200 in-kind labor by project villagers based on 12 sub-groups of 15 persons each engaged in pond construction.

V. **Project Outputs:**

This project proposes to produce 800 kilograms of fish per sub-group generating approximately $2,000. Train 420 people in twelve community groups in fisheries technology, construction of four ponds in each of the twelve sub-project areas. Issue manuals and posters on this technology.

Planned Outputs	Actual Performance at Evaluation April 22, 1983
1. Ordering of vehicle and spare parts	1. Vehicle received 9/82, still awaiting spare parts arrived during the evaluation.
2. Ordering of equipment nets, pipes and project materials	2. 50% of project equipment received; pipes for ponds have been received; awaiting nets ordered; and transport of pipes to Tunduru.
3. Construction locally of tools for crews	3. 100% procured and distributed.
4. Field survey and site selections	4. Completed by PCV Project Managers
5. Pond Sites surveyed	5. 100% completed by PCV Project Managers.
6. All ponds constructed	6. 25% completed owing to weather and transport problems.

7. 420 people trained in twelve participating communities	7. Approximately 50% of participating villages (210 people) have received instructions and monitored weekly.
8. 12 sub-projects provided with fingerlings	8. Only two sub-groups are ready to receive fish fingerglins; 5-6 months is needed before harvesting.
9. Production of 800 kilograms of fish per sub-group, generating $2,000.	9. Harvesting is behind schedule. It will take 6 months after introduction of fingerlings before harvest can be realized. The potential exist for achieving this goal by December/January. A market is readily available for consumption.
10. Fish Farm Manual publication and distribution; posters and publicity	10. The manuals in Swahili have been completed and distributed. Posters on nutrition and pond construction have been distributed to participating villages and groups.

VI. Project Goals, Beneficiaries and Unplanned Effects:

(a) Project Goals:

Technology transfer to 420 people in 12 communities trained in pond construction, management, breeding, stocking and marketing. Production of 800 kilograms of fish, with retail value of $1,200; per sub-group.

(b) Beneficiaris:

- six sub-groups participating in the project
- two schools located in Songea
- women's groups in Songea.

(c) Unplanned Effects:

- large response from private farmers interested in increasing their income was not anticipated by the PC Project Managers initially. PCV's have tried to respond, but as a result are spreading themselves thin.

- interest of schools and other groups in fish farming over extension.

- logistical problems experienced in the region slowed project implementation.

- impact of the weather on stated project goals.

VII. Management of the Project:

PCVs Management of the Project is in addition to their other activities. PCV Project Management has been excellent, however, their role should be restricted to advisors only and not trainers and implementors. Implementation should be the responsibility of the fisheries extension workers. The critical need for transport between the districts in Ruvuma has necessitated the rotation of the one project vehicle usually on a weekly basis as needed among the three remaining Project Managers. One of the lessons learned is that the transport and logistical problems are critical to project success.

Project Vehicle

The project provided one Land Rover for use in three districts. At present the vehicle is rotated among the three remaining PCV's Project Managers on the basis of need. The PC Project Manager having the most urgent need for movement of supplies and transport uses the vehicle in his district. When finished, the vehicle is given to the next PCV Project Manager in the adjacent district.

This arrangement, while cumbersome, is working at present. However, it remains to be seen what will happen once the present PC Project Managers leave and replacement candidates arrive. Provision of fuel for the project vehicle varies within the three districts in Ruvuma. In Songea, project funds are used to purchase fuel from local distributors. However, in Tunduru the district officials provide fuel for the project vehicle without cost when needed and likewise in Mbinga district. Approximately 20% of project funds are earmarked for fuel. A tacit arrangement has been made with the RDD whereby he agreed to provide vehicle fuel once project funds are exhausted, however, this needs to be confirmed in writing.

Repairs to the project vehicle have heretofore been made by the GOT garage and the project charged. The PVC Managers now plan to make arrangements with a private garage in Songea on a monthly basis to cover monthly maintenance and repairs until project funds are exhausted. Afterwards the RDD has agreed to handle such maintenance costs as well as fuel. This arrangement should be set forth in the final Report.

The PC Project Managers and USAID/Tanzania have obtained an agreement with the area officials as to the vehicle's use as per a Memorandum of Understanding dated October 4, 1982.

B) Accountability of Project Funds

At the beginning of the evaluation concern was expressed about the bookkeeping and management of project funds allotted directly to the RDD, Ruvuma to cover local operating and project costs. A total of Tanzania Shillings 566,000 were provided. The evaluation team discussed the project accounting with the RDD and met with the accountant and bookkeeper to review project records. The evaluation team reviewed the principal ledger at the RDD's office and all available project receipts on funds expended. Verification was made of most ledger entries for funds expended. The RDD has agreed to certify that project funds were used exclusively for the project as part of the final project report due in September. This should suffice the needs for future audits. Approximately $10,000 remain in local currency (90,000 T.Shs.). Most of this is earmarked to settle commodity shipments for pipes and other materials still outstanding. The balance will be used to procure a maintenance contract for the project vehicles and to cover fuel costs until the PACD.

VIII. Institutional Relationships:

The Fish Farming activity has been linked to the on-site Regional Division of Fisheries, Ministry of Natural Resources. The extension officers are assisting with the follow-up services to participating villages only. The Division of Fisheries must become more involved in the actual implementation of the project if it is to. The PCV's are usurping the role of the fisheries officers. The Tanzanian Government must pick up the responsibility for the project eventually.

> Peace Corps and officials of RDD need to establish a turnover of implementation responsibilities to the extension agents.

IX. Replicability:

The evaluation found fish farming and pond construction is appropriate technology for Tanzania. The resources are available in-country for replication of like activities.

The project can be replicated throughout the Ruvuma region where fish is in short supply once the technology transfer has occurred, but only if the Tanzanian Government takes over implementation. It can also be replicated in other regions in Tanzania as well as in neighboring countries. Such technology is being used in Africa on a broad scale.

CONCLUSIONS:

Agency Prorities

1. IRT type activities complement the Agency's new four stated goals to foster private enterprise, encourage technology transfer, support institutional building and provide training.

2. Development Goals

IRT type activities, while small, do address a development need in countries like Tanzania. The impact in relation to AID funding inputs is significant. In Tanzania, the activities funded were outside of the primary focus of bilateral assistance which is agriculture. The recipient grantees/co-sponsors affected by such activities have promoted goodwill for the Agency at the grass roots level.

3. Orientation on AID Guidelines

The lack of pre-proposal orientation on USG regulations, procurement waivers, contract modifications and the significance of PACD caused implementation problems for several of the IRT proposers.

4. USAID Project Management of IRT Activities

The IRT projects suffered from benigned neglect owing to other USAID/T priorities, bilateral activities and time demands on the various project managers. During the life of these IRT activities and time demands on the various project managers. During the life of these IRT activities, four different USAID/T project managers were assigned to oversee the projects. A breakdown of communication between the USAID/T and the various grantee/cooperating sponsors occurred, and in one case, Photovoltaic Energy, this breakdown resulted in some confusion on the meaning of PACDs. In such cases, communication should be strengthened.

5. <u>IRT Contractor Responsibilities</u>

The IRT project contractor, Experience Inc., provided uneven and sporadic support to the three activities in which it had some input. In all cases, the services provided were evaluated as less than satisfactory by the proposers interviewed. Experience Inc. identified two of the three IRT activities for AID funding and promoted their approval. However, once this was accomplished, the contractor failed to provide the needed follow-up services and give guidance to the proposers.

In one case (Handmade Paper) this lack of follow-up led to numerous problems during the project implementation stage. The contractor could have assisted in orienting the IRT proposers about AID's regulations, procurement procedures and waivers. Instead this was not done and in one case, the proposer ordered equipment from a non-U.S. source. In the case of the Photovoltaic Energy activity, assistance was requested from Experience Inc. in backstopping two University faculty members interested in identifying project solar energy equipment in the U.S. Experience Inc. failed to assign a backstop knowledgeable in either engineering or solar energy. Instead the contractor assigned an agricultural type to coordinate the visit. This resulted in the technical assistance being limited to setting up and scheduling travel appointments.

EVALUATION OF IMPROVED RURAL TECHNOLOGY PROJECTS IN TANZANIA

AFRICA BUREAU TECHNOLOGY TRANSFER REPORT

The report compiles the answers on all five IRT projects under the respective questions:

Q1: WHAT CONSTRAINTS DOES THE PROJECT ATTEMPT TO OVERCOME AND WHAT DOES IT CONSTRAIN^?

698-0407.05 - HANDMADE PAPER

(a) The lack of machinery, knowledge and training on how to produce quality handmade paper products locally for consumers;
(b) Scarcity of foreign exchange for imported paper products due to other GOT budgetary priorities;
(c) High cost of imported quality greeting cards, prints and stationery which restricted the availability of such items to the public, artists and consumers; and
(d) Lack of retail outlets for such products because of unreliability of supply.

698-0407.11 - TRADITIONAL POTTERY

(a) Time-consuming methods of identifying and testing local clays suitable for pottery making;
(b) Lack of technology and equipment needed to identify and test refractory clays needed in the production of ceramics;
(c) Time-consuming traditional means of kneading and preparing clays for pottery production, thereby limiting the quantity of items produced; and
(d) Inefficient means for testing local clay deposits in the Arusha area and elsewhere.

698-0407.21 - SEAWEED FARMING

(a) Ineffective way of harvesting local seaweed varieties suitable for export;
(b) Limited income generation from seaweed exports due to uncertainty of crops;
(c) Lack of ways to diversify and improve income of coastal fishermen; and
(d) Lack of knowledge and technology on cultivated seaweed production among GOT Fisheries Extension Division and coastal fishermen.

698-0407.22 - PHOTOVOLTAIC ENERGY

(a) Unreliable electrical source at rural hospitals and dispensaries. Lack of a cheap, relatively maintenance free energy source which is dependable for rural hospitals and dispensaries. If successful, it would improve the health services of rural hospitals by affording cheap and dependable energy for storage of medicines and care of patients.

698-0407.32 - RUVUMA FISH FARMING

(a) Ad hoc and ineffective construction of fish ponds for area farmers and groups;
(b) Lack of a protein source in Ruvuma region; and
(c) No alternative source of income in the predominantly agricultural community of Ruvuma.

Q2: WHAT TECHNOLOGY DOES THE PROJECT PROMOTE TO RELIEVE THIS CONSTRAINT?

698-0407.05 - HANDMADE PAPER - The project sought to provide machinery, equipment and tools coupled with training and consultants to provide technology transfer to institutionalize this concept. The training and technology transfer has greatly improved the quality of handmade paper equipment.

698-0407.11 - IMPROVEMENT OF TRADITIONAL POTTERY - The project provided equipment used to test local pottery deposits and facilitate the preparation of clays for mass production of end-use items. The project equipment has allowed for the identification of clay deposits in Arusha and the identification of refractory clays suitable for ceramic production. A spin-off to this activity has been the use of this equipment in processing of gypsum for the production of plaster of paris and in the identification of building material.

698-0407.21 - SEAWEED FARMING - Organized cultivation of seaweed in coastal areas through technology transfer (training) will replace random harvesting of seaweed varieties for export. It will allow the generation and diversification of employment in coastal areas.

698-0407.22 - PHOTOVOLTAIC ENERGY - Introduce the use of solar energy to supply power to rural dispensaries and hospitals, and thereby provide a more affordable source of electricity.

698-0407.32 - RUVUMA FISH FARMING - Through a combination of providing basic tools and implements, together with on-site training in pond construction, and publication of instruction manuals in Swahili, the project hopes to institutionalize this concept. Technology transfer will be achieved when the GOT fisheries extension agents adapt the technology into their on-going jobs.

Q3: WHAT TECHNOLOGY DOES THE PROJECT ATTEMPT TO REPLACE?

698-0407.05 - HANDMADE PAPER

(a) Poor and inferior quality of locally-made handmade paper products;
(b) Limited material identified as suitable for paper-making in Tanzania;
(c) A small number of part-time employees engaged in paper-making production;
(d) Limited employment opportunities for employees engaged in handmade paper production activities.
(e) Lack of a viable vocation skill for school leavers in urban areas; and
(f) Unorganized and sporadic production of handmade paper production.

698-0407.11 - IMPROVEMENT OF TRADITIONAL POTTERY

(a) Laborious, inefficient and time-consuming methodology (weeks) required for testing clays to determine suitability for pottery making;
(b) Binding requirement of potters to live adjacent to their sources of clay to ensure known resource rather than capability to identify other sources;
(c) Limit to making finished pottery items;
(d) Technology limited to first stage of pottery rather than processing to the ceramic stage; and
(e) Increasing production and thereby income and improving the quality or process to the stage of ceramics was either not recognized as feasible or envisioned as immediate goals in rural area.

698-0407.21 - SEAWEED FARMING

(a) Ad hoc collection of seaweed varieties found growing wild for export; and
(b) Fishermen income limited to seaweed found growing wild and collectible from the seabed and shore. No method heretofore to plan for increasing the quantities of seaweed varieties suitable for export.

698-0407.22 - PHOTOVOLTAIC ENERGY - Small generators at rural facilities require constant maintenance and fueling.

698-0407.33 - RUVUMA FISH FARMING

(a) Antiquated and limited technology in fish farming and pond construction introduced briefly in the early 1950s;
(b) GOT failure to incorporate fish farm technology into their regular training program and responsibilities of the Area Fisheries Extension AGents. Although this technology was introduced in the 1950s, it was never institutionalized to the point of follow-up;and
(c) Lack of basic hand tools, information and technology on construction of fishponds.

Q4: WHY DO PROJECT PLANNERS BELIEVE THAT INTENDED BENEFICIARIES WILL ADOPT THE PROPOSED TECHNOLOGY?

698-0408.05 - HANDMADE PAPER - The technology has already been adopted because of viability of the overall project. Great demand exists for the end product and the mill has been very successful in training a permanent staff.

698-0407.11 - TRADITIONAL POTTERY - Entities interested in producing pottery are increasingly in need of better quality material (clay) to work with and require knowledge of where that material is available. A ready market exists for end products and household items.

698-0407.21 - SEAWEED FARMING - The technology transfer is feasible and appropriate to the Philippines settings. Coastal villages will adapt the new technology in order to increase production and maximize incomes.

698-0407.22 - PHOTOVOLTAIC ENERGY - It was thought that this technology would be adopted simply because the task of supplying fuel for generators at rural locations has proved to be an almost insurmountable obstacle. However, given the need for imported goods, this new alternative technology would probably have had its problems as well, particularly regarding the necessary initial capital outlays.

698-0407.32 - RUVUMA FISH FARMING - The project inputs are entirely available in country and there is a definite felt need to increase the source of protein and diversify incomes.

Q4: WHAT CHARACTERISTICS DO INTENDED BENEFICIARIES EXHIBIT THAT HAVE RELEVANCE TO THEIR ADOPTING THE PROPOSED TECHNOLOGY?

698-0407.05 - HANDMADE PAPER - School leavers (paper mill employees) are eager for work, young and adaptable. These people must exhibit some degree of artistic ability/talent to qualify for their jobs.

698-0407.11 - TRADITIONAL POTTERY - Traditional potters are experienced in "coil and pinching" methods of pottery molding, and using a pit instead of a kiln for firing. However, villagers are beginning to realize the advantage of mass production for ceramics. They have requested assistance in constructing kilns. Fuel is a problem.

698-0407.21 - SEAWEED FARMING - The beneficiaries are coastal Tanzanians who until now have not had any organized approach to seaweed farming. They all tend to be very poor, unsophisticated and fluent only in Kiswahili.

698-0407.22 - PHOTOVOLTAIC ENERGY - As conceived, the solar energy alternatives would have been suitable because it would have allowed for energy independence at the rural sites. Because of the extreme difficulty and unreliability associated with fuel supply, the solar technology was to have freed the recipients fron uncertainty.

698-0407.32 - RUVUMA FISH FARMING - The villages are comprised of farmers engaged primarily in subsistence farming (agriculture). Schools, groups (such as women's organizations and cooperatives), and private individuals are anxious to improve their diets and supplement their incomes.

Q6. WHAT ADOPTION RATE HAS THIS PROJECT OR PREVIOUS PROJECT ACHIEVED IN TRANSFERING THE PROPOSED TECHNOLOGY?

69-0407.05 - HANDMADE PAPER - The technology has had a 100% adoption rate.

698-0407.11 - TRADITIONAL POTTERY - The technology brought in under this project - machinery - is fully utilized by the proposer.

68-0407.21 - SEAWEED FARMING - It is still too early to tell because the PACD at time of evaluation was several months away. Also a pilot crop has only just been started and adoption will depend on the outcome of harvest. It is hoped that a pilot crop will greatly increase the technology adoption rate, although to date the target groups have been receptive.

698-0407 - PHOTOVOLTAIC ENERGY - Technology was not adopted due to lack of project implementation.

698-0407.32 - RUVUMA FISH FARMING - Due to slow implementation, it is still too early to judge the technology adoption rate, although the project is succeeding in reaching envisaged beneficiaries. The Peace Corps Volunteers have almost more clients than they can adequately service.

Q7: WILL THE PROJECT SET IN MOTION FORCES THAT WILL INDUCE FURTHER EXPLORATION OF THE CONSTRAINT AND IMPROVEMENTS TO THE TECHNOLOGICAL PACKAGE PROPOSED TO OVERCOME IT?

698-0407.05 - HANDMADE PAPER - Yes. The paper mill is actively seeking out information on paper production from other African countries. The Tanzania staff is constantly researching way to produce new and better quality products with various methods and materials.

698-0407.11 - IMPROVEMENT OF TRADITIONAL POTTERY - The project proposer is a remarkably innovative entrepreneur. He is constantly improving his technology in order to increase efficiency and profit.

68-0407.21 - SEAWEED FARMING - The implementing agent and co-sponsor of this activity has been very conscientious in reporting on the project development. It is his hope that communication on this project, once successful, will stimulate interest along the coast.

698-0407.22 - PHOTOVOLTAIC ENERGY - The University of Dar es Salaam is planning to try to locate alternative donor support for this activity.

698-0407.32 - RUVUMA FISH FARMING - The medium term success of this project hinges on the timely replacement of Peace Corps volunteers for the originally planned four Volunteers. It is doubtful that th e Tanzania Fisheries officials alone will keep abreast at the state of art of fish farming technology.

Q8: DO PRIVATE INPUT SUPPLIERS HAVE AN INCENTIVE TO EXAMINE THE CONSTRAINT ADDRESSED BY THE PROJECT AND COME UP WITH SOLUTIONS?

For all five project activities, the answer is categorically "NO". The Government of Tanzania does not actively approve of private input suppliers and discourages private enterprise activitiy when it can be replaced by government controlled operations for distribution of inputs. Noetheless, two projects, Handmade Paper and Traditional Pottery, have succeeded primarily due to the strong personalities of the proposers.

Q9: WHAT DELIVERY SYSTEM DOES THE PROJECT EMPLOY TO TRANSFER THE NEW TECHNOLOGY TO INTENDED BENEFICIARIES?

698-0407.05 - HANDMADE PAPER - All staff members of Nyumba ya Sanaa are required to train in the handmade paper mill. The paper mill is self-sufficient.

698-0407.11 - TRADITIONAL POTTERY - The pottery site in Arusha offers training free of charge to Tanzanians - they need only pay their own room and board. The training is normally 6-8 weeks on-the-job training doing all aspects of pottery production. In addition, the proposer provides free technical assistance/consulting to interested parties.

698-0407.21 - SEAWEED FARMING - Three Seaweed farm managers have been trained and will train others in this methodology through the use of demonstration plots, manuals and practical application. In addition, Profesor Mshigeni of the Unimversity of Dar es Salram will do related research and extension work.

698-0407.22 - PHOTOVOLTAIC ENERGY - There was to be no delivery of the proposed technbology to the intended beneficiaries. This was to be a pilot activity under the supervision of the Department of Electrical Engineering, University of Dar es Salaam.

698-0407.32 - RUVUMA FISH FARMING - The project has used Peace Corps Volunteers and local Fisheries Extension personnel to deliver the technology.

Q10: WHAT TRAINING TECHNIQUES DOES THE PROJECT USE TO DEVELOP THE DELIVERY SYSTEM?

698-0407.05 - HANDMADE PAPER - Training on site.

698-0407.11 - TRADITIONAL POTTERY - On-the-job training.

698-0407.21 - SEAWEED FARMING - Repetitive application of technology at project sites. Seaweed farming manual will augment this approach.

698-0407.22 - PHOTOVOLTAIC ENERGY - Not applicable.

698-0407.32 - RUVUMA FISH FARMING - Posters in Swahili as well as a manual showing techniques have been used. On-site training sessions by PCVs and extension work have constituted training.

AFR/EA/JJohnson:rsbe:6/28/83