

ENERGY INITIATIVES FOR AFRICA

LESOTHO SUB-PROJECT:

IMPROVED RURAL PRODUCTIVITY THROUGH MARKETING  
& DISSEMINATING ENERGY TECHNOLOGIES

A TECHNICAL REVIEW

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## P R E F A C E

The Energy Initiatives For Africa (EIA) Project (#698-0424) is a multi-country effort by A.I.D. to promote economic development in Sub-Saharan Africa through a wide range of activities and strategies to improve the supply and use of energy. Part of the EIA's Project's work was carried out through sub-projects, some of which were at the national level and others at the multi-country regional level. EIA was initiated in Fiscal Year (FY) 1982 and eventually resulted in sub-projects in seven countries and with two regional organizations. EIA also undertook technical assistance and other activities in most A.I.D.-assisted countries in Sub-Saharan Africa. Substantial EIA activity occurred in about twelve countries. Starting in FY 1988, EIA was redirected to focus on natural resources management, though a range of broader energy activities continue in several EIA Sub-projects which received no cost Project Action Completion dates (PACDs) into FY 1988 or early FY 1989.

Several formal and informal reviews/evaluations have been conducted on the EIA Lesotho Sub-project. These focused largely on the specifics of Sub-project design and on details of implementation. The purpose of this present technical review is to examine the Sub-project within the context of the umbrella Energy Initiatives For Africa (EIA) Project. As such, this review attempts to pull back from the details where possible, and to present a more general examination of the Sub-project's goals and strategies and lessons which might be learned.

This technical review is based on examination of the written record collected in Washington, Maseru, and Nairobi, and on interviews and several site visits in Lesotho in March 1988. This write-up is intended to serve as additional information for the team conducting the formal evaluation of the Energy Initiatives For Africa Project during March through May 1988. The formal evaluation of EIA deals with project and sub-project activities from Fiscal Year (FY) 1982 through FY 1987.

## GLOSSARY OF ACRONYMS/TERMS

ATS	Appropriate Technology Section (originally of the Min. of Cooperatives & Rural Development, later of the Min. of Interior, Chieftainship Affairs and Rural Development)
BNFES	Basic and Non-formal Education System (U.S.A.I.D. Project)
E/DI	Energy/Development International, prime contractor for the EIA Project
EIA	Energy Initiatives For Africa Project (A.I.D. Project #698-0424)
GOL	Government of Lesotho
Growhole	a coldframe/hotframe structure for raising seedlings; permits early start on seedling growth to extend the growing season
LAPIS	Lesotho Agricultural Productivity Improvement Systems (U.S.A.I.D. Project)
NGO	Non-Governmental Organization
PACD	Project Activity Completion Date
PCV	Peace Corps Volunteer
PVO	Private Voluntary Organization
REDSO/ESA	Regional A.I.D. office for East and Southern Africa, Located in Nairobi, Kenya
RET	Renewable Energy Technology Project (USAID/Maseru #632-0206)
RHC	Retained Heat Cooker
TA	Technical Assistance

## I OVERVIEW & MAIN POINTS

### (Design)

The Lesotho EIA Sub-project For Improved Rural Productivity Through The Marketing and Dissemination of Energy technologies (#698-0424.32) was initiated in September 1984 and ended in September 1987, with an obligation level of \$250,000 and a final expenditure level of about \$227,000. The Sub-project was designed as a direct follow-on to U.S.A.I.D.'s Renewable Energy Technology Project (RET) which had developed the specific technologies to be produced and marketed under the EIA Sub-project. RET worked closely with the Appropriate Technology Section (ATS) of the Ministry of Cooperatives and Rural Development and ATS served as the counterpart organization for the EIA Sub-project. Monitoring in the field was to be provided by U.S.A.I.D./Lesotho and on-going technical support and oversight was to be provided through short-term TA and visits by the EIA regional office in Nairobi, with additional support from the REDSO/ESA Energy Advisor.

### (Goals)

This Sub-project sought to increase rural incomes and employment through the marketing, dissemination and commercialization of energy-related technologies. On the production side, the Sub-project sought to encourage and assist the Lesotho small and medium scale private sector to produce metal cookstoves, metal grates and bars for stone stoves, horticultural growhole kits, and other devices (e.g., RHCs) developed under RET. EIA assistance to potential private producers was provided through technical information on product design, training in production techniques, and in some cases, advance purchase orders for products to be later sold through ATS. On the demand side, the Sub-project sought to increase awareness of opportunities for improved efficiency of energy used by households and institutions through several different dissemination strategies, including training of "multipliers" who would in turn train others at the community level, and the use of various media, including radio, print, and tee shirt decals.

### (Approach)

With the funding from EIA, ATS would hold training sessions with local artisans on construction techniques for the energy saving and other devices. Where necessary, ATS would also stimulate production of these devices by placing purchase orders with the producers. Concurrently, ATS would work through various channels

to spread word to communities in Lesotho about the advantages of its improved technologies and techniques. One information dissemination technique was the use of "multipliers" who would demonstrate to communities the usefulness of these devices.

Sub-project funds were used to pay some salaries at ATS, for training activities carried out by ATS, for vehicle maintenance, and for technical assistance. It was expected that strong linkages would be formed between the ATS's EIA sub-project-funded activities on the one hand and on-going GOL, U.S.A.I.D., and other donor and NGO/PVO programs on the other. These linkages were expected to be particularly strong in the dissemination efforts. The major beneficiary groups were expected to be rural households, local artisans, government institutions and non-governmental community organizations. Employment and income were to be generated through the local manufacturing of the devices. Households and institutions would benefit through increased availability of cost-effective devices for energy and other purposes.

EIA would also assist ATS through technical assistance. Prior to the obligation of sub-project funds, EIA funded work on a survey of household cooking in Lesotho and an explanation of the capabilities of the small and medium-scale private sector to manufacture the ATS stove. During the course of the Sub-project, EIA also funded a stove consultant who worked with the ATS to improve the design of its metal stove.

#### (Outcomes)

The Sub-project did achieve some important successes. Several hundred stone stoves were installed in schools and several hundred metal stoves were manufactured and are gradually being sold. Despite some short-comings, the training sessions appear to have had some real impacts. ATS also developed reasonably effective dissemination strategies for providing information to households on its various energy and agriculture equipment and improved techniques.

Unfortunately, the important production-side goal of stimulating the indigenous private sector met with little success. The metal stoves which were eventually produced have a limited market because of their relatively high cost (roughly \$60 US at 1988 exchange rates) and they were manufactured in the Republic of South Africa, not Lesotho. Efforts to have local artisans manufacture these metal stoves failed. Attempts to have the artisans make the other equipment, such as grates for the stone stoves and horticultural growholes, thus far have met with only occasional and temporary success. In the area of dissemination, the 1986 Mid-term Evaluation noted that there was insufficient follow-up support from the ATS to the "multipliers". Inadequate

follow-up to recipients of training continued to limit the effectiveness of the ATS efforts throughout the remainder of the Sub-project and this problem persists today.

In his final write-up on the Sub-project, the REDSO/ESA Energy Advisor noted that the Lesotho Sub-project was

in certain respects the weakest of all the Sub-projects in the region...

In its September 1987 Final Evaluation Cable, the Mission noted significant problems in the management and design of the Sub-project, and outlined a number of basic changes in approach which it recommends employing in similar efforts in the future. These changes include the use of full-time resident technical assistance and management and the establishment of a capital fund to help address the financing problems facing the small scale private sector.

Surprisingly, the E/DI EIA Quarterly and Annual reports fail to mention these serious short-comings in the Sub-project's outcomes. For example, the FY 1987 E/DI EIA Annual report (December 1987) summed-up the Sub-project with the comment that

... this Sub-project proceeded to close down, most of its objectives having been achieved.

Considering the comments made in various evaluation reports, and during recent interviews, this summary statement in the 1987 Annual Report, at best, requires extensive qualification. Overall, the descriptions in the E/DI EIA periodic reports give a highly positive picture of the Sub-project, without reference to disappointments in the case of production-side activities. In short, they fail to give a balanced view.

#### (Influencing Factors)

ATS suffered from the loss of key personnel at several junctures. A 1986 change in government in Lesotho added further to ATS staffing problems. These difficulties were compounded by persistent transportation shortfalls in a Sub-project with important outreach/training activities. On the A.I.D. side, Mission personnel with oversight responsibility changed several times over course of the Sub-project. And, in the end, it became clear that the private sector in Lesotho faces several major obstacles whose significance was not fully appreciated when the Sub-project was designed.

The process of economic development is a complex one with many necessary and few sufficient conditions for success. This Sub-project set out to do many interdependent things with very limited resources. Some of its accomplishments are impressive and worthy of note, but the causes of its failures must also be considered.

It is important to note that ATS achieved what success it did in the face of major, unanticipated problems. The ATS staff's dedication to their work is exemplary.

## II CONTEXT FOR SUB-PROJECT ACTIVITIES

### (Preceding Activity)

The EIA Sub-project was a direct, albeit somewhat delayed, follow-up to assistance provided by A.I.D. to ATS under RET. The Sub-project was one with strong counterpart staff commitment and one which could build on the experiences of the previous work. The Sub-project's goals of strengthening the indigenous private sector and educating consumers to stimulate demands for improved energy technologies were clearly ambitious. This was particularly so considering the relatively low funding level (\$250 K) and absence of fulltime on-site technical or management assistance to the ATS, an organization which had grown in capability over the course of the RET project, but which was still far from being adequately staffed or funded at the start of the EIA Sub-project. In short, the Sub-project had some important advantages not shared by a number of EIA Sub-projects in other settings (i.e., enthusiastic counterpart support and directly relevant previous experiences to build on), but it nevertheless was taking on formidable tasks.

### (Staffing)

Due to the approximately 18 months delay between the ending of U.S.A.I.D. support to ATS under RET and the start of EIA support, and possibly due to other factors as well, two key engineers left the organization before the start of EIA activities. They were not replaced, and ATS's technical capability remained weak over the course of the EIA Sub-project. The significance of this gap was the subject of discussion and some debate among the various AID actors. The Mission felt that the loss of the engineers seriously weakened ATS' ability to perform its work. REDSO/ESA and EIA Nairobi noted that while the loss of the engineers weakened ATS, the particular technologies of interest to the EIA Sub-project were mature enough that this weakness was not seriously detrimental to ability of ATS to implement the Sub-project's specific activities.

Only several months after the start of the EIA Sub-project, the head of ATS left the organization for another post. This dynamic individual had provided ATS with its vision and leadership and his loss is still felt today.

In 1986 there was a change of government in Lesotho and a subsequent governmental reorganization which included abolishing ATS' parent ministry and eventually placing ATS within the newly created Ministry of Interior, Chieftainship Affairs and Rural Development. The overall governmental reorganization contributed to difficulties in filling a number of ATS positions. The April 1986 Mid-Term Evaluation noted the ATS staffing deficiencies as a major contributing problem. Action by the GOL to address the staffing problems was made a condition for extending the PACD from September 1986 to September 1987. Although some progress was made subsequently in expanding ATS staffing, deficiencies in the number and skills of ATS staff remained a problem throughout the life of the Sub-project.

It should be noted that despite its internal problems and the obstacles it faced, ATS did achieve relative success in several activities, particularly in the dissemination activities and in the case of stone stoves for institutional use. As others have noted, such accomplishments are a testament to the dedication and drive of ATS staff persons in the face of adverse conditions. Most of the staff appear to be highly motivated and believe firmly in the importance of their work. Without this commitment the Sub-project would likely have been a near total failure, instead of one with a mixed record.

During the course of the Sub-project, funding was provided to support a Peace Corps Volunteer (PCV) to work full time with ATS. Unfortunately, he left the country after only several months with the ATS, and no replacement was assigned to this work.

The impact of the personnel losses was felt all the more keenly in the absence of fulltime involvement on the part of EIA or the mission. With only intermittent support from the outside, the withdrawal of key resident personnel working with ATS resulted in periodic losses of momentum and contributed to the organization's inability to deal effectively with obstacles when they arose.

On the A.I.D. side, three differently composed teams were involved in the design effort for the Sub-project. As the Mission noted in its Final Evaluation Cable, this left no institutional memory as to why certain design decisions were made. Within the Mission itself, responsibility for Sub-project supervision passed to several different persons over the period of Sub-project implementation.

### (Transport Problems)

The 1986 change in government and on-going governmental budgetary problems resulted in periodic and occasionally severe transportation problems for ATS. This restricted its ability to conduct training courses in dissemination strategies and construction of the ATS devices (e.g., metal stoves) and to provide follow-up support to recipients of TA and training. This problem was noted in the Mid-term Evaluation, and the GOL's lifting of restrictions on ATS' use of its vehicles was made a condition for extending the PACD. Unfortunately, improvements in this regard proved to be limited and intermittent. The inadequacy of transportation for ATS staff continued to act as a constraint throughout the sub-project and was cited during the interviews in March 1988 as an on-going problem.

### (The Private Sector)

The EIA Sub-project was an attempt to strengthen the private sector in a small country whose economy is closely tied to, and dominated by that of a large industrialized nation (the Republic of South Africa). This dominance is reflected not only in the limited economic potential for meeting local needs through domestic production, but also in the competition for labor between the home market and that of the nearby dominant economy. Lesotho is a country where imports account for a range of products normally produced locally in developing countries and one where the more talented members of its labor pool can readily find employment across the border. The problem of establishing a small business under these conditions is increased by the absence of financial institutions geared to working with small or medium scale enterprises.

In its Final Evaluation cable, U.S.A.I.D./Lesotho cited the need for a capital fund to help small business in Lesotho. During interviews with the Mission and ATS staff in March 1988, the present inability of small businesses to obtain financing was repeatedly cited as a major constraint on the development of the small scale private sector. The materials supply systems also appear to be a problem for small-scale producers, particularly in rural areas.

### III THE PROCESS OF SUB-PROJECT IMPLEMENTATION

As noted above, the ATS staff included a number of highly motivated and committed persons, and these persons were largely responsible for the relatively successful information dissemination efforts and limited production successes.

EIA provided useful technical in-puts. These included a household energy survey (by J. Gay) and an analysis of the market in Lesotho for cookstoves and the potential production capability (by G. Burrell). (Both of these studies were carried out in early 1984 prior to Sub-project implementation.) EIA also provided TA to the ATS on the refinements to the design of the ATS metal stove (by M. Kinyanjui).

Burrell's analysis of the sale of nonelectric household stoves showed that only about 10% of the Lesotho market would likely be open to the relatively high quality stove ATS wanted to have produced. However, he felt that the potential market of several thousand customers for higher quality stoves was large enough to warrant an attempt by ATS to serve this market. He proposed an initial test marketing of about 100 ATS metal stoves to evaluate consumer responsiveness.

Burrell also concluded that local workshops in Lesotho were capable of producing the stoves. (As noted above, unfortunately, only after considerable effort by ATS working with the local artisans and small-scale manufacturers did the constraints on their ability to respond become fully evident.) The TA by Maxwell Kinyanjui helped ATS to refine the design of this metal stove. However, despite improvements, the stove continued to be somewhat difficult and expensive to produce. Also, concern continued to be expressed about consumer response to the appearance of the stove.

Michael Bess of E/DI's EIA Nairobi office provided management oversight, and administrative support, as well as guidance and monitoring during his periodic visits to Lesotho. Tony Pryor of REDSO/ESA provided sub-project design, administrative and monitoring support and general guidance during his periodic visits over the course of the Sub-project. Various Mission staff, including L. Burniess, C. Fortunato, M. Yohnnes, and A. deGraffenreid at different times provided inputs to Sub-project design, monitoring, oversight, and evaluation.

#### IV IMPACTS

In the event, the EIA Lesotho Sub-project was a good try, but one which suffered from several adverse developments (with more or less cumulative effect) and in the end had to face the fact that the obstacles to small-scale private sector development in Lesotho are far greater had anticipated.

The Lesotho EIA Sub-project was one of only a few EIA efforts aimed specifically at strengthening of the private sector. Its

two pronged approach of stimulating the production of, and the demand for improved energy products in the private marketplace represented an ambitious, comprehensive approach. Some parts of these efforts worked rather well, even the face of obstacles, while others encountered insurmountable difficulties, given the available resources.

(Production-Side Activities)

Production and dissemination of improved stoves met with some success. The more basic goal of strengthening the private sector's ability to produce in various products in Lesotho has thus far met with only very limited success in a few cases. The principal disappointment is that even after several attempts and with TA from ATS, local artisans failed to produce metal stoves of acceptable quality, and responded in only a very limited fashion to ATS' efforts to have the metal grates and growholes made locally.

In addition to the metal stove work, ATS worked with rural artisans on the manufacture of metal stoves, growhole box kits, food dryer kits, and metal bars and grates for stone stoves. The most successful of these efforts was the training of several teams of artisans working for Save The Children, Lesotho. This work led directly to the construction of several hundred large stone stoves for use in over 100 primary schools in the country. Work on the local production of metal bars and grates for these stone stoves met with reluctance on the part of potential producers to make them without cash or materials advances. Eventually, ATS produced some of the grates itself to both demonstrate to local artisans the market potential and to satisfy demands it helped establish.

Work on the production of growholes and food dryer kits met with some limited success, but the availability of materials or cost problems again significantly slowed the response of the private producers. The principal obstacle to more rapid development of artisan activities in this area appears to be bottlenecks in the availability of raw materials (e.g., the plastic covers). ATS itself is limited in its ability to provide as much training and periodic technical assistance to the artisan community as it would like, due to its transport constraints.

The weakest part of the ATS work, and one which occupied much of its effort over the course of the Sub-project, was the production of the metal stoves. ATS spent a good deal of its early effort on improving the stove design and on up-grading production techniques. In this, ATS received short-term TA from EIA. Eventually ATS's training efforts with local artisans did result in the production of a few metal stoves, but these were either too costly or were of unacceptable quality. ATS then turned to

Lesotho Steel, a locally-based medium sized industry. After some early quality problems, Lesotho Steel produced several hundred stoves of acceptable quality and cost. However, it did so not at its Maseru facility as ATS had expected, but by having the stoves made at an affiliated facility in Bloemfontein, South Africa.

ATS continues to receive metal stoves from Lesotho Steel and has already sold several hundred on the market. Further production and subsequent market sales are expected in the future. One controversy is whether the ATS stove at M 130 (roughly \$ 70 US at the 1988 exchange rate) addresses an appropriate need for Lesotho's lower income households. EIA's preliminary studies in support of ATS' production of stoves showed that only about 10% of the households in Lesotho used stoves in this price range or above. As noted in its Final Evaluation, the Mission believes that the ATS metal stove is simply too expensive to meet the needs of the majority of local households. As reaffirmed in interviews, Mission staff believe that a lower priced device should have been developed and marketed by ATS under the EIA Sub-project. ATS staff and the EIA regional advisor, Michael Bess, strongly disagree, stressing that the ATS stove addresses an important market need and offers important advantages to consumers, including the ability to burn a wide range of locally available fuels.

The difficulty in working with the local small and medium-scale private sector was evident by the time of the Mid-term Evaluation in April 1986. The mid-term Evaluation noted that,

the greatest weakness in the ATS work with beneficiary groups has been with entrepreneurs.

The Mid-term Evaluation stated that "efforts are underway to fill these gaps," apparently through more attention on the part of ATS staff to training and quality control in their work with prospective producers. However, despite repeated efforts by ATS little progress was made in this area over the remainder of the Sub-project. Late in the Sub-project EIA contracted a local consulting firm to monitor Sub-project activities. Peat, Marwich, and Mitchel's Second Progress Report (submitted July 1987) took a close look at the ATS metal stove program. It concluded that small-scale production (batches of 50) is preferable to larger scale production, and that overall, ATS gained little by working with the relatively larger firms, such as Lesotho Steel. However, the consultant deferred until a later report its recommendations on the best approach by ATS to attracting small scale producers to manufacture a stove of acceptable quality.

It its Final Evaluation Cable the Mission stressed the financial problems of local small-scale producers.

Appropriate technology activities such as the EIA project can best be sustained, in our view, by building-in a capital fund to finance the establishment of local industries to replicate the technology that is being transferred.

(Demand Side Activities)

The ATS has been relatively successful in delivering information on energy conservation and equipment opportunities to the people of rural Lesotho. This work involved the use of "multipliers", that is, the training of trainers. ATS trained over 100 trainers from a number of different GOL agencies, and these persons in turn appear to have been reasonably successful in spreading the word to consumers about more energy efficient cooking techniques and in making people aware of the improved devices (e.g., retained heat cookers, and metal stoves) to make more effective use of available fuel and to grow more food or fuel (e.g., growhole kits). The Mid-Term evaluation noted the problem of follow-up to the initial training provided by ATS for the multipliers, citing ATS's transport bottlenecks. The Mid-Term Evaluation recommended that ATS limit the number of courses and to make each course more intensive. ATS apparently attempted to improve its training, but in the end seemed to have been unable to overcome its problems due to limitations imposed by persistent transport shortfalls, and staffing inadequacies.

Dissemination efforts with the multipliers were supplemented through the use of radio and other media (e.g., tee shirts) and this seems to have been reasonably successful. In its dissemination efforts ATS established effective links with a number of other GOL agencies under the Ministries of Agriculture, Health, and Education. These linkages developed to a greater extent than originally envisioned. The Sub-project's support to this type of liaison and networking within the host-country government must be considered an important benefit stemming from the Sub-project. Projected liaison between ATS and several Mission programs (e.g., LAPIS and BNFES) was less effective.

(Institutional Impacts)

The EIA Sub-project provided vital support to a struggling GOL agency and assisted this agency in furthering its aims of promoting the production and use of more efficient cooking devices and other types of equipment. The limited EIA resources were, however, insufficient to help ATS overcome its underlying limitations, notably staff capability and capacity for adequate follow-up on training and outreach. As Bess and Pryor stress, it

is not reasonable to expect EIA, by itself, to make ATS into a fully viable institution.

In 1988, some months after the end of EIA assistance, ATS remains a relatively weak and vulnerable institution, but one which the GOL seems to have come to recognize as one doing important work and one which should be continued even in the absence of outside funding. Without EIA support, ATS may well have been terminated.

The ATS program addresses important needs (i.e., household and institutional cooking, and increased food production techniques) and ATS attempts to do so through what has become an increasingly directed focus of AID assistance worldwide -- the strengthening of the indigenous private sector. The fact that ATS now seems likely to continue in existence is encouraging. The staff's commitment to the work of helping households and others improve the efficiency of energy use is important, particularly considering Lesotho's problems with environmental sustainability and the prospect of higher energy prices in the longer-term. Hopefully, AID or some other donor will support the ATS in this work in the future.

#### V CONTRACTOR PERFORMANCE

##### (Short-term TA)

The quality of the work performed on the Sub-project by E/DI staff and its subcontractors was generally of high quality. Both the Mission and the ATS staff have a high regard for the work of Michael Bess of E/DI's EIA Nairobi office in Sub-project design and monitoring. The EIA-funded short-term assistance by Guy, Burrell, and Kinyanjui was provided in a timely manner and addressed important information and technical needs. It is all too easy in hindsight to identify oversights and needs which were not adequately addressed. Overall, the TA provided under EIA to this Sub-project was valuable in moving the Sub-project forward.

##### (Reporting)

As with the EIA project in general, important information on the Lesotho Sub-project was not available in Washington. Uncoordinated actions on the part of A.I.D./Washington, REDSO/ESA, E/DI and others left the EIA files in Washington with major gaps. The most complete set of records available in Washington was the contractor's Quarterly and Annual Reports to A.I.D./Washington. Unfortunately, the information in these reports is typically very general. Where specifics are given, the information is usually descriptive rather than analytic. In

the case of the Lesotho Sub-project, issues of content are compounded by the question of balance.

The write-up on the Sub-project in the E/DI EIA Quarterly and Annual EIA reports presents to the reader a picture of successes, particularly in the case of information dissemination. Where production side developments are mentioned, it is in regard to a success. The only problems noted in the periodic reports relate to ATS staffing. There is no mention of ATS' repeated disappointments in its attempts to have equipment and parts made locally, problems perhaps most dramatic in the case of the ATS metal stove, but extending also to the manufacture of metal parts for the stone stoves and to the other technologies, such as growholes. The Mid-Term Evaluation's concern that ATS' work with the entrepreneurs was its greatest weakness is nowhere reflected in the E/DI EIA reports. The Quarterly and Annual reports mention the number of ATS stoves being made, but do not say that they are being imported from the Republic of South Africa. The Sub-project's successes are certainly worthy of comment, but they are balanced, and in some cases at least partly overshadowed, by very real failures. Such a balanced picture is absent from the Quarterly and Annual Reports.

The attitudes and perceptions of various reviewers may account for a substantial difference of opinion about the Sub-project. Certainly, ATS takes an up-beat view similar to that presented in the E/DI reports, stressing the successes. For its part, the Mission appreciates the successes and has a high regard for the dedication of ATS staff. However, the Mission also notes that some important hoped-for outcomes did not develop. The picture which emerged over the course of this technical review is one of a counterpart organization making the best use of limited resources, accomplishing some important ends, but despite its best efforts, failing to accomplish others -- largely because the problem was far more difficult than expected.

It may be true that in a narrow, quantitative sense the Sub-project did meet "most" of its objectives, i.e., with regard to training sessions held, stoves sold, and extent of networking with other organizations. In some cases ATS fell short of the stated numerical goals for a particular objective, but in other cases exceeded them. If all objectives on the production and demand side are given equal importance, then it may be that more than half were achieved. However, to take such a narrow view would be to miss the point that an important part of the Sub-project's purpose was to strengthen entrepreneurial capability, and this was not achieved. The narrow view would also fail to consider the interdependence among Sub-project objectives. In other words, to what extent is the significance of successes in information dissemination on improved technologies/techniques diminished by the absence of adequate production of the equipment and parts? The ATS metal stove is admittedly

available to consumers through imports, but at a cost that is likely to be affordable to only a small subset of households in Lesotho. Hopefully, the production side will one day catch up with the demand side successes, but this was not the case during the course of the Sub-project.

(Information Exchanges/Conferences)

In its Final Evaluation Cable, the Mission noted concern about the lack of information available in Lesotho on EIA activities elsewhere in Africa. The cable argued that in the absence of information exchanges (going beyond periodic newsletters), that

... it may be that opportunities were lost to modify the subactivity or shift its emphasis to take advantage of experiences learned in other sub-projects.

In light of the Mission's interest in a capital fund for small business development in Lesotho, it would seem that more extensive exchanges with the EIA Sub-project in Malawi -- one which worked directly with an intermediate financial institution -- may have been particularly useful for Lesotho.

The periodic visits by Bess and Pryor to Lesotho and the Kengo Sub-project's cookstove training for ATS staff in Kenya provided opportunities for information exchange at a personal level, but the Mission clearly feels that more was required. Pryor noted the Mission's concern on this point in his technical review (11/29/87). The Mission's cable lists several possibilities, including yearly conferences for Mission personnel and counterparts involved in EIA sub-projects. Such conferences may have been particularly useful, if they were focused on direct exchanges among the various country teams (Mission personnel, counterparts, and where applicable, resident A.I.D.-funded advisors) and involved candid discussions of successes and failures, as well as presentations on purposes and approaches. EIA and REDSO personnel could have served as moderators and resource persons, with the Mission energy officers, EIA counterparts and any resident sub-project personnel being the principal participants in the conference(s). Such conferences should probably be considered in the design of similar efforts in energy or other fields in the future.

## VI LESSONS LEARNED

The Lesotho EIA Sub-project potentially offers a number of important lessons for the design and implementation of donor-funded assistance in energy, in private sector developments, and other fields. These are outlined below.

(1) Considerations in the design of programs to strengthen the small-scale private sector:

-- strengthening the indigenous small-scale private sector is likely to be a difficult, slow process, requiring a flexible approach, addressing the obstacles on several different fronts, and requiring a long-term commitment of resources.

As the experiences of this Sub-project demonstrate, an underdeveloped local private sector may be the consequence of constraints not be readily identifiable at the start. The Sub-project's effort to strengthen the artisan sector was apparently initiated in the belief that the principal constraints were inadequately trained manpower and lack of awareness of market potential. These problems did exist, but ATS' efforts to overcome them did not result in an effective response from the artisans. Most persons interviewed for this technical review now cite the non-availability of financing and the drain of skilled labor to South Africa as the major problems.

One approach which may be more effective is to make assistance to the private sector broad-based, proceeding in distinct stages over a relatively long time horizon (e.g., 5-10 years). Initial efforts might address a few problems (e.g., training needs and demonstration of market potential) and then, as required, the assistance could move into other areas (e.g., financing, improving technical or managerial efficiency). The long-term development benefits are potentially very great, but the efforts may need to be carefully refined (and perhaps fundamentally redirected) as more is learned about the nature of the obstacles to private sector development in a particular setting.

(2) Considerations in designing assistance to host-country institutions:

-- effective assistance to small, still relatively weak host-country institutions may require full-time resident technical assistance and management, at least for part of the period of assistance.

The Mission noted in its Final Evaluation that it learned from the EIA Sub-project experiences that in activities of this type,

it is preferable to have full-time project management and to have a resident technical advisor to assist in strengthening host-country management. It may be that had ATS been adequately staffed, this gap would have been less crucial. Unfortunately, inadequate host-country staffing is a common and persistent problem. As a temporary measure, resident technical assistance may be the only means of ensuring continuity and persistence in project implementation.

(3) Setting realistic goals:

-- the Sub-project's goals were, in retrospect, ambitious and complex.

The 1985 E/DI EIA Annual Report described the Lesotho Sub-project as one which

... will increase agricultural productivity in the rural sector through the marketing and dissemination of energy technologies.... Dissemination will involve the active participation of existing agencies and PVOs. GOL capabilities for continuing outreach, training and extension after the sub-project's completion will also be strengthened. Five GOL ministries and their extension network, several national parastatals and international PVOs will participate in this effort. Sub-project components include development of a nationwide dissemination program, support of a local marketing group and production of multi-fuel metal stoves by local artisans. These outputs will be achieved through extension, surveys, production of teaching materials and workshops for staff and the general public.

These partially interdependent ends were to be achieved by a still young, and not firmly established counterpart organization with two years of assistance from A.I.D. totaling \$250,000 for short-term TA, counterpart salaries, and essential material support.

In fact, much was achieved by ATS over the course of the Sub-project, particularly in information dissemination and networking. The dissemination of information on energy saving opportunities helped develop a fertile ground for a strong demand for the ATS energy equipment and other devices (e.g., growholes). It is most unfortunate that the full benefits of this increased awareness have not been realized, due to the absence of effective response from potential local producers of these devices.

Clearly, success in the information dissemination activities would have full significance only if the supply of the ATS

devices and parts was there to meet the demands thus stimulated. It would have been useful if the Sub-project's design had made allowances for ATS making the devices and parts itself, if necessary. This was explicitly considered and rejected during the mid-term evaluation. In the end, ATS made the best accommodations it could when faced with inadequate response from local artisans -- in some cases making the devices itself (e.g., metal parts for many of the stone stoves), going to larger manufactures (e.g., in the case of the metal stove), or recognizing the need for more time in overcoming bottlenecks for production for some devices (e.g., growholes). In the end, there probably should have been an explicit recognition of the need for a longer-term perspective in private sector development -- with the EIA Sub-project setting out to accomplish what it could, but having fall-back options if major obstacles developed.

#### 4. Need for more information exchange:

-- this Sub-project would have benefited from opportunities for more meetings and other forums for information sharing among EIA sub-projects and other activities throughout Africa.

It would have been useful for the personnel involved in this and other Sub-projects had there been, in 1986 or 1987, a workshop on EIA experiences -- a workshop geared to the interests and needs of the Sub-project counterparts, resident advisors, and Mission energy officers. Such a workshop would have provided the opportunity for counterparts and Mission energy officers to learn more about energy issues and approaches in general and to benefit from the experiences of colleagues in other countries. The potential for networking among the counterparts and Mission officers with responsibility for energy would have been particularly attractive.

## FORMAL STATEMENT OF SUB-PROJECT PURPOSES

As described in the Sub-project description (USAID/Maseru June 1984) the purposes of the Sub-project are to:

- a) develop and strengthen selected dissemination capabilities of the Appropriate Technology Section (ATS) of the Ministry of Cooperatives and Rural Development and the Government of Lesotho (GOL) that are essential to the design, development, testing and demonstration of improved rural technologies;
- b) design, test, and develop effective rural technology dissemination strategies utilizing multi-media resources (e.g., posters, publications, films, etc.);
- c) disseminate and/or market selected improved rural technologies as developed by the ATS under the predecessor RET Project;
- d) develop and strengthen small, and preferably rural entrepreneurial capabilities to produce and market for profit improved rural technologies.

MEETINGS/INTERVIEWS IN LESOTHO MARCH 1988

(USAID/Maseru)

Mulugeta Yohnnes, Mission Engineer

Adrian deGraffenreid, PDO

Jesse Snyder, Mission Director

(ATS)

Makhalaki Nthajane, Ast. Admin. Sec., ATS

Manojalefa Lenono, Head, Dissemination,

Tholo Ernest Khabisi, construction shop supervisor

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E/DI EIA CONSULTANT REPORTS

ON LESOTHO SUB-PROJECT

Judith Gay, Lesotho Household Energy Survey, May 1984

Geoff Burrell, Surveying The Marketing/Production Capabilities of Certain Renewable Energy Technologies By Basuto Small/Medium Scale Enterprises, 1984

Maxwell Kinyanjui, Production and Marketing Strategy for the ATS Stove, May 1985

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Grant Project Agreement Between AID and the Kingdom of Lesotho, "Improved Rural Productivity through Marketing and Dissemination of Energy Technologies, (Lesotho Sub-Project)," Sept., 6, 1984.

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Peat, Marwick, Mitchel & Company (Lesotho), "Progress Report # 2 on the ATS Metal Stove Marketing Study -- Project # 698-0424.32," submitted to R. Draker, USAID/Lesotho, July 16, 1987.