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**MID-TERM REVIEW
OF THE MOZAMBIQUE
PROSTHETICS PROJECT**

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I. INTRODUCTION

For a three week period in mid-February and early March a four person AID/Washington Office of Health financed team conducted a mid-term external evaluation of the Mozambique Prosthetics project. The project was first approved in 1989 and amended and extended in 1990. The original \$2,530,000 project had five components: 1) to secure a better estimate of the numbers of amputees and from that a better definition of need and appropriate rehabilitation policy and strategy. 2) to increase the production and availability of prosthetics and orthotics, 3) to improve the overall standards of orthopedic surgery, including a better surgical follow-up and prosthesis maintenance program, 4) to increase the numbers of trained prosthetist/orthotists, physical therapists and orthopedic surgeons, and 5) to provide better access for rural people to prosthetic care through the construction of transit centers near the hospitals where clients could stay while being treated.

A 1990 project amendment provided an additional \$1,000,000. These resources funded the additional costs of constructing more permanent transit center facilities, added costs for training basic level orthoprosthesis technicians, and funded a small grant to ADEMO, a Mozambican NGO, for small vocational training and economic development projects. The amendment also added a sixth project component "to actively engage disabled Mozambicans in productive economic activities through food production at the hostels and small income-generating activities in two or three other sites."

The team included Bernard Chapnick, an AID project design and evaluation specialist, Robert Lebow, a physician with wide developing country experience, Mike Quigley, a practicing prosthetist/orthotist and John Aiden, who served as the team leader. Both Quigley and Aiden had served on the 1989 design

team that developed the original project. Quigley and Chapnick came to Mozambique directly from Uganda where they evaluated the prosthetics assistance project there and thus had a good frame of reference with which to compare the relative progress of the two country activities.

The evaluation team was accompanied in the field by Dr. Moussa Calu, a Mozambican physician who serves as the technical project coordinator for USAID and liaison between USAID, the Ministry of Health and the four NGOs involved in project implementation. As the former director of physical rehabilitation for the Ministry of Health his insights, experience and contacts proved invaluable. The team was also accompanied in the field by Norbert Nicoud, Mozambique Director of Handicap International and Peter Poetsma, Coordinator of the ICRC's orthopedic programs. Each guided us through the project components he is implementing.

In Maputo the team met with the senior Mozambicans responsible for rehabilitation in the Ministry of Health and the Secretariat for Social Action and all of the organizations implementing the project. The Team visited the ICRC workshop, the HI sponsored training courses and the orthopedic and rehabilitation facilities in the Maputo Central Hospital - including those developed with the assistance of HVO. The team met with the director and staff of ADEMO as well as the SCF staff and the architects designing the transit centers.

Outside Maputo the team examined on the ground Handicap International's activities in Inhambane and Nampula, ICRC's programs in Beira and Quelimane and ADEMO's affiliates in Beira and Nampula. In Quelimane we interviewed some of the surgical assistants who had participated in the HVO sponsored in-service training course. In Beira we also visited the national school for the blind. In Nampula we visited the orthopedic rehabilitation facilities. In Inhambane, Beira, Quelimane and

Nampula we visited the transit center sites and in the latter three places discussed with the local officials the issues that surrounded the delays in construction.

In composite the program of interviews and field visits gave the team a brief but relatively comprehensive view of the situation. We are grateful for the generosity with which people shared their time with us and the candor with which they discussed the issues.

Overall, the team came away with the impression that the project was making a very positive contribution to meeting the needs of the amputees and the needs of some of the other physically disabled in Mozambique. AID/Washington and USAID/Mozambique should feel pride in its association with this effort. Almost all of the most important project components are doing very well and are already exceeding our expectations both qualitatively and quantitatively. The one exception is the transit center component which is well behind schedule and needs more attention. Delays in transit center construction are already becoming a serious program constraint. The planning component is also delayed but this delay is not threatening implementation of other parts of the project. In the case of ADEMO it is not clear whether the small amounts of grant funds used to date have been used to support activities approved in the amended project paper.

In addition to examining the progress to date against the end of project goals defined in the project paper we have also considered the issue of sustainability. While AID's prosthetic activities were never contemplated as sustainable and/or institution building it seems clear that the need for help will continue beyond the scope of the present project and some donors are already developing phase-out plans. AID and others need to consider the longer term and how these needs will be met.

The report is presented in three parts:

- a review of progress toward the end of project objectives as defined in the project approval documents
- a discussion of the longer term needs and the issues of sustainability, and
- our findings and recommendations.

The evaluation team was impressed with the number of dedicated and resourceful people - both expatriates and Mozambicans - that are working successfully to meet the critical needs of the mobility-disabled - often under extremely adverse conditions. It is their technical and management skills and sense of social responsibility that are translating the financial contributions by AID and other donors into the overall positive project results that the evaluation is pleased to report.

II. PROGRESS TOWARD ACHIEVEMENT OF PROJECT OUTPUTS

A. Progress Toward Outputs One: An Accurate Assessment of Emergency Related Physical Rehabilitation Needs That Will Serve as a Basis for Planning. Development of A National Physical Rehabilitation Plan.

At the time the prosthetics project was developed two and a half years ago one of the weakest elements in the design was a definition of need. In the absence of any other data, USAID consultants had estimated that given a total population of an estimated 15 million the numbers of amputees in Mozambique should be approximately 15,000. The USAID consultants further estimated that about 80 percent of these amputees were war-related. The estimate of the total number of amputees in Mozambique was probably derived from a WHO formula which estimates that 10 percent of any population is handicapped and 10 percent of the handicapped are amputees.

At that time the on the ground staffs of ICRC and Handicap International speculated that the number of amputees was half that amount - a total of 7,500 cases with 1500 new cases each year.

Because of the wide discrepancies in estimates and the obvious need to gear training and services to a best estimate of need the project provided funding for a modest needs assessment. This was to be carried out during the first six months of the project by an AID funded consultant.

Early in the project it was decided that the study could be more effectively carried out internally with the efforts of the AID funded field coordinator and the other locally based implementing agencies who understood the gaps and discrepancies in the existing data. In the revised

project paper USAID set a new target date of January, 1991 for completion of the study.

A small national survey of health facilities where surgery is performed has been recently completed. These data have now been collected - except for two provinces - and an expatriate resident consultant has been identified to tabulate and analyze the results. This information should give us insights into the total numbers of amputees treated at health facilities, their age, gender and occupation, the cause of the incident and the trends in demand.

The obvious limitation to this study is that internal security precludes assessing the situation it does in areas not now controlled by the central government.

Another approach that should also give some insight into trends in current demand is to analyze the backlog of new patients seeking services at the two providers, ICRC and Handicap International.

Current "informed speculation" suggests that the total number of amputees is now estimated at 7,000, with the number of new cases estimated at 1,000 per year. Some informed observers say that at least in Maputo the total numbers of amputations has leveled off. War related amputations have declined but these declines have been replaced by victims of serious traffic accidents.

The follow-on National Rehabilitation Plan that was contemplated in the project design to be prepared from the survey data has not been developed. We were informed that a narrative document which set out broad program objectives without numbers has been prepared at the Ministry of Health without AID or other donor assistance. We did not review this document.

B. Progress Toward Output Two: To Increase the Number of Prostheses That Are Manufactured, Fitted, and In Use

The project began with an uncertainty about the demand for prostheses. That uncertainty continues to the present, as discussed in the Assessment section. The "informed speculation" of the professionals in Mozambique places the number of amputees at 7,000, with 1,000 new cases per year. That number is dependent upon the extent and duration of hostilities, the number of returning refugees who will need prosthetic services (both internal and external refugee totals are estimated at 2-3 million), and the extent to which anti-personnel mines left behind in farmers' fields will continue to produce casualties long after the end of hostilities. The revised Project Paper has a target of 1,300 new prostheses fitted in 1992, which appears to be attainable following a combined production level of 1,098 in 1991. The graduation of the newly trained prosthetists in 1993 should result in greatly increased production capability.

Two very capable NGOs are providing prosthetic and orthotic services; the International Committee of the Red Cross (ICRC) and Handicapped International (HI). Both ICRC and HI have a good reputation throughout the world for providing emergency services, although each operates on a different philosophy. ICRC uses mass production techniques and fits European style plastic, wood and metal prostheses with good cosmetics. HI produces a hand-made, functional and durable prosthesis that has little cosmetic value but can be fabricated and repaired without the need for sophisticated supplies or equipment. Both ICRC and HI provide a much needed service to Mozambique.

1. THE ICRC PROGRAM

The ICRC prosthetics program is headquartered in the central hospital in Maputo, and is directed by Peter Poetsma. ICRC has been in Mozambique since 1979. The ICRC project has three major activities:

- (1) manufacture of artificial knees, feet and orthotic components;
- (2) clinical services in a number of cities; and
- (3) training programs in prosthetics and orthotics.

a) Component Manufacture

Artificial knees of the Debre-Zeit design (used in many developing countries) are manufactured using wood duplicating lathes and metal working machines. SACH feet are also manufactured, using a polyethylene Aveolux foam. These components are made at the Maputo workshop and then shipped to the other ICRC workshops. Designs for pre-fabricated orthotic knee ankle joints are presently being developed. The project purchased a number of pieces of equipment used in component manufacture.

b) Clinical Services

Prosthetic fittings (ICRC does not provide orthotic services yet) are done in the following cities: Maputo, Beira, Quelimane and Nampula. Each location is staffed with at least one technician, branch worker secretary, driver and auxiliary employee. The Maputo workshop, which does the mass production of components for all the workshops, has 47 employees. The majority of the staff are paid by the Mozambican Health Ministry and are given supplementary food basket bonuses by ICRC.

ICRC fit 989 prostheses in 1991 in all four centers of which about half were replacement limbs. ICRC fits pylon preparatory prostheses on new amputees for use while their residual limb atrophies, and exoskeletal definitive prostheses later. The Maputo workshop produced during this period 3200 elbow crutches.

A major improvement in prosthetic design is the use of brown polypropylene thermoplastics to provide strength and cosmetic appearance to the prostheses. Polypropylene replaces polyester resins which had to be laminated. Polypropylene is imported from a factory in South Africa and is much easier to use than laminates which:

- (1) need to be imported from a great distance;
- (2) have a short shelf life in tropical areas;
- (3) have a high incidence of allergies;
- (4) are considered a carcinogenic risk; and
- (5) require a technically difficult lamination procedure.

The shank section of above knee prostheses at the ICRC/Maputo workshop consist of a metal pylon covered with aveolux polyethylene foam. Below knee prostheses use a hard socket with patella, tendon supracondylar (PTS) suspension, SACH foot and exoskeletal construction of polypropylene over wood. Alignment is generally made with the time consuming "cut, wedge and glue" method, but a better method using four vertical hose clamps on the anterior, medial, posterior and lateral sides of the leg is also used. By tightening down the hose clamps on one side and (or loosening them on the opposite side) an alignment change is made. Students are being taught both methods.

Production of upper limb prostheses has recently begun, at the request of the Ministry of Health. Hands

with wire fingers are covered with brown aveolux foam and painted, resulting in a lightweight cosmetic hand. A manually locking elbow has been copied from a German design.

A total of 460 new amputees were seen by ICRC in 1991, (317 of them non-military, and of this civilian group, 75% were anti-personnel mine injuries).

c) ICRC Training Programs

[NOTE: see the overall discussion in the Training section]

With the urging and assistance of USAID, ICRC established a prosthetics and orthotics training program in Beira. The program is intended to graduate medium level (11th form) technicians.

With USAID support, a small classroom building on the Central Hospital grounds in Beira was refurbished and given a new roof and a wing was added to the workshop building. Workbenches, 4 routers, sanders, vacuums, a dust collector and an oven were purchased. A set of hand tools were purchased for each student.

Miguel and Allesandre Fernandes, Portuguese couple who were serving as prosthetists in Angola, were brought to Beira and spent 6 months organizing the curriculum, translating texts and writing new texts.

Forty 9th form students were recruited, 3 from each province, plus 5 Angolans. Presently the Angolans have dropped out and some other students could not keep up. Twenty-four students are now in the 5th semester. The course lasts 3-1/2 years or 7 semesters. There is no plan to begin a second class. Upon graduation, students will be given jobs by the Ministry of Health and a salary of about

100,000 Meticaís a month (about \$50), which is double the minimum wage.

In addition to instruction in prosthetics, an orthotics course is also conducted for the same group by an instructor from Portugal with 30 years teaching experience. An additional instructor from Nicaragua is also employed by the program.

The overall prosthetics/orthotics course is an excellent one, using translations of New York University text books, covering all of the fundamentals of biomechanics and anatomy and having a very good 6 to 1 student to teacher ratio. Graduation is planned for March or April 1993, when a three week examination will be given with written, oral and practical sections. Outside examiners (including Mike Quigley from the design/review team) will be brought in during the last week to add objectivity and credibility to the examination process. The certificate/diploma to be awarded to graduates is in the process of becoming internationally recognized.

2. THE HANDICAPPED INTERNATIONAL (HI) PROGRAM

The Grant provided to HI was for essentially the same services as ICRC provides although HI approaches the problem differently. HI has the philosophy of low technology, low cost and, to the extent possible, locally available, indigenous materials.

a) Component Manufacture

HI does not mass produce artificial feet and knees, as it would make their prosthetists dependent upon a supply of components. Prosthetists make each foot and knee individually for every patient.

b) Clinical Services

H.I.'s technical focus is on providing low-cost, low technology sustainable services. Their workshops are located in Inhambane, Vilanculos, Nampula and Tete. An additional workshop is being planned in Lichinga.

Every attempt is made to keep the workshop completely independent requiring little imported equipment and supplies. Workshops in Vilanculos, Inhambane, and Tete do both orthotics and prosthetics including wheelchairs and crutches. The Nampula Center does not make prosthetics since there is an ICRC prosthetics workshop in Nampula.

Prosthetics technology includes the use of a wooden foot with a sole of laminated belting material (an old tire) and double uprights of aluminum extending to a leather molded socket with a metal frame. The socket is made from thick molding leather soaked and wrapped around a positive model until dry. Supracondylar suspension is often used. The positive model is made either from wax or wood. The shape of the model is determined from circumferential anterior-posterior, medio-lateral measurements and molded lead strip patterns. The HI prosthesis needs replacement every 2-3 years, which is the same as the ICRC design.

The prostheses are lightweight, cool, durable and easy to repair. However, they are not cosmetic and each one takes a long time to fabricate using hand tools. In 1991, only 109 permanent prostheses were made by HI and 75 orthoses. In addition, 119 wheelchairs and 1,916 pairs of crutches were provided.

Follow-up service and repairs are made when the patient is no longer capable of repairing the prosthesis himself but no "call up" schedule is possible.

c) The HI Training Program

[NOTE: see the overall discussion in the Training section]

A training program is presently being conducted by HI at the industrial school in Maputo. 29 students from the different provinces are enrolled in the physical therapy course and 19 in the prosthetics course. Current plans (and funds) are for a one-time course.

A French prosthetist has been brought into teach the course along with a Mozambican counterpart. The students will graduate at the 9th form level and will be considered lower level technicians. Graduation is scheduled in 1994.

After considerable negotiation the Mozambique Government has agreed that graduates will be hired by the Ministry of Health and will be placed as needed.

3. THE FUTURE OF THE PROSTHETICS PROGRAM

Both ICRC and HI are disaster relief organizations. ICRC in particular pulls out of countries as soon as the crisis ends and the local authorities (or other donors) show that they can maintain control of the system.

ICRC presently has plans to pull out of Mozambique in 1995, 1-1/2 years following the end of the training program. A plan for an orderly transition of management has been given to the Ministry of Health by ICRC, but no response has been received. ICRC will probably leave at least one expatriate in Mozambique after 1995 to continue

providing some support. [NOTE: all plans are based on the assumption of a great reduction or cessation of armed hostilities. Continued or increased levels of hostilities would call for a new judgment about the need for and usefulness of continued assistance].

HI has no current plans to decrease its presence in Mozambique and is still planning expansion into Lichinga. HI's activities have also broadened to provide some vocational rehabilitation to its patients. One example of this is to loan money to start "microbusinesses". Examples given were to loan money for the purchase of a donkey so a patient could start a small transport business (result: loan paid back early). Another example was a loan to buy and stock a pushcart. HI has assisted ADEMO to help them in their vocational rehabilitation and other socialization projects.

The project's original goal of fitting 1,300 prostheses/year looks attainable, but orthotics is another story altogether. Providing orthotic services to all of Mozambique's disabled is a hopeless task. The vast majority of disabled have long-standing contractures and deformities making them unbraceable without corrective surgery. But corrective surgery is not possible for over 90% of the disabled because of the lack of surgeons. Most people requiring any medical care (including surgeries) go to paramedic technicians who only perform life-saving or routine surgeries, such as appendectomies and cesarian sections.

The only possible way to start an effective orthotic treatment program is to start educating therapists, physicians and all other health workers to refer a patient for bracing as soon as a neuromuscular problem is noticed, before deformities begin.

Most of Mozambique's disability problems could be prevented with good primary health care. Polio vaccine, measles vaccine, penicillin, antibiotics and sanitary wound care are all lacking in much of the country. Even in the current security situation much more could be done.

C. Progress Toward Output Three: Measurable Improvements in the Quality of Orthopedic Clinical Case Management

Health Volunteers Overseas (HVO) is responsible under the project for the improvement of the quality of orthopedic case management. The project rationale for improving the quality of clinical care in this prosthetics program was based on the assumption that more carefully performed amputations and follow-up care of the surgical stump would result in more effective prostheses as well as improved overall orthopedic and surgical care for war and accident victims. In certain circumstances, improved clinical care and follow-up could also mean decreased disability or even avoidance of amputation. The HVO program included:

- (1) Provision of a medical director to manage the HVO program and participate directly in improving the quality of care. A principal duty was to organize and supervise an orthopedic residency program for the Maputo Central Hospital;
- (2) Short-term technical assistance;
- (3) Provision of orthopedic equipment and materials, and arranging for the production of some basic orthopedic materials within Mozambique;
- (4) Improving the teaching program for medical students doing their rotation in orthopedics, including the provision of teaching materials for the students;
- (5) Training or re-training of mid-level surgical technicians in orthopedics, and the training of other mid-level personnel;

- (6) Improvement of facilities for teaching and clinical work in orthopedics at the Maputo Central Hospital;
- (7) In association with the physical therapy, rehabilitation and prosthetics departments, coordination of surgical programs with these other disciplines; and
- (8) Facilitating continuing education and scientific programs outside of Mozambique for the country's only Mozambican orthopedist.

In-country administrative support for HVO has been very effectively provided by Save the Children (U.S.) with funding from the project.

1. THE MEDICAL DIRECTOR

Dr. Richard Fisher, a Colorado orthopedist recruited by HVO, came to Mozambique in June 1990. He expected to stay for 3 years. Although his overall goal was to promote the quality of care in orthopedics, his first priority -- and his work plan showed 40% of his time being devoted to this specific task -- was the development of an orthopedic residency program at the Maputo Central Hospital.

Although he worked for a short while with some physicians interested in becoming orthopedic residents, the residency program that was to start with 2 residents in January 1991 never materialized. Three physicians who were to become orthopedic residencies all left Mozambique to do training in orthopedics outside of the country. This was apparently arranged by the Ministry of Defense and no other candidates for the residency program were identified by the Ministry of Health (MOH). At present, the MOH does not

consider a residency program in orthopedics to be a high priority. Largely because the residency program failed to materialize, Dr. Fisher terminated his long-term work as Medical Director of the HVO program in Mozambique in December 1991, after being in the country for 18 months. At about the same time, HVO hired Elizabeth Downes, an American nurse practitioner who was already living in Mozambique, to take over as coordinator of the HVO program. A new work plan which concentrated more on the training of mid-level personnel, as opposed to physicians, was also drawn up and accepted by USAID.

Despite the inability to establish an orthopedics residency program in Mozambique, Dr. Fisher's work was extensive and very much appreciated by all the people with whom he worked. He did much to advance the quality of care in orthopedics in Mozambique. He worked closely with the country's only Mozambican orthopedic surgeon, Dr. Jose Langa. To improve Dr. Langa's skills, Dr. Fisher even participated in Dr. Langa's certification process as an orthopedic surgeon. Dr. Fisher performed many orthopedic surgery interventions at the Maputo Central Hospital, and provided leadership and training for the other (expatriate) orthopedic surgeons as well as the hospital's physical therapy and rehabilitation staffs. He helped organize and participate in regular teaching conferences and ward rounds on the orthopedic service. The teaching conferences and ward rounds are continuing and serve as a vehicle for both coordination and team case management. Dr. Fisher was instrumental in initiating and/or carrying out all the other HVO-related activities listed below as well.

2. SHORT-TERM TECHNICAL ASSISTANCE

HVO was to provide up to 22 person-months of short-term technical assistance during the life of the

project, but, so far (20 months into the project) only 3 person-months have been provided: Dr. Malcolm B. Madenwald, an orthopedic surgeon from Washington State, came in March 1991. He felt that his experience was not particularly useful, apparently largely because there were no orthopedic residents. On the other hand, Drs. Charles M. Abernathy and Reg. Franciose, who came to Mozambique in Sept.-Oct. 1991, found their experience to be extremely useful, as did the surgeons in Mozambique. Drs. Abernathy and Franciose did a great deal of teaching of new techniques in Maputo as well as "up country." They presented a workshop in vascular anastomosis with the orthopedic and general surgeons of the Maputo Hospital. Their teaching was considered invaluable by the surgeons who were caring for patients with severe traumatic injuries.

HVO is presently recruiting a volunteer physical therapist to teach physical therapy for 6 months. HVO may be able to place a Brazilian orthopedic surgeon as a short-time person. HVO is also trying to recruit a Portuguese-speaking surgical "scrub nurse" instrumentista to help for at least 6 months with a MOH planned long-term course for surgical "scrub nurses," who form an integral part of any surgical team, and who are in very short supply in Mozambique.

There is no doubt that short-term T.A. can be very effective, either in Maputo or at the provincial level, and the team encourages HVO to continue the search for physician-level and mid-level trainers. The major limitation is language capability. Any short-term person would be much more effective with basic Portuguese, Spanish or Italian.

3. PROVISION OF ORTHOPEDIC EQUIPMENT AND MATERIALS

HVO's budget included \$205,000 for orthopedic supplies and equipment, including operating room equipment (\$125,000), medical supplies (\$55,000), and training materials (\$35,500). Although some priorities may have changed since the project began, only \$48,000 of project funds have been spent (with \$157,000 remaining), as of the end of February 1992. However, more than \$80,000 worth of materials and supplies have been provided, much with donations. These materials included library books, desks, chairs, a TV monitor and VCR along with a variety of orthopedic tapes, as well as surgical tools and materials. Some surgical materials have already been distributed to surgical technicians who took a orthopedic course in June 1991, but other surgical materials have been acquired and have been transported up country.

\$28,000 has been committed to plumbing improvements in the orthopedic wards of Maputo Central Hospital; these are sorely needed -- intolerable conditions as a result of faulty plumbing were observed by the team. Renovation of an area dedicated to debridement has also been included. The present orthopedic surgeons would like the project to fund the building of two new operating theatres in the orthopedic ward area, but even Dr. Fisher is doubtful that they could be effectively used at this time, as the major limitation in doing surgery is the lack of personnel to do anesthesia. Further analysis would be needed if this request were to be seriously considered.

HVO will provide sets of orthopedic instruments, valued at \$4,000 each, to the 18 or so surgical technicians who are to come to the orthopedic (and general surgical) training course in July 1992. Apparently other needs for orthopedic instruments have already been identified; Dr.

Langa would be able to define better how the remaining funds will be spent. If there are funds remaining within the project for orthopedic instruments, these need be basic in nature and be allocated primarily to the provincial hospital level. The need for basic orthopedic instruments is great. Even in the busy casting room of the orthopedic service in Maputo, there is only one electric cast cutter, and it is broken. A high priority for Drs. Calu and Langa is to coordinate efforts to obtain needed basic tools and materials. There has been an effort, coordinated by HVO to have some basic orthopedic "hardware" (plates, screws, pins) fabricated in Mozambique. Supplies of a proper alloy have apparently been obtained, and there is a question if they can be machined adequately in Mozambique. We may find out soon if this effort will be successful. Dr. Calu had his doubts about the feasibility of this sub-project.

4. IMPROVEMENT OF THE TEACHING PROGRAM FOR MEDICAL STUDENTS

Medical students do a rotation through orthopedics, and Dr. Fisher participated in 2 rotations during his work in Mozambique. He helped to develop a 150-page orthopedics outline for the students which can now be used as a standard in their training - in addition to their lecture notes. HVO has also purchased a Portuguese-version of Adam's Manual of Orthopedics in paper back for every student, and plans to buy enough of this volume to supply each class for the next 5 years with this book so that they all have a ready reference in Portuguese for basic orthopedic procedures when they go out to work in the field.

5) TRAINING MID-LEVEL SURGICAL TECHNICIANS AND OTHER MID-LEVEL PERSONNEL

A 4-day course in basic orthopedic techniques and rehabilitation for surgical technicians was supported by

HVO and conducted by Drs. Fisher, Langa, and Calu in June 1991 in Quelimane. There are about 120 mid-level medical technicians in Mozambique (about the technical equivalent of the U.S. Physicians Assistant), and in 1986, about 20 of them completed 18 months of extra training to become surgical technicians. These people are now doing emergency surgery at up-country hospitals, but they had had no follow-up training since their graduation in 1986.

Thus, this 4-day course was arranged and conducted in Quelimane. It was attended by 5 of the surgical technicians, one physical therapist and 3 general physicians. The team interviewed 3 of the technicians and the physical therapist who took the course. Except for one of the technicians, a Guinean expatriate under contract with the Mozambican government, who thought the course was too basic for him, they all felt that the course had been useful and instructive. They also felt it had been too short, and they expressed the desire for more of the same on an ongoing basis. This kind of need could partially be filled by short-term experts if HVO were able to find experts qualified and willing to participate. The technicians would have liked instruction in areas other than orthopedics as well. The instruction was highly practical, involved having two actual surgical procedures going at once, with active participation by the technicians. An evaluation of the course was conducted in August 1991 but a 2-day follow-up session was never carried out for logistical reasons.

HVO is planning another course for mid-level surgical technicians. Tentative plans to hold 3 additional courses were consolidated with the result that currently a 5 to 8 day course is planned for Maputo in July 1992. The target audience for this course will be the remaining surgical technicians from all over Mozambique. The course will not

solve the problem of ongoing, regular continuing education for the surgical technicians which is a high priority requirement.

In addition to their work with surgical technicians HVO will participate in a planned course for surgery "scrub nurses," which the new HVO coordinator, Elizabeth Downes, is helping to organize. Further, on 1/26/92 Ms. Downes began coordinating a 2-hour bi-weekly course for the approximately 40 ward nurses on the orthopedics floors of Maputo Central Hospital to upgrade a variety of skills.

It is notable that, with the failures of the residency program to materialize HVO's emphasis has shifted from physician training mid-level training, probably a more practical approach for Mozambique in the immediate future. It is planned to select and train one basic level orthopedic technician as well from the Maputo Hospital. The head of nursing services will make the selection. Dr. Langa will approve.

6. ORTHOPEDIC FACILITIES AT THE CENTRAL HOSPITAL

As noted above, HVO established an orthopedic library. Dr. Fisher also arranged for the remodeling and equipping of an orthopedic conference room next to the library. This conference room was completed in mid 1991 and has been actively used on a daily basis to have physicians conferences, presentations, and other meetings.

The project is also about to finance as mentioned above, plumbing repairs and the renovation/equipping of a debridement room for the orthopedic floors at a cost of \$28,000. Some additional work involving external sinks and wash basins (for about \$4,000) has also been proposed. HVO has also been involved in a variety of small projects to

improve the functioning of the orthopedic service:
standard weights for traction devices, bedboards for the
beds, upgrading the skills of the ward nurses, etc.

7. COORDINATION OF ORTHOPEDICS WITH REHABILITATION AND PROSTHETICS

As part of the effort to improve the quality of care, the project was to promote better coordination of efforts between orthopedic surgeons or surgical technicians and physical therapy/rehabilitative medicine/prosthetics. This coordination has in fact rarely happened before surgery when emergency surgery for trauma was/is involved. Given the scarcity of human resources, pre-surgery consultation among the different entities is just not practicable -- even less so outside of Maputo. However, at least for elective surgery, and at least while Dr. Fisher and Dr. Calu were still working at the Maputo Hospital, this kind of interdisciplinary consultation was in fact taking place each Thursday morning when Drs. Fisher, Calu, and Langa would get together to discuss cases. Since Dr. Fisher left and Dr. Calu moved to USAID in December 1991, these conferences have not taken place but weekly pre-surgical conferences -- for the next week's elective cases -- have continued on Friday afternoon. We inquired about these kind of consultations at the provincial level; they occurred only if there were close personal relations among the partners involved and were certainly the exception. Given scarce human resources on all levels as well as the immediate nature of trauma surgery, it is unrealistic to expect pre-surgery consultations between disciplines to become a standard in Mozambique.

8. TRAINING ABROAD

HVO financed Dr. Langa's attendance at a conference in Malawi in Dec. 1991, when along with Dr. Fisher, he

presented a scientific paper. HVO also arranged a two week orthopedic course for Dr. Langa in Washington D.C., in February 1992. No other international training is planned at present.

a) Quality of Care Issues in Prosthetics/Orthotics

Project outputs include some quality of care issues with regard to prosthetics and orthotics as well as with orthopedic clinical case management. The goals of establishing effective clinical follow-up programs and a "client responsive" prosthesis maintenance program have only been minimally reached so far in this project and it is unlikely that either of these goals will be reached. Reality is that transportation to the districts, where most of the amputees live, is extremely difficult and hazardous at present. Air travel is the only safe way to travel for most of the country, either for follow-up or supervision. Handicapped International does make some effort to instruct their prosthetics patients in some basic ways to do self-repairs. People who need more extensive repairs to their prostheses need to come in on an emergency basis whenever they can get safe transportation. There also has been some minimal effort to extend some prosthetics services to some district towns that are now safe.

D. Progress Toward Output Four: Training Courses Developed and Conducted in Components of Physical Rehabilitation and Prosthesis Production

Because of Mozambique's extreme shortage of trained health personnel, the project has had training as one of its main foci. The project has supported three long-term training courses for three different levels of physical rehabilitation and prosthetics. These are:

- (1) A mid-level 3-1/2 year course run by ICRC at Beira for prosthetists/orthotists.
- (2) A basic level 2-1/2 year course run by HI at the Health Sciences Institute in Maputo for prosthetists/orthotists.
- (3) A mid-level 3-1/2 year course run by HI also at the Health Sciences Institute for physical therapists.

There are no current plans for long-term training of new surgical technicians or anesthetists, but the need is recognized.

1. THE MOH/ICRC TRAINING COURSE FOR MID-LEVEL PROSTHETISTS/ORTHOTISTS

With a \$75,000 grant from the project, as well as financing from other sources, the ICRC began a course in Beira in January 1990 for 38 students, including 7 Angolans, to train mid-level prosthetists/orthotists. Entering students had to have completed their 9th level training. The course runs 3-1/2 years, has just completed its fourth semester in December 1991, and is scheduled to be completed in July 1993. There are currently (Feb. 1992) 24 students still enrolled in the course (the Angolans have all dropped out, the team was told, because they were

unable to keep up). In order to comply with the Mozambican educational system, the course (like the other courses below) has had to include about half the time doing basic courses not related to the practical prosthetics/orthotics studies to meet the requirement that the graduates meet Mozambican 11th level standards. While assuring that the students enter the MOH payscale at a certain level, the extra basic courses mean prolonged training time (double the time) for all the courses. While this requirement gives the graduate better job security when they graduate, it postpones their entry into a market which sorely needs them and it also makes it easier for them to leave the country for a higher paying job elsewhere.

The 24 current students are now actively learning ICRC's methods for making prosthetics, and they also will receive some brief training in HI's more basic techniques. The orthotics training is now beginning. The ICRC training shop in Beira, which the team visited and observed the students in training, is well-equipped, well-stocked, and efficiently run by Miguel Fernandes, a Portuguese prosthetist/orthotist. The practical training looks to be of excellent quality. If at least 20 of these students graduate in 1993, the project targets will be achieved.

2. TRAINING FOR BASIC LEVEL PROSTHETISTS/ORTHOTISTS

HI, under the direction of Xavier Lemire, initiated a 2-1/2 year basic level course for prosthetists/orthotists on April 8, 1991. (This is a new category of personnel for the MOH.) This course is supported by \$125,000 in project funds from the August 30, 1990 Project Amendment. As discussed above, half of the course curriculum is basic studies so that the entering 7th level students can graduate with a 9th level standard education and is

eligible to enter the civil service at that level. The course is scheduled to be completed in December 1993.

20 students started the course, and, after the first semester, 19 remain. There have been problems in obtaining adequate instructors, especially physicians and medical students, as the pay for instructors has been only about 1,200 meticals an hour, (about 40.60 cents) so the course coordinator M. Lemire of HI has spent much time trying to arrange instruction. The course is using a facility at the Industrial Institute in Maputo for its practical training in prosthetics/orthotics.

If at least 15 of these students graduate, the project target in training basic level prosthetists/orthotists will be met.

3) TRAINING FOR MID-LEVEL PHYSICAL THERAPISTS

With the help of \$150,000 from the project, HI is coordinating a 3-1/2 year course based at the Health Sciences Institute in Maputo for the training of mid-level physical therapists. The students all entered with 9th level training, and the course (as with the other courses above) is devoting half its curriculum to basic subjects such as Mathematics, Portuguese, and English so that they may graduate at the 11th level and join the civil service at that level. HI's Xavier Lemire is also coordinating this course, which is scheduled to finish in December 1994. After one semester 29 of the 30 entering students remain in the course. Of these 4 will take a track for speech therapists while 25 are to continue physical therapy. If 23 of these students complete the course, the project objective of increasing the number of mid-level physical therapists from 27 to 50 will have been met (assuming the present 27 remain active). The students were

recruited -- as well the students in the course in basic prosthetics/orthotics -- by a selection process in all the provinces through a national exam in February 1991. It is planned that most of them will be assigned to work in the provinces when they complete their Maputo training, but until they graduate, it will be impossible to say that the end-of-project objective to place 80% of the newly trained technicians in the rural area will be met.

4. SOME GENERAL CONSIDERATIONS ON TRAINING COURSES

HI's experience with a training course for physical therapists, which was carried out at Inhambane recently, was positive. HI did this course on a basic level and trained 11 people, all of whom are finally both (a) hired by the MOH, and (b) working in rural areas (if we can consider the provincial hospital at Inhambane as also being rural).

The question of whether ICRCs methodology of prostheses or HI's more basic methodology is more appropriate for Mozambique is an issue in training as well. Sustainability is the key issue. ICRC's methodology has proven to be an effective emergency measure -- they produced 989 prostheses in 1991 -- but without donor support, it's unlikely the MOH could continue to support such a technologically advanced program. Of course, for the next several years, it's unlikely that Mozambique's health system will be able to do without continued substantial donor support anyway. HI's simpler methodology has a greater chance for sustainability in the longer run, but it doesn't have the high production capacity of ICRC's method. The answer isn't simple. For the present, both technologies are probably appropriate for training.

The problems involved in placement with the MOH are substantial, but for the graduates of these course, there should be places within the MOH. It is notable that these courses are presently "one-shot" efforts without any plans for further courses in the same areas. Given the need for training in so many other health areas, this is probably realistic.

- E. Progress Toward Output Five: To provide better access for rural Mozambicans to prosthetics services through the construction of four hostels accommodating up to 120 individuals awaiting or receiving treatment. In addition, better transport will be made available.

The Transit Center component of the prosthetics project has become both more expensive and complicated than originally contemplated. As matters now stand construction is far behind schedule and it is very possible that these centers will not be completed before the current project assistance completion date (7/31/93). At the same time the need to provide temporary housing for Mozambicans while they are either awaiting or receiving treatment continues a high program priority. Without such facilities access for rural Mozambicans to treatment is severely limited. Present ad hoc arrangements for transit housing at the sites where the project contemplated construction of new facilities are unsatisfactory. In Beira patients are housed in an overcrowded tent. In Maputo the present facility is severely overcrowded and houses about twice the number of patients as was originally planned. In Quelimane there will probably be a delay in bringing new treatment facilities on line pending the availability of additional hostel facilities for the patients. The transit centers are a key project component that has thus far made little progress. The failure to complete these buildings is already threatening the progress of other program components.

1. THE ORIGINAL TRANSIT CENTER PLAN

The original plan envisioned "simple, aesthetically pleasant buildings constructed of reed and thatch". These were perceived as low cost, practical and serviceable accommodations that could be constructed quickly to meet an emergency need. The plan followed the Handicap International model which had constructed a prototype in

Inhambane. \$150,000 was set aside for four buildings to be located in Maputo, Beira, Quelimane and Nampula.

Early on it became clear that there were several problems with this concept. First, the local materials were becoming increasingly unavailable and more costly. As migrant "deslocados" have moved to town in search of better security, close in areas had become increasingly denuded of thatch and reed. Truckers were demanding more and more money to travel the longer distances necessary to finding a supply of building materials on highways that were generally unsafe. Second, Handicap International began to have second thoughts about the suitability of the building design that the project had used as the prototype. While aesthetically pleasant the transit center constructed with local materials was difficult to keep clean, presented a severe fire hazard, and the thatched roofs attracted bats and insects. As a result, Handicap International decided to reconstruct their center with cement blocks and other more durable materials. Finally, the original design ran afoul of Mozambican building codes which prohibited construction of traditional structures within the city limits. Since the transit facilities were designed to be located at secure sites near the urban orthotic/prosthetic centers (in all four provinces the treatment centers were located on the urban hospital compound) it became impractical to go ahead with traditional structures if they had to be built in less secure areas and at a considerable distance from the facilities they were designed to serve.

2. THE SHIFT TO MORE PERMANENT STRUCTURES

Following consultations with USAID and Accao Social (which had always preferred more permanent buildings that could be used for other purposes at some later date) and the availability of additional funding it was agreed that

the centers should be constructed from permanent materials. An amended project agreement was negotiated in August, 1990 that added an additional \$625,000 for transit center construction.

The transition from construction of the transit centers from local to more permanent materials obliged the project to follow US government procurement and construction regulations - a formidable new complication for the US-Mozambican implementation team. As a first step in this process the MOH was obliged to present and secure AID approval of a detailed budget and operational plan that detailed how the centers would be funded and managed when construction was completed. This plan was submitted to USAID and approved in January, 1991.

SCF - the implementing agent who had taken on this assignment at AID's request - decided to employ a subcontractor to supervise the design and manage the construction. An initial architectural proposal was prepared by Architects Sans Frontieres - a French NGO - in early 1991, following a series of site visits. The ASF proposal, while viewed as technically excellent, was felt to be far too sophisticated and costly and was rejected by both SCF and USAID. The ASF initiative resulted in a costly delay that was frustrating to all concerned.

3. CURRENT TRANSIT CENTER CONSTRUCTION STATUS

A new Mozambican architect, with experience in designing the HI replacement facility in Inhambane and a reported sound reputation as a responsible construction manager, has now been engaged.

His design of the Maputo center, (carried out with funding support from the Swiss Red Cross) is now completed

and approved by SCF, Accao Social and USAID. The land for the center has been secured. What is now at issue is a process of developing a bidding process acceptable to AID that would conform to international standards. If all goes well, and in Mozambique construction it often does not, the Maputo center would come on line in 10 months to a year - only four months before the project is to be completed. It is possible that the Beira facility could also be completed at roughly the same time since the building design is already finished provided the documentation transferring the land is executed in time.

The situation in Quelimane and Nampula is less advanced. An acceptable site for the Quelimane facility was agreed to during the evaluation team's visit and confirmed as available for this purpose by the Governor of the province at that time, but securing the documentation supporting this decision will take time. In Nampula an acceptable site on the hospital grounds is apparently available. Here the question of whether the MOH or the ACCao Sociale will be responsible for budgeting for the operating costs of these facilities seems to dominate discussions but there may also be other problems.

Even with an optimistic forecast, half of the transit centers will probably not be finished before the project is completed. While the Maputo and Beira centers can be finished in a year the centers in Quelimane and Nampula will take longer since plans have not yet been drawn and building permits have not yet been requested or approved.

The separation of Accao Sociale from the MOH has complicated the question of where responsibility lies in the government for funding the operating cost of the centers. While this issue will undoubtedly be resolved - some say at the Annual National Health meeting in March,

1992 - a delay in clarifying this issue will cause problems for USAID which needs formal assurances before approving construction start-up.

4. OPERATION AND MAINTENANCE OF COMPLETED FACILITIES

There is also a question of effective operation and maintenance of these facilities. Government institutions are all badly underfunded. The transit centers now in operation are all now assisted with staff and food supplies by ICRC and Handicap International. Given the government's precarious resource picture it is almost certain that whichever government agency takes on financial responsibility for the centers will require outside help. Further, since each of these centers will be very visible evidence of USAID/Mozambique collaboration it is especially important for both the government and USAID that they be well managed. We discussed the possibility of recruiting an NGO with institutional management experience to assist the government by taking management responsibility for transit center operations for a fixed period. The government was receptive to this idea.

5. CURRENT CONCERNS

SCF accepts a major share of the blame for the delays in implementing this project component. With the selection of a responsible Mozambican architect, who will also supervise construction, matters appear for the moment to be reasonably on track but it will take constant follow through to minimize the impact of the inevitable future delays. This will require full-time dedicated staff with sufficient experience with the technical and implementation issues associated with this kind of a donor funded construction project and the skills, temperament and seniority to break the inevitable administrative logjams.

SCF does not now appear to have enough available senior staff time to devote to managing this project component.

USAID is very frustrated by the slow progress in transit center construction. They believe that SCF has not moved as vigorously as it should have to implement this project component. Given the experience to date USAID believes that SCF should bring on additional senior staff dedicated to manage transit center construction and has agreed that the project would fund an additional expatriate for this purpose.

USAID also wants reconfirmation that there is no other program approach - through, for example, rental of existing facilities or a contract with an NGO to perform these services - that might enable USAID to help meet the need for transit housing without engaging in a complex construction effort.

- F. Progress Toward Output Six: To actively engage Mozambicans in productive economic activities through food production at hostels and income generating activities in two or three other sites

Sites

The project has sought to address this objective through a grant to the Mozambican Association for the Disabled (ADEMO). ADEMO is a non-governmental organization with two major objectives:

- (1) it is an advocacy group seeking better public understanding, respect and governmental benefits for the disabled; and
- (2) it is a promoter of small self-help projects and training for the disabled.

With the exception of an initial grant of about \$10,000.00 from the Mozambican government in 1988 to set up provincial offices, all financial support has come from donors and ADEMO's revenue-generating activities.

1. THE ADEMO ORGANIZATION

Organizationally, ADEMO is nominally a national organization with headquarters in Maputo and regional affiliates headquartered in each provincial capital. The team visited the national director in Maputo in an office of the Ministry of Education where she is employed (ADEMO has no office facilities in Maputo). The team also visited regional offices in Nampula and Beira. The team visited Inhambane and Quelimane as well, but was told that ADEMO was either inactive or unavailable for the team's visit.

The Nampula ADEMO organization is very active and has received grants from the Mozambican Womens' Organization

and the US Embassy-managed self-help fund, as well as in-kind assistance and training from HI. They have an arrangement with the Provincial Ministry of Education for an education program for the disabled for grades 1-5, and they have received parental and community assistance to enable them to hire teachers to extend the training to grades 6 and 7.

In addition, the Nampula ADEMO has small revenue-generating projects in tailoring, traditional basket-making, lace-making and carpentry. They produce a small newsletter with funds received from HI. Although they receive no funding directly from the government, the Provincial Governor has facilitated licenses for handicapped small entrepreneurs, and has waived certain small fees. Currently in temporary quarters in the former chapel of a convent, reconstruction of a house using US Embassy self-help funds is almost complete.

ADEMO in Sofala Province was a very different organization. It is physically located in a hot basement office with nearby open sewage in a building which is part of the national school for the blind in Beira (Mozambique's second largest city which has suffered greatly from the war and decay). ADEMO in Beira appeared to be largely an organization of the blind, with virtually no resources and little activity. They told us that they had submitted a carpentry project to ADEMO/Maputo and never received a reply. The team was told unofficially that there is an attempt to establish a separate organization for the blind and that there is bad feeling between the Maputo and Beira ADEMO directors. The team asked for a copy of the carpentry project and Dr. Calu promised to follow up with ADEMO/Maputo as well as submitting the proposal to the Embassy-managed self-help fund. With the school for the blind as their principal (if not only) benefactor,

ADEMO/Sofala is in very poor shape -- the school itself is barely surviving on contributions from relief organizations.

ADEMO/Maputo has received assistance from other donors including OXFAM, the Norwegian Association of the Disabled, Save the Children (U.K.) UNICEF, and WHO. Training courses have been held in accounting, typing, administration, literacy, leadership, recruitment, and shoemaking. Additional funds are being sought to begin courses in sewing and hairdressing.

2. ADEMO AS AN ADVOCATE

With less than four year's experience, ADEMO has achieved significant success as an advocacy organization. In a socialist-transitional society, it claims to be the first officially recognized governmental lobby group. ADEMO's major effort in securing passage of an equal rights for the disabled amendment to the Constitution (article 69), is seen by them as their keystone achievement. They have also promoted regional efforts including a southern Africa conference attended by lawyers and governmental officials from Zimbabwe, Lesotho, Malawi and the Republic of South Africa. That conference called for the creation of a separate governmental entity for the disabled. As a result of that conference in July 1991, the President of Mozambique has pledged 100 million Meticaais (about \$50,000.00) for the construction of an ADEMO headquarters. [NOTE: no funds or land had been made available as of the time of the team's visit.]

3. THE PROJECT SUBGRANT

The project subgrant through HI to ADEMO for \$50,000.00 included a significant proportion to be passed to provincial ADEMO organizations: \$9,000.00 for small

projects, \$4,500.00 for provincial set-up and supplies, and \$1,300.00 for provincial travel. It was not clear to the team that any of these funds had been made available to the provincial organizations, or, indeed, that there was any plan to do so in the near future. Both HI and the Mission were aware of the lack of clear financial records being kept by ADEMO/Maputo. The Project Paper contemplated the ADEMO funding to be for small projects. The exchange of letters between HI/ADEMO and the Mission (which constitute the Grant Agreement) included funds for ADEMO's administrative costs and provided funds for a minibus to be used by ADEMO to transport its members. While the team was not charged with the responsibility of performing a financial audit of the ADEMO subgrant (or, indeed, any other portion of the project) it appears that the funds are not being utilized in the manner contemplated in the Grant Agreement or the Project Paper. In addition to the apparent unwillingness of ADEMO/Maputo to release funds to the provincial offices, the ADEMO/Maputo office is using the project-funded minibus for a lease arrangement with the Ministry of Education. While the profits from this arrangement are very useful to ADEMO in meeting recurrent costs, it is not the purpose for which the vehicle was justified, i.e., the transport of ADEMO members. Monitoring of these funds is further complicated by the fact that this is a subgrant through HI. Apparently because ADEMO is not a registered PVO, and because of a pre-existing relationship between HI and ADEMO, the Mission chose this mechanism. The arrangement was accepted reluctantly by HI, and is a source of concern to HI which feels that ADEMO (and its Maputo Director in particular) has its own agenda and is not responsive to HI' direction. The team's view is that ADEMO/Maputo is more interested in its advocacy role than in its provincial small-project role, and is using the grant to those ends, despite the wording of the Grant Agreement. The team is not opposed to

the advocacy role -- indeed, it is needed and ADEMO appears to be very effective. The concern is that the Mission, HI and ADEMO need to agree on the proper use of funds and amend the Grant Agreement, if necessary, to accurately reflect the agreed intended uses of the funds.

The team was impressed by both the need for assistance to the disabled population of Mozambique, as well as by the organizational ability and dedication of the members, all of whom put in very long hours on a volunteer basis. While the administrative ability of the provincial organizations appears to vary widely, and the relationships between and among the parts of this very young organization are still developing, there is little question that very small amounts of money can make a very large difference to these shoestring operations. The Embassy- managed self-help fund should be encouraged to assist local ADEMO projects. If the Mission review of the first ADEMO subgrant can iron out the kinks, and if a clearer funds-control mechanism can be arranged, the Mission should attempt to channel funds to ADEMO through other sources of assistance to small businesses, Democratic Initiatives funds for advocacy groups, linkages with other donor organizations, as well as through funds available from this project.

4. LONGER TERM CONSIDERATIONS

Reintegration into the weak economy of Mozambique is an ambitious goal for the disabled. Disabled farmers can hope to return to reasonably productive lives in agriculture, and educated city-dwellers can hope to take advantage of such courses as accounting and typing. The disabled illiterate city-dweller faces a much more difficult task among the thousands of able-bodied illiterate city-dwellers who are competing for the few jobs which exist. While ADEMO is clearly too small an

organization to tackle this task alone, its advocacy program to secure preferential Government jobs and programs for the handicapped is a starting point, and ADEMO is an organization worthy of what assistance we can provide.

III. PROGRAM SUSTAINABILITY

The original Project Paper (8/31/89) did not foresee the creation of a sustainable project:

"Given Mozambique's precarious and donor-dependent economic situation, it is unrealistic to expect when this project is completed that the present emergency treatment and rehabilitation for war casualties can be financially sustained with country resources. If an emergency need still exists three years from now, donor financial assistance will be required to meet it.

Facing these economic realities, even the highest governmental priorities receive insufficient resources. The prosthetics program, while considered important by the Mozambican Government, is not among the highest health priorities.

The constraints facing this country have become even more acute in the past three years:

- per capita annual income is \$80, making Mozambique the poorest of the poor. Ministry of Health spending on health services (private medicine is still not legal) is estimated at less than \$2 per person per year;
- the decade-long war persists, making rural health services impossible. RENAMO targets health workers, and over 1,000 rural health posts have been destroyed. Transportation to rural areas is difficult, dangerous and expensive (often only by air). There is no functioning health network outside cities;

- estimates of displaced persons either within or outside the country range from 2-3 million (total population 15-16 million);
- social indicators continue to be poor -- the infant mortality rate is estimated at 159, under 5 mortality rate at 297. Life expectancy is estimated at 49. The female literacy rate is estimated at 16%;
- trained personnel in the health field are almost non-existent. The only medical school graduates 20-25 physicians per year. There are only 6 Mozambican general surgeons in the country, and 1 orthopaedic surgeon. All categories are thin, e.g., only 5 trained social workers. In remote Cabo Delgado province, there are no surgeons and only 1 mid-level surgical technician for the entire province, with some health posts run by so-called "serventes" with only three months of formal training;
- specialized health care is almost entirely dependent on expatriate physicians who are largely from former eastern Bloc socialist friendship arrangements and who will be leaving at the end of their present contracts;
- major changes are expected with the forthcoming reform of the law permitting private medicine (implementing regulations are due to be issued in April) -- the effect on health care for the vast majority of poor Mozambicans is unclear;
- with few exceptions, maintenance is unknown in Mozambique, and the war situation, and the habit of asking "cooperators" to donate new equipment has further undermined maintenance efforts -- the Health Ministry is probably no better or worse than the norm.

For the non-priority prosthetics area, which has been the almost exclusive province of the donors, allocating the meager resources of the Ministry is a tall order. ICRC has a phase-out plan with a target of mid-1995 which calls for a one and a half year transition after the end of the training program which has one more year to run. The plan has been submitted to the Ministry of Health, but no reply has been received to date. HI is still expanding its program, and talks about 5 or 6 more years. All discussions are based on an assumption of a cessation of military activities in a reasonably short time. Continued military action at recent or expanded levels would obviously change all planning.

ICRC's prosthetic production must be viewed as an emergency-response program -- there is no reasonable expectation that there could be a Mozambican-financed prosthetic production facility using the level of technology and imported materials in the ICRC program. The ICRC Director sees his goal as "technical sustainability" by which he means that there would be sufficient trained Mozambican personnel to run the program if it were financed by some outside source. While there clearly will be sufficient numbers of trained technicians, the team has several concerns:

- will there be adequate managerial capacity?
- will the technicians with their internationally recognized diplomas seek greener pastures elsewhere?
- will a purely financial input by a donor be sufficient without a full-time on-site professional expatriate to run interference with the bureaucracy and the Ministry's competing priorities, and be a conduit for technological innovation and access to new ideas and materials?

The HI program is designed to be as inexpensive and indigenous as possible. The success to date in getting HI trained staff incorporated onto the Ministry of Health's rolls is encouraging. The major concern about the sustainability of HI workshops is managerial capacity. The mid-level prosthetists being trained by ICRC will manage the workshops which will be staffed by lower level technicians trained by HI. There are the concerns mentioned above about the departure of the mid-level technicians for greener pastures elsewhere. There is also a concern that the ICRC training will create technicians who are unable or unwilling to work with the relatively crude HI products. A portion of the training of the ICRC mid-level technicians will include working on HI products in an attempt to deal with this potential problem.

In summary, the emergency production phase of the project can be allowed to phase out as and when the war-created demand recedes. The production facilities, if needed because of continuing hostilities, must be externally financed and, in the team's view, externally managed, preferably by ICRC. The relatively inexpensive, indigenous and unsophisticated level of the HI program offers the only real hope for Mozambican sustainability, and that is questionable without continued HI input (at a declining level) for five to ten years.

IV. EVALUATION FINDINGS

1. The Mozambique Prosthetics Assistance Project is a constructive and effective use of resources from the War Victims Fund. The project objectives remain valid. During the first two and a half years considerable progress has been made toward reaching the project objectives and the bulk of the most important activities are performing well.
2. There has been an inordinate delay in establishing a more precise estimate of Mozambique's need for prosthetics assistance. The field survey is now completed for all but two provinces but these data have not yet been tabulated or analyzed. This information is needed to help formulate future plans and to support any future requests for additional external assistance.

Considering the uncertainties created by the continuing civil war, the precarious state of the country's finances and the availability of donor assistance it is unrealistic at this time to design a long range rehabilitation plan for Mozambique as called for in the original Project Paper.

3. The production of prostheses is reasonably on target. With the graduation of the ICRC and HI prosthetist classes next year additional skilled manpower will become available and a significant increase in production can be expected.
4. We do not know the degree to which the prosthetics program is meeting needs. A cessation of hostilities will allow the return of an estimated 2-3 million refugees and allow easier surface transportation as well as increasing possible mine injuries as farmers return to abandoned fields. These factors may well cause a surge in prosthetic demand.

5. As long as the difficulties in transport and communication caused by the war persist it is not possible to establish an effective prosthetics follow-up program. Both ICRC and HI rely essentially on self-referral; it is probably the best that can be done for now. The revised Project plan objective calls for "an effective clinical follow-up program for amputees" which is unrealistic.
6. There is a functioning prosthetics repair program that appears to be meeting current effective demand.
7. The project's training objectives are being met both for physical therapists and prosthetist/orthotists. 29 students are enrolled in the HI physical therapy course. 19 students are enrolled in the HI basic prosthetist/orthotist course. 19 students are enrolled in the ICRC certificate course. New teaching materials for each of these courses have been developed, approved and are in use.
8. There has been an inordinate delay in the construction of the transit centers. The team agrees with the Mission that the primary responsibility for this delay lies with SCF, but the Mission could also have exercised its leverage more effectively with SCF and the Government to resolve logjams more expeditiously. These facilities are still needed -- in fact, the demand for spaces is greater than when the project started and is growing. The facilities now in use are of very poor quality and should be replaced now. The team explored the possibility of alternate approaches (such as rental facilities or an NGO that had facilities), with Government officials, HI and ICRC at all of the locations. While the team appreciates the Missions reluctance to enter upon a construction activity, the team found no practical alternative.

There is a continuing management problem at the centers now in use. All are badly underfunded by the government and require outside help which is now being supplied by ICRC and HI.

9. With the departure of Dr. Fisher and the absence of orthopedic surgery residents, the project's orthopedic surgery training objectives are being largely unmet. Considering this circumstance, HVO's shift in emphasis to the training of middle level medical-technical professionals is appropriate. Recruiting surgeons for short-term assignments with Portuguese language skills is proving more difficult than anticipated but language skills are a vital component to working effectively in a teaching role. [NOTE: Spanish or Italian-speakers would be able to work effectively].

Some limited short term professional training upcountry has been carried out but a shortage of volunteers with appropriate language skills has limited HVO's efforts to meet the program targets for short-term T.A.

The revised Project Paper contains indicators of progress toward the output of improved quality of clinical case management which (given the revised program focus) are no longer fully appropriate as HVO goals:

- "...establishing professional consultation between surgeons and rehabilitation staff as standard practice prior to surgery" which is unrealistic under current circumstances;
- "establishing an effective clinical follow-up program for amputees" which is unrealistic under current circumstances;

-- "a 'client-responsive' prosthesis maintenance program" which is doing the best it can under chaotic logistic conditions.

10. USAID has supported ADEMO's requests for needed core support using funds that were planned in the Project Paper for small self help projects.

Only \$9,000 of the \$50,000 allocation for self help projects has been earmarked for projects outside Maputo, and none of these funds have yet been allocated.

11. While considerable efforts are being made to achieve technical sustainability, the prosthetics project continues to be financially unsustainable without continued donor inputs. With their very limited financial resources and the relatively low priority accorded this activity there is little likelihood that the government will allocate sufficient funds to these activities to assure sustainability.

12. The project can expect to make only limited progress in increasing the economic self-sufficiency of the handicapped. The most intractable problem is the handicapped illiterate urban dwellers who will be competing for the very limited number of opportunities with the masses of urban under and unemployed.

V. EVALUATION RECOMMENDATIONS

1. The project should be extended for an additional year (to July 1994). This extension will enable the transit centers and the training courses to be completed during the life of the project. The Mozambican Project Coordinator should be extended through the life of the project. [NOTE: This recommendation is based on a great reduction or cessation of armed hostilities. Continued or increased levels of hostilities would call for a new judgment about the need and usefulness of continued assistance beyond July 1994].
2. USAID should be receptive to future requests from ICRC for support for the orthotic workshops in Beira and Quelimane, and from HI to help cover the additional costs of training programs and expansion of provincial workshops.
3. The revised HVO workplan emphasizing mid-level training should be implemented, utilizing a "no funds" extension if required. The Mission should recast the indicators of progress for the clinical case management output to reflect the revised focus of the HVO program. (Short-term HVO trainees with language skills should continue.) Additional funding for HVO is not recommended at this time.
4. Given:
 - a) delays in the transit center element of the project;
 - b) the Mission's justifiable unhappiness with the performance of Save the Children in managing the design and construction;
 - c) the belief by both ICRC and HI that the transit centers are critically needed; and

d) the concerns about management of the centers;

the team recommends that USAID escalate its monitoring and pressure. Save the Children's regional office in Zimbabwe and international headquarters should be made aware of the delays and the displeasure of the Mission and AID/W. Their assistance should be sought to bolster Save the Children's local administrative and management ability -- project funds for this purpose would be appropriate, if needed. If Save the Children is unable or unwilling to comply, their withdrawal from this aspect of the project should be sought, with Mission direct contracting with the A & E firm seen as a last resort.

5. USAID and the Government should recruit a responsible NGO to assist the Ministry in the operation of the transit centers for a specified period (4-5 years). Additional resources may be needed as an inducement to the NGO (PL 480 Title II or project resources).
6. USAID should move as expeditiously as possible to tabulate an analysis the data collected in the survey of health facilities where amputations have been performed.
7. USAID and AID/W should rethink its assistance to ADEMO in light of its dual role as political advocate as well as micro-project developer. The team recommends that ADEMO be informed that should they seek further assistance from USAID, that they would need to make improvements in their accounting and become a locally registered PVO. Provincial ADEMO offices should be made aware of the Embassy-managed self-help fund for micro-project funding.

Location of Activities- Mozambique Prosthetics Project

1. International Red Cross - (ICRC)

Manufacture of Artificial Knees, Feet and Orthotic Components. Maputo

Fitting of ICRC Artificial Limbs Maputo
Beira
Quelimane
Nampula

Training of Prosthetist/Orthotists (certificate level) Beira

Assistance to Support Existing MOH Transit Centers Maputo
Beira
Quelimane
Nampula

2. Handicap Internationale (HI)

Manufacture and Fitting of Prosthetics and Orthotics Ongoing Villanculos
Inhambane

Planned Tete
Lichinga

Manufacture and Fitting of Orthotics Nampula

Training of Physical Therapists and Prosthetists (9th form) Maputo

Transit Center Construction (non-project funds) Inhambane

3. Health Volunteers Overseas (HVO)

Improving Quality of Orthopedic Clinical Care Maputo

Provision of Equipment and Materials All
Provincial
Hospitals

Upgrading the Teaching and Clinical Care Facilities Maputo

Inservice Training for Medical Staffs Maputo &
Quelimane

External Technical Training United States
& Portugal

4. Save the Children (USA)

Logistical Support for the HVO staff

Transit Center Construction

Maputo

Maputo

Beira

Quelimane

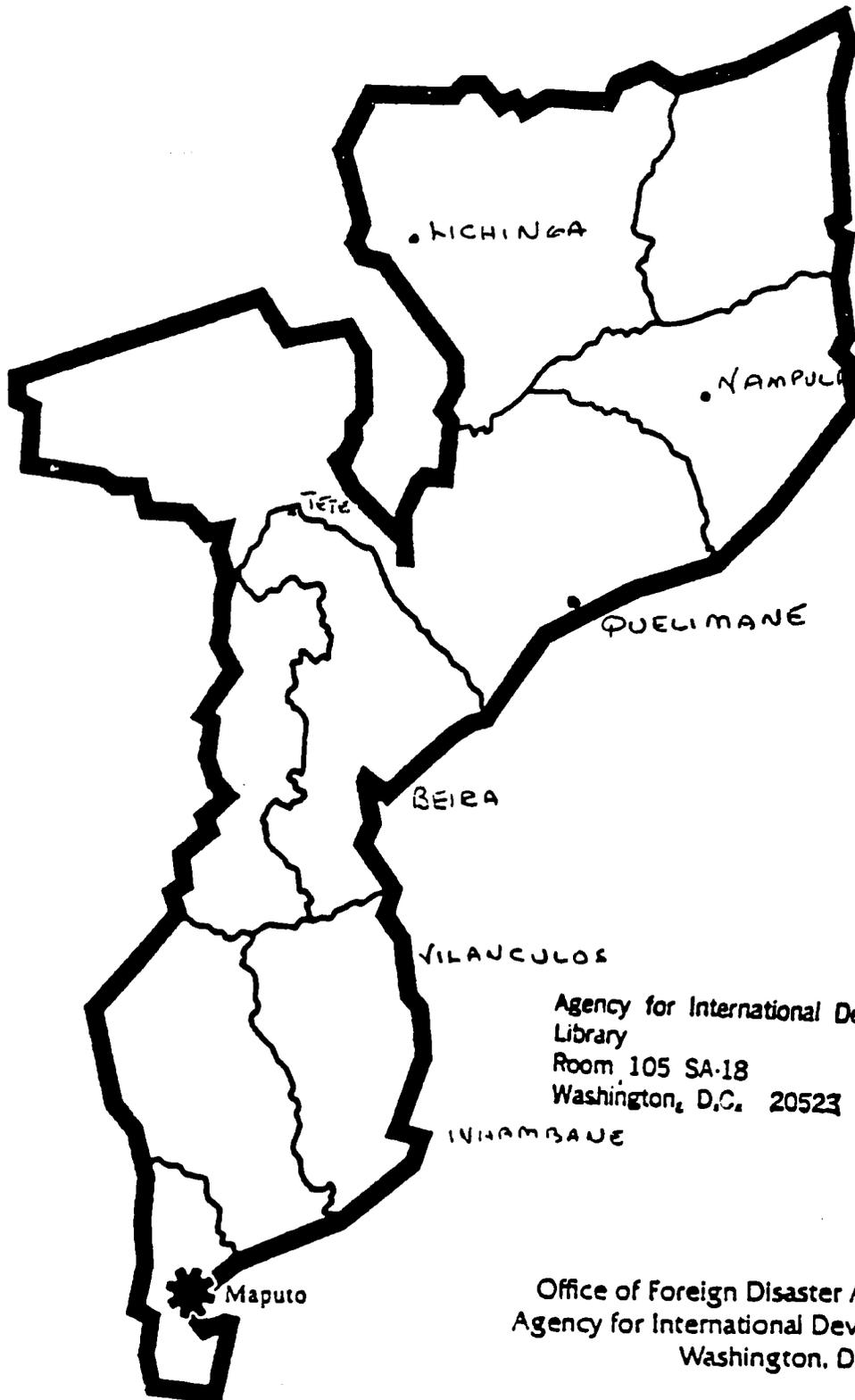
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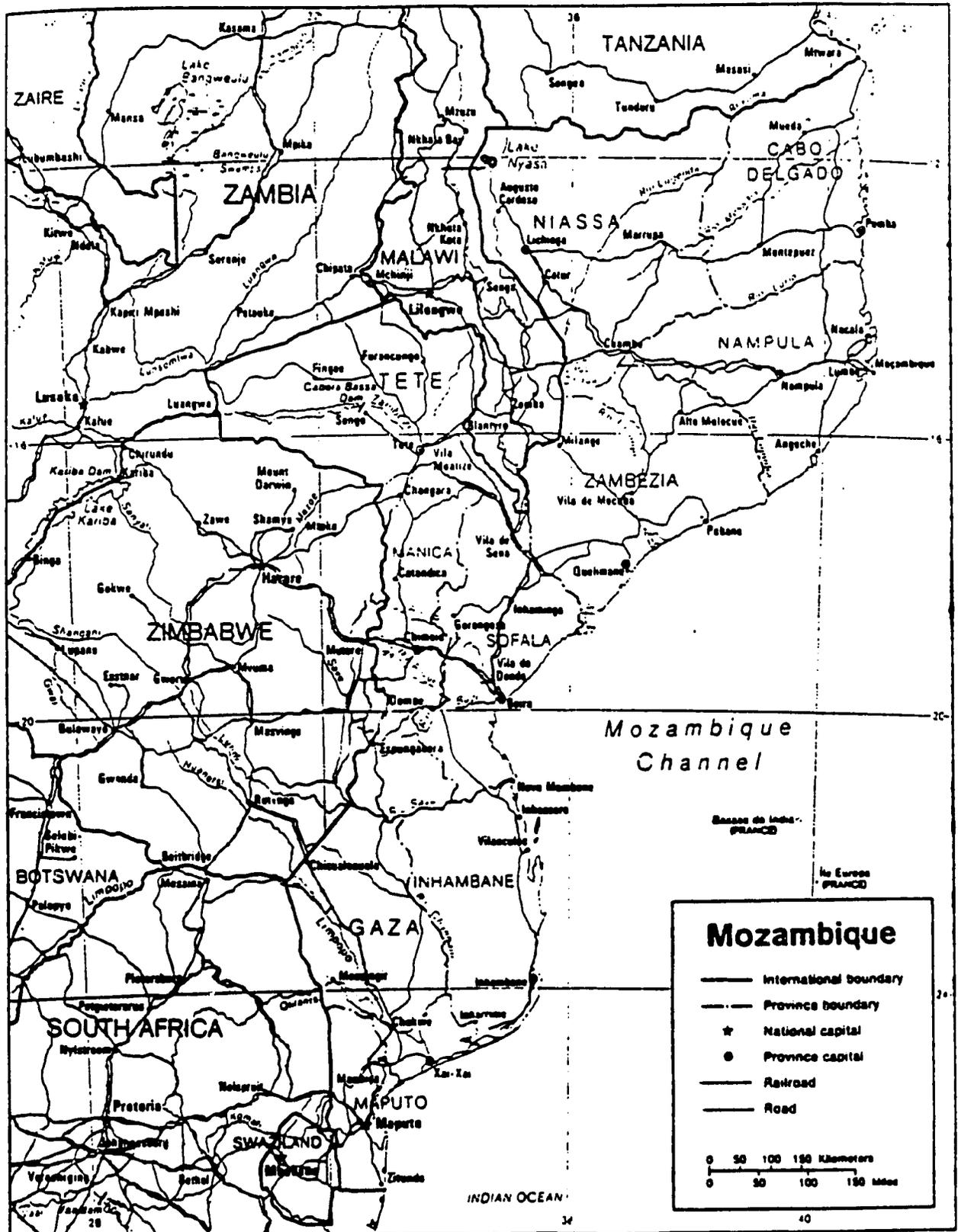
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