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EVALUATION:
MOZAMBIQUE PROSTHETICS
PROJECT

A Report Prepared by PRITECH Consultant(s):
RON ALTMAN
PETER CROSS
BERNIE CHAPNICK, Team Leader

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SUMMARY AND RECOMMENDATIONS

Since the midterm evaluation of this project in early 1992, the technology and cost-factors involved in the manufacture of prosthetic devices have changed dramatically. The rapid worldwide shift to polypropylene fabrication has reached Mozambique. The International Committee of the Red Cross (ICRC) has shifted from the previously used polyester resin technology and is now using sheet and crushed polypropylene (available from South Africa) and recycling their own scrap into prosthetic devices that:

- are technically superior (stronger and lighter);
- are faster to produce;
- are cheaper to produce;
- utilize a standardized mass-production, interchangeable component method which will allow repair and replacement at any center in the country;
- unlike the resin method, does not use dangerous chemicals that have short shelf-lives and are difficult to store;
- require much less machinery; and
- require less technician-time for fabrication and allow the technician to concentrate on fitting the patient;

With the cease-fire in Mozambique, the demand for prosthetic services is increasing, and will continue to do so for some time. This apparent anomaly is dramatic and is based on:

- greater mobility for potential patients;
- greater access for field outreach programs;
- return of amputees from refugee and rebel areas;
- new injuries caused by people returning to farming and encountering mines; and
- an increasing number of prostheses in use, each of which will require repair/replacement within about three years.

This increase in effective demand is already outstripping production capability in the traditional workshops operated by Handicap International (HI) where primary level technicians fabricate individual devices from leather and wood.

The team believes that this technological revolution offers the opportunity to capitalize on the great strengths of both ICRC and HI. While the following recommendations will require further discussion and negotiation with ICRC and HI (probably including their headquarters), the team believes that the potential advantages of these changes far outweigh the costs of any bureaucratic reprogramming. Both the HI and ICRC chiefs of party were receptive to the team's initial presentation, although neither was prepared to speak for his organization without consultation with headquarters. The team proposes:

- a) all prosthetic devices in Mozambique be standardized on the polypropylene technology;
- b) all components be manufactured at the ICRC Maputo workshop, and distributed to all other centers [precedent for this single-technology/central manufacturing approach exists in Kampuchea where ICRC manufactures polypropylene components for all operating agencies, including HI];
- c) the ICRC facilities in Maputo and Beira be used to train the HI technicians in polypropylene technology [technical training only, not upgrading from level 1 to 2];
- d) HI manage all rehabilitation services, and all the transit centers with their patient training programs, and train ADEMO and/or other local NGOs to take over;
- e) the planned ICRC termination be reviewed to allow completion of the technical training of the HI technicians;
- f) the privatization effort (see Proposed Organization of Prosthetic Services), which had been independently conceived within the Ministry of Health, be aggressively pursued by the Mission.

The HI budget would have to be revised to exclude prosthetic manufacture, include operating more rehabilitation centers, include training ADEMO and/or other local NGOs to take over the management of the centers, and extend AID funding five years (through 1998). The ICRC budget would have to be revised to include the costs of training the HI level 1 technicians in polypropylene technology, possibly slightly extending the time of their grant, and slightly higher costs for manufacture of sufficient components to meet national demand (an additional oven and another set of molds).

As the fallback option, if the decision is made to terminate the project at the current PACD, the team recommends that efforts be concentrated on the conversion to the polypropylene technology, including the necessary training of the HI technicians. In addition, if the current PACD holds, every effort should be made to

find another international donor to take over the project, since the effort will not be sustainable at that point. The major USAID investment in prosthetics in Mozambique will be in dire jeopardy if no additional funding source is found.

The team is acutely aware of the restrictions on AID personnel worldwide and in Mozambique. The team understands that the new General Development Officer will have a full plate when she completes language training. Nonetheless, the team is compelled to state that the preferred option of an extension to the project and privatization of the prosthetics program will require some senior management effort to bring the ICRC/HI realignment into being, and in promoting privatization. An occasional front-office query and/or nudge would also be extremely valuable.

OTHER ASPECTS OF THE PROGRAM:

The construction of the transit centers, after years of delay and frustration outlined in previous evaluations, now appears to be on track. The Maputo center is under construction and is scheduled to be completed in January 1994. Construction is expected to begin in Beira in November 1993. Both centers are using the same architect and design as the Inhambane center built by HI which the team found exceptionally well constructed and managed. The team visited the construction site in Maputo and the plot in Beira and are sanguine that the new Save the Children director is on top of the program. As part of the visit to the Maputo site, the team was surprised to discover that the plot adjoined the site of the HI children's rehabilitation center. After some discussion, it was learned that both were part of a larger plot, all of which belonged to the Ministry of Health. The team proposed to HI that it take over the entire area as one site, allowing them sufficient space for a garden plot for which no space is available in the current configuration.

The Health Volunteers Overseas (HVO) surgical upgrading program is unfortunately not much further along than it was in the previous evaluation. Bureaucratic delays and obstacles from both the Ministry and AID have delayed and frustrated surgical training to the point where the grant's imminent termination in December now prevents starting (even assuming the snafus stopped). For reasons largely outside the control of HVO (see the midterm evaluation for the history), this aspect of the program has been limited to lower level training and the provision of equipment and supplies. While useful things were done (such as nurse training and the provision of orthopedic surgical kits), the basic purpose -- the upgrading of orthopedic surgeons -- never took place.

The Mozambican Association of the Disabled (ADEMO) which is now three years old has made very significant progress since the last evaluation. Now more mature with clearly defined goals and

objectives, Ademo now has a membership of more than 6000 all of whom are disabled. At this time ADEMO is concentrating on the issues surrounding equality of rights for the handicapped. ADEMO has developed written materials on the laws pertaining to the handicapped, booklets designed to assist the disabled in their pursuit of equal rights. They have targeted jobs, education, and training as specific areas of concentration.

ADEMO has obtained support from a variety of sources: USAID, UNICEF, HI, the Norwegian Association of the Disabled (NAD), the Norwegian Government (NORAD), OXFAM, SCF, and the Swedish Government (MS). In addition they have received assistance from the government electric corporation which has provided 16 wheelchairs, and a Mozambican business organization (Manica Freight Services) which has provided some \$100,000 in products and services. As a consequence of the cease-fire, efforts in the districts are now being actively pursued, and more handicapped people are being found.

This organization clearly has moved forward in its efforts on behalf of the handicapped. ADEMO sees itself as a political organization fighting for the rights of the handicapped rather than as a technical organization. Presumably it could become a significant player in the effort to gain some degree of financial independence as they have proven themselves to be very effective fund raisers, though at this time they are more concerned with the projects they have been involved in, and do not appreciate the difficulties facing the prosthetics project.

The team also visited the office of ADEMIMO, an NGO for military personnel who became disabled as a result of their military service. ADEMIMO is a new organization. Its principal objective is to identify, recruit, and organize disabled military personnel, forming an institution which can successfully lobby for the rights of its membership and develop internal support groups among its membership. Disabled military personnel of both FRELIMO and RENAMO are eligible for membership in ADEMIMO.

ADEMIMO claims there are approximately 6,000 disabled military personnel, of whom 2,000 are "members". The staff believe that the great majority of disabled military personnel are amputees, many double amputees. Of the 2,000, however, only 10 are current with their monthly dues of 2,000 Mt. The staff indicate that its membership can not afford to pay their dues, because they have not yet begun to receive their military pensions, although many have been disabled 10 or more years.

The staff report that the situation of disabled military personnel is little short of desperate. The team visited a "transit center" where many are housed in poor conditions, lacking water and with only two toilets for more than 100 people. In the

provinces, the disabled are frequently not welcomed by their families who are also impoverished and see the disabled veterans as an additional person to feed who does not contribute to the family income. This is clearly a destitute group deserving of support.

In July, ADEMIMO received approval from the EEC for its first project which will provide \$149,000 to assist them with their initial organizational tasks. They also have the support of HI in the form of a French advisor who also provides assistance to ADEMO. Once again HI's commitment to some of society's neediest persons deserves both admiration and support.

With respect to the Project, it seems clear that ADEMIMO is currently in no position to help assure sustainability. If it is successful in its organizational efforts, however, it may become an effective advocate for a large group of disabled persons. If that happens, it may make a significant contribution to sustainability by attracting both Mozambican and international resources in support of this important group of disabled persons. The Project should be sensitive to possible interventions which might help ADEMIMO achieve its goals.

TECHNICAL ANNEX

GLOSSARY

ORTHOTICS refers to the design, measurement and fitting of devices which stabilize a limb, prevent or correct a deformity. In spinal orthotics it refers to stabilizing the spine.

PROSTHETICS refers to the design, measurement, fitting and aligning of artificial limbs to replace the missing limb.

STATE OF THE ART refers to that level of technology which represents the most advanced iteration [a prosthesis in the USA or Western Europe with titanium and graphite components and hydraulic joints might cost in excess of \$20,000 each].

APPROPRIATE TECHNOLOGY refers to that level of available technology which, taking into account all of the relevant factors, results in the selection of a methodology which will provide the highest level of function. The issue of establishing the appropriate level of technology may seem to be complicated, but in fact, as a result of the advances made in prosthetics over the last two decades, the selection is quite simple. Prostheses need to be simple, as inexpensive as possible, durable and easy to fabricate, however the prosthesis must also meet another set of criteria which ultimately are critical to the success of any prosthetics project. Prostheses must provide true function, which is to say that the person for whom the device is made should be able to reasonably replicate normal human ambulation. There are established criteria for the determination of what is acceptable for any given level of amputee.

FUNCTION refers to the ability of the amputee to approximate that of the normal person. It can also refer to the level of inherent function of a prosthetic design.

The fundamental purpose of prosthetic rehabilitation is to provide an artificial limb to an amputee which is as near to normal as possible. In societies where people are dependent on walking for virtually every basic need, it is critical that the prosthesis fit and function properly.

A SIMPLIFIED VERSION OF THE PROSTHETIC PROCESS:

- the amputee is evaluated at the prosthetics center;
- the patient can be fitted with a definitive prosthesis; or
- the patient can not be fitted because additional surgery is needed, more time is needed for healing, or is judged not suitable for prosthetic fitting, i.e., needs a wheelchair.

If the patient is ready for a preparatory limb, generally a very basic pylon with a plaster temporary socket will be fitted. This provisional prosthesis is intended to help the limb mature and shrink the tissues so that a definitive limb will fit properly for a longer period of time. The time for the preparatory process varies from a few weeks to several months. During this process the fit of the provisional prosthesis deteriorates as the stump shrinks and the prosthesis becomes less functional. If the patient is ready for a definitive prosthesis, the patient is measured and casted, a socket or a diagnostic socket is fabricated, and the components are selected. The patient is fitted with either the definitive or diagnostic socket. The socket may need to be redone if the fitting is inadequate, which is the reason for using a diagnostic socket. The prosthesis must be aligned. A new patient will require training in order to learn how to use the prosthesis (gait training). There are also a variety of adjustments that are generally part of the fitting procedure. The prosthesis is completed. There are usually post delivery adjustments required. The patient is discharged. How long this process takes depends not just on how long it takes to fabricate the limb, but is also a function of the condition of the patient, and in particular the condition of the patient's stump.

ICRC has completed a three and a half year basic education program with twenty three graduates who have been trained in fundamental prosthetic/orthotic principles and accepted standards. The course was approved by the International Society of Prosthetists/Orthotists (ISPO), and the graduates are providing patient services at generally acceptable levels with management level support.

The ICRC facilities for component fabrication represent the most appropriate configuration for providing satisfactory rehabilitative services in this environment. Additionally, the conversion to polypropylene modular components manufactured in Maputo has the potential to increase both the quantity and quality of prostheses. This is based on significantly reduced fabrication time, simplified fabrication procedures, and the resultant ability to concentrate on the fitting and adjustment procedures. In short, ICRC has well-trained people using appropriate technology, and achieves generally acceptable fitting standards. They use contemporary below knee supra condylar suspended hard socket alignable prostheses, pylons and SACH feet. Quadrilateral sockets with functioning knee joints, lightweight pylons and alignment ability are used for above-knee amputees.

Polypropylene is rapidly becoming the most universally used thermoplastic material in the world. It is readily available, inexpensive, easily worked, and can be reprocessed, modified, repaired, and has strength, flexibility and durability. The appropriateness of thermoplastics in developing countries was

established in the 1970's all through the South Pacific where devices were fitted to widely dispersed populations who could not travel for repairs, and needed devices which would not deteriorate in the tropical climate.

The team visited the HI center in Inhambane, and was very impressed by the holistic approach to rehabilitation which includes vocational and literacy training, as well as physical rehabilitation. The mechanism puts into perspective the true role of prosthetic services which is to provide the most functional tool possible, so that patients may return to or exceed their life styles before injury.

The center provides amputees with critically important socialization and support which allows them to do better collectively than they would on their own. They are given skills and knowledge, they participate in the functioning of the center, grow vegetables and raise animals for consumption and sale, and meet and live with other people. This truly effective program is one of the most important factors in achieving successful rehabilitation of the amputee, and should be replicated at all the centers in Mozambique. The combination of the broad based total functional rehabilitation program run by HI assisted by a contemporary prosthetic program would be the best model for Mozambique, and an example to be replicated in other countries.

The orthotics program in Maputo is run by the Ministry of Health in their main orthopedic ward at the central hospital. It had been established some years before the ICRC prosthetics program was started. It is located in adjacent space, but with no official connection to ICRC, which has, however, been helpful in getting materials. There is a cordial relationship between the two groups. The level of orthotic technology is consistent with the traditional methods used in most countries. The team saw a variety of lower extremity orthoses made from aluminium with leather cuffs and pads. In addition there was also evidence of spinal orthoses including a traditional scoliosis brace. The technicians have been there for some time and recently two of them spent six months in Sao Paulo for additional training.

The major problem confronting orthotics services is not the technical ability to produce acceptable devices i.e., properly designed, fabricated, and fitted, but rather the much larger issue of knowing when and which device is correct. Orthotic services are more complex than prosthetics because there are often other factors involved in the determination of whether some one should be braced or not (this is normally done through a prescription from an orthopedic surgeon. At the present time there seems to be no reason to disturb the orthotics program as it is run and staffed.

As the use of thermoplastics increases there will be a natural point in time for the upgrading of orthotic services. It will also be necessary for the other areas of medical practice to be better equipped to deal with prescription criteria in order for orthotics services to move forward.

At the present time there is an effort by HI to provide the handicapped children in the Maputo area with rehabilitation including physical and occupational therapy as well as education and training for the families with these children so they can deal more effectively with having a handicapped child. The program seems to be very well run with clearly defined goals and an appropriately equipped facility, which is adjacent to the soon to be completed transit center in Maputo.

FINANCIAL ANNEX

The Prosthetics Assistance Project was initiated to meet the need for prosthetic and rehabilitation services in Mozambique. Of necessity, it included a number of training activities. The Project has been largely successful in meeting its original objectives. Some training programs have been completed and others are nearing completion. An increased number of amputees have been fitted with prosthetic devices and increased numbers of wheelchairs and crutches have been manufactured. The total demand for these devices has not yet been met. In fact, demand will continue into the future since prostheses, wheelchairs and crutches wear out and must be replaced, approximately every three years in the case of prostheses, and total demand is expected to increase to about 2,500 prostheses per year, with greater access to the northern and rural populations.

The Project has successfully developed several key inputs that will be required to respond to the anticipated increase in demand for prosthetic services. In particular, adequate numbers of personnel have been trained, a cost-effective production technology has been developed and adequate service delivery models have been tested. One key step remains to convert what was initially an emergency relief project into a development project which will have lasting benefit to Mozambican amputees. The institutional and organizational infrastructure through which services can be delivered and which will capture sufficient financial resources to assure its own permanence. The rest of this annex is devoted to presenting the principal findings that bear on the sustainability of prosthetic/orthotic services and a preliminary description of a possible strategy for developing the necessary institutional and organizational infrastructure. Although sustainability is a real challenge in what the World Bank has ranked as the poorest country in the world it is believed that the proposed strategy would permit USAID to gradually withdraw its support over a five year period without sacrificing the investment already made. Successful implementation of the strategy would provide a model for similar projects in other countries and for other projects in Mozambique. The findings concerning the sustainability of the program are:

1. The Project Paper's conclusion (p. 21) that the Government of Mozambique will not be able to sustain the prosthetic services capacity developed by the PAP is at least as valid today as in 1989. The Project Paper states:

"The MOH cannot sustain a prosthetics program at this level without continued donor assistance. Also, given the MOH's other priority needs, it is debatable how much of their own resources they should elect to spend for this program."

2. The Government of Mozambique is not in a position to fund orthotic and prosthetic care, since essential preventive and primary clinical care services are severely underfunded. Indicators from the World Development Report 1993 include:

Per capita GNP is \$80.
Life expectancy at birth is 47 years.
Female adult illiteracy is 79%.
Total fertility rate is 6.7.
Infant mortality rate is 149 per 1000 live births.

The World Development Report 1993 (World Bank, 1993) also indicates that the minimum per capita financial requirement for essential preventive and primary clinical care is approximately \$12 (p. 10), that the Government of Mozambique spends only \$5 per capita (1990) for all health services (including non-essential tertiary care), and that more than 50% of total "Government" health spending is funded by foreign donors (p. 210).

A comprehensive financial analysis of the health sector was completed in 1992 by Abdul Razak Noormahomed (MOH) and Malcolm Segall (University of Sussex) which supports the observations in the World Development Report 1993. Indicators provided in "O SECTOR PUBLICO DE SAUDE EM MOCAMBIQUE: UMA ESTRATEGIA POS-GUERRA DE REABILITACAO E DE DESENVOLVIMENTO SUSTENTADO" (which will become available in English by the end of October 1993) include:

- in 1991 the MOH spent less than \$0.04 per capita on medicines and received donations worth \$0.99 per capita for medicines;
- MOH spending for medicines decreased 98% from 1981 to 1991, while during the same period, the number of health workers increased more than 30%;
- in 1991, international donors financed 61% of the health system's operating costs;
- average health worker compensation fell 56% from 1981 to 1991.

3. With Project funding the ICRC has developed and tested in Mozambique an appropriate, effective, low-cost technology for producing prostheses.

The actual cost of producing the prostheses in Mozambique is not known, since the technical feasibility of production has only recently been tested. The technology is currently in use in Vietnam. Leg prostheses cost between \$40 and \$60. (Fitting costs, including physical therapy and temporary lodging but excluding patient transportation, are estimated to be approximately \$50 to \$70.)

4. With Project funding ICRC has trained 23 mid-level technicians capable of fitting prostheses, a number sufficient to satisfy expected demand, assuming adequate support staff and a total of 7,500 needy amputees.

The number of amputees who need prosthetic services is not accurately known, nor is it known how many of those amputees have knowledge of or access to service [both HI and ADEMO are starting field outreach programs, now that the cease-fire has made rural travel reasonably safe.

It is anticipated that prostheses will, on average, have to be repaired/replaced every third year. Estimated total cost of serving the amputee population is estimated to be approximately \$300,000 per year, excluding amortization of donor funded training, construction, equipment and technical assistance. Estimated cost of prosthetic and physical and social rehabilitation services per amputee is, therefore, \$40.00 per year or \$3.33 per month.

5. For amputees being fitted with prostheses, with Project funds HI has built and established highly efficient transit centers, including one in Inhambane which provides shelter, 3 meals and some basic literacy and gardening and animal husbandry training for less than \$1.00 per day per patient.

This estimate of the cost does not include amortization of donor funded building, equipment, and training. It does, however, include the value of food and other donations received from relief organizations, as well as most salaries. (The transit center is located on the grounds of the hospital, and therefore does not pay the salaries of the guards.) The administrator of the transit center (trained by HI) maintains complete and accurate accounts.

With the ICRC's new technology, it is estimated that the average length of stay in the transit center can be reduced to 21 days. (It is further assumed that only 2/3 of the amputees will elect to stay in the transit center. \$21 is included in the cost of fitting a prostheses for transit center costs.

6. The transit center in Inhambane is an ideal model for other transit centers yet to be established by the Project.
7. Although the annual per person expense for prosthetic services (\$40.00) is considered beyond the reach of most amputees (50% of per capita GNP) and would be an inappropriate use of funds by the Mozambican Government, since the total recurrent funding required is relatively small (approximately \$300,000) the financial and managerial/organizational sustainability might be approached through partial privatization.

This possibility is outlined separately. If successful, it would permit USAID to withdraw its support of the program over a period of approximately 5 years. Other sources of funding would be gradually developed including contributions by amputees, private companies, international philanthropic organizations, and indirect fundraising by Mozambican NGOs (e.g. ADEMO).

8. The MOH's "Health Manpower Development Plan 1992 - 2002" does not mention prosthetists as a manpower category, although the MOH is hiring graduates of project funded courses. The mentioned plan indicates that the MOH currently employs 24 Rehabilitation technicians and 54 Rehabilitation Aids.

As indicated in Conclusion 2, the MOH should not be encouraged to fund rehabilitation services until other preventive and priority primary care services are adequately funded. This report recommends that the Project support the development of non-governmental institutions which would employ most prosthetists and many rehabilitation technicians and aids. This would directly promote the sustainability of prosthetic and rehabilitation services and would indirectly promote the MOH's ability to support other, higher priority services.

As indicated in the conclusions, turning responsibility over to the Government of Mozambique is not considered to be either feasible or appropriate. Furthermore, the recommended strategy does not require amputee payment or co-payment for prostheses, although that may be feasible and appropriate in some cases. The recommended strategy is to develop a network of independent organizations linked by business relationships and which together produce inexpensive, but technically acceptable, prosthetic, orthotic and rehabilitation services. Most amputees will continue to receive free or subsidized services for the foreseeable future, although AID's role as a source of funds would be phased out, possibly in five years.

1. Organize and assist the "Mozambican Prosthetic Component Production Facility (MPCPF) developed by ICRC as a private organization with the trained personnel as the principal shareholders. ICRC would develop the MPCPF's internal management and quality control systems. The Project would support this effort with management consultants as requested and negotiated with ICRC.
2. Assist the mid-level prosthetic technicians establish Prosthetic and Rehabilitation Service Centers (PRSC) in conjunction with the physical therapy technicians trained by HI. These centers would be owned by their employees, at least initially. There would probably be six or seven PRSCs.

3. The MOH would continue to support these centers, perhaps on a declining basis, by providing working space in existing hospitals and a grant to each center equal in amount to the salaries currently paid to PRSC personnel who are on the MOH's payroll.
4. Each PRSC would function as a private group practice (in essence a private business) which would purchase prosthetic components from the MPCPF. (The MPCPF might purchase other supplies, such as plaster, in bulk and resell them to the PRSCs.) The PRSCs would pay salaries and purchase other materials and services as required to produce prosthetic and rehabilitation services.
5. The Project would provide the required initial capitalization and technical/training support for the development and implementation of management systems. Acting through an NGO, the Project would purchase prosthetic and rehabilitation services from the PRSCs.
6. Other agencies (international and Mozambican philanthropic organizations, the Mozambican Ministry of Defense, insurance companies, wealthy amputees, etc.) could also purchase the same services for other amputees. As these sources of financing are developed, purchases by the Project can be reduced and perhaps, during a period of 5 years, eliminated. (The estimated total annual funding required, approximately \$300,000 in not great and is a fraction of current project disbursements.)
7. Initially, the MOH would make grants to the PRSCs equivalent to the salaries currently paid PRSC employees who resign from the MOH. Over time the amount of the MOH grants might be reduced, permitting reallocation to higher priority preventive and primary care services.
8. As private businesses, it is relatively easy to design and implement incentives to reward productivity. (the team recommends that the MPCPF and PRSCs be organized as independent financial entities, thus simplifying both management systems and the link between productivity and income.)
9. The primary object of the Project would become the development of the MPCPF and PRSCs as independent organizations capable of self-management and of becoming financially self-sufficient. (As indicated, for the foreseeable future, third parties will probably pay for nearly all of the services provided.)
10. It is anticipated that the PRSCs will need support in fund raising. (This need may be permanent, but is expected to

decline over time.) Initially this support may be provided by international NGOs, such as ICRC and HI, but might eventually come from organizations such as the ADEMO and the Mozambican Red Cross.

11. The MPCPF could be weaned from subsidies relatively quickly, since it would receive full payment for each prosthetic component sold. (Initially the sales price would be negotiated with the centers, ICRC, and USAID, to permit only a small profit. Both USAID and ICRC would help the MPCPF export some of its production to neighboring countries. It is possible that the MPCPF could sell components to other USAID and ICRC missions in other countries.)
12. The revised project design would include incentives to encourage the PRSCs to identify other sources of income, including co-payments (where appropriate) from the amputees and international philanthropic organizations that work in Mozambique. (PRSC sustainability is not anticipated in less than five years.)
13. The Transit Centers (TCs) should probably be organized as separate businesses. (It is important to keep the individual cost centers as small and simple as possible. The link between performance and income is clearer in small organizations, and management systems are much simpler.) Appropriate management and accounting systems appear to be functioning exceptionally well in Inhambane.
14. Initially, the TCs will provide services only to PRSC patients. They will be reimbursed by the PRSCs from the funds they receive for prosthetic and rehabilitation services. (Assuming that the TCs have excess capacity, they may sell services to other possible clients, such as family members of hospital patients.)
15. The Project should fund, not only the development and implementation of all required management systems for the MPCPF, PRSCs and TCs, but should develop and produce manuals which document these systems. (The systems are not expected to be complex. Thus the manuals will be simple, but are essential to long-term sustainability of the institutions to be created.)

**Prosthetic and Rehabilitation Service Center
Estimated Annual Operating Cost**

The following budget is illustrative only, in many cases the costs are little more than best guesses. It suggests, however, that the expense of the proposed service is sufficiently low to justify a thorough financial feasibility analysis.

Salaries: \$	
1. Mid-level prosthetist (2 @ \$50/mo. - 13 mo./yr.)	1,300.00
2. Mid-level physical therapist (2 @ \$50/mo.)	1,300.00
3. Basic-level technicians (4 @ \$25/mo.)	1,300.00
4. Administrator/manager (1 @ \$50/mo.)	650.00
5. Secretary/clerk (1 @ \$25/mo.)	325.00
6. Messenger/cleaner (2 @ \$25/mo.)	650.00

Services:	
1. Telephone/FAX (\$20/mo.)	240.00
2. Water (Government Contribution)	
3. Electricity (Government Contribution)	
4. Postage and Shipping (\$25/mo.)	240.00
5. Travel (2 trips/yr. @ \$240/trip)	480.00
6. Photocopies (100/mo. @ \$.20)	240.00
7. Maintenance services (\$30.00/mo.)	360.00

Supplies:	
1. Office supplies (\$25/mo.)	300.00
2. Plaster & other prosthetic supplies (\$100/mo.)	1,200.00

Temporary Lodging Costs:	
1. Transit Center (21d @ \$1/d for 12p/mo.)	3,024.00

TOTAL	11,059.00
TOTAL per patient	51.19

Principal Assumptions: Each PRSC provides services to 216 patients per year; transit lodging is required for only 2/3 of patients and for only for 21 days each; Lodging costs will be \$1/day, corresponding to current HI experience in Inhambane. (Accao⁻ Social estimates are as high as \$6/day, but appear high).

Financial Recommendations:

1. The MOH and Accao⁻ Social should not be encouraged to fund prosthetic and rehabilitation services for amputees.
2. The Project should estimate the costs of producing polypropylene prosthetic components and of providing the prosthetic and rehabilitation services through the PRSCs.
3. Sustainability be incorporated as an objective and the project extended sufficiently to achieve that objective.