

PDAAZ 322

PROJECT ASSISTANCE COMPLETION REPORT

Bururi Forest Project (691-0105)
(April, 1989)

I. Project Purpose:

To preserve one of the last two natural high altitude tropical forests in Burundi and to develop new sources of firewood and construction timber, the latter to be established through block plantations and emphasis on agroforestry extension to provide an outer buffer zone of trees around the forest to take wood cutting pressure off the forest.

The project's preservation/conservation objective was not merely to save a valuable ecological heritage but also to protect an important watershed and to preserve several indigenous species of plants and birds found only in the Bururi Forest.

II. Project Description:

A. General

The Bururi Forest Project involves protection of a natural forest lying North East of Bururi, the capital of Bururi Province. Situated thus, it enjoys high political visibility and has been classified as a National Forest Reserve. Located about 116 kilometers SSE of Bujumbura, it covers an area of approximately 1400 hectares composed mostly of valuable indigenous virgin timber in a mountainous region with altitudes ranging from 1800 to 2300 meters. The objectives of the project, from a technical point of view, were to: replacing gaps in the forest with local tree species; construct protective fire lanes in and around the forested areas; resettle several families who had begun farming operations inside the forest; and develop a security system composed of forest guards and 30 km of security trails to stop the common practices of unauthorized wood removal from the forest and grazing of livestock in the forest. In addition, the project's aim was to further develop an already existing inner buffer zone which is a band of Black Wattle trees that serves two purposes, one to establish a clear demarcation of the forest boundary and the other being to serve as temporary source of fire/building wood for the surrounding population in order to temporarily take the pressure off the forest. Further, through establishment of block plantations and agroforestry planting totaling approximately 1000 ha, create an outer buffer zone of trees which would eventually provide most of the wood requirements for the people and institutions of the surrounding area. This latter activity, coupled with agroforestry extension activities would also result in creating a conservationist attitude among these same people.

The original design of the project included an activity to introduce the use of a highly efficient wood cookstove to the area people. It planned to put 4000 such stoves into use which would

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reduce area wood requirement by approximately 30%, ultimately reducing the overall estimated wood requirement in the Bururi area from 1700 ha of plantations to roughly 1200 ha. Along these lines, it was also estimated that the then emerging USAID funded Alternative Energy development project (Peat) would eventually result in 60% of the households and institutions using peat for fuel which would further reduce requirement for wood from the forest.

B. Administrative Information

- Project Title: - Bururi Forest
- Project Number: - 695-0105
- Date of Report: - April 1989
- Implementing Agency: - Institut National pour la Conservation de la Nature (INCN) - Director General - André Nipokindi
- Major Contractor: - PASA with USDA - \$305,774
- Field Backstop Officer: - Larry Dominessy: ADO
- AID Backstop Officer: - Archie Hogan - AFR/TR/ARD
- Date of last Evaluation: - Evaluation - July, 1984
Review - January 1987

C. Financial Data (\$000)

- Date of Authorization: - 4/22/82
- Authorized LOP Funding: - \$1,144
- Date of Initial Obligation: - 6/24/82
- PACD: Original: - 4/30/86
- Revised: - 12/31/87 (Full Support)
6/30/88 (For participant training only)
- Cumulative Obligation: - \$1,055.00
- Cumulative Accrued Expenditures: - \$1,045.00
- Cumulative Commitments - \$1,053.60

D. Project Background

The 4 year Bururi Forest Project was designed and approved to assist the Government of the Republic of Burundi (GRB) to improve and increase the forest resource base of the country which was rapidly deteriorating at the time of PID development (Feb, 1980). At the same time, the project addressed one of A.I.D.'s major policy objectives (eg: reducing erosion and increasing alternative energy resources availability to the rural and urban poor). The project was authorized by the assistant AID Administrator for Africa on April 22, 1982. A project grant agreement obligating \$1,144,000 was jointly signed by USAID and GRB on June 24, 1982 and the project became operational with the issuance of the first PIL (Project Implementation Letter) on September 20, 1982.

The project's first in-depth evaluation reported in July, 1984 that the project was essentially on schedule. Major recommendations resulting from the evaluation included: consolidating and expanding the extension effort; establishment of a forest demarcation boundary; increasing forest guards from 3 to 6; dropping the woodstove component of the project; extending the PACD from 12/31/86 to 6/30/87; establishment of a full-time forestry advisor; professional training for Damas Nduwuzani, assistant field staff leader; and that GRS contributions programmed for staff housing be employed instead for staff positions. It was determined in a later review of the project (Jan. 1987), a limited evaluation by a joint AID/W S and T/PS? and REDSO/ESA/AGR Team, that most of the mid-term evaluation recommendations had been realized. The latter team recommended that the PACD be further extended from 6/30/87 to 12/31/87 for full support to provide bridge financing for the project until INCN could submit its 1988 FY GRS financed budget. Conditions to qualify for this extension prior to May 31, 1987 were met by INCN on schedule and included preparation of a 1988 plan of work, 1988 budget submission and a long-term forest management plan. The full extension to 12/31/87 and a limited PACD extension to 6/15/88 were also authorized in March, 1987.

A PASA (USDA/OMDC) was signed Dec. 26, 1982 to provide the services of a part-time forester (4 months in C.Y 83, 2 months each in 84 and 85). His reports are on record. This arrangement was revised in January 1985 following recommendations of the Mid-Term evaluation and a long-term PASA Forester was assigned for a 2 year tour starting 4/27/85 and completed his final report in April 1987.

This report will not attempt to repeat the excellent reports noted here which elaborate on this brief background and are on file in the USAID/S Agricultural Division.

III. Project Status as of June 30, 1988

A. Project Grant Agreement

Under the grant agreement, AID was committed to financing technical assistance, training, commodities/construction and other miscellaneous operational costs for a total of approximately, \$1,144,000. Technical assistance was to consist of 8 person months of short-term forestry advisory services and 14 months of other consultant specialists services as determined over the life of the project. The agreement provided for only a small training component, specifically, a short-term observation tour to India and Kenya. Capital investment support was to include commodities including vehicles, some farm equipment, office equipment, nursery tools/supplies and construction. Construction support was to be limited to a project office and garage/warehouse complex. In addition, the grant included support to establish nursery operations and 1200 hectares of tree plantations in and surrounding the Bururi natural Forest. GRS's contributions were to consist of local currency or in-kind contributions equivalent to US\$220,000 or 16% of the total

project cost. This contribution was to support: permanent project personnel; construction of staff houses; and construction of trails and fire lanes.

B. Project Agreement Amendment

Only one amendment was executed under the project agreement (24 June 1982). Amendment No 1 (1/15/85) provided for a change in the PACD from 6/30/86 to 6/30/87. (In March 1987, AID/W granted a no cost full support extension of the PACD TO 12/31/87 and a limited PACD for training only to 6/30/88. (See State 87- 070131). This amendment also effected the following changes in the agreement: deleted the project cookstove and cookstove extension activity; authorized financing of a long-term forestry advisor; authorized long-term participant training; and revised the implementation schedule and budget.

C. Project Implementation Letters (PILs)

PIL No. 1 confirmed that GRB had met initial Conditions Precedent for disbursement of AID funds, set forth Conditions Precedent for construction disbursement elaborated on in Pro Ag. Article V special provisions, elaborated on AID taxation regulations, and detailed required reports/documentation.

PIL No.2 explained general procedures for utilization of project funding and AID's procurement regulations.

PIL No.3 clarified the procedures for monitoring project revenue and expenditures and procedures for obtaining and replenishing an advance of AID funds.

PIL No.4 proposed procedures to be followed for the financing by USAID of the construction of project office/apartment and garage/storage building complex at Sururi.

PIL No.5 revised local budget expenditures in accordance with Grant Agreement No.1.

PIL No.6. concerned construction and specified INCN responsibility for related water connections and road construction and further appointed a USAID engineering representative to the GRB inspection team as well as detailing specific points of construction still to be completed.

PIL No.7 established conditions/tasks which must be realized by INCN to qualify for PACD extension to 12/31/87 (full) and 6/30/88 (Limited).

PIL No.8 acknowledged that INCN had met conditions set forth in PIL 7 and granted PACD extensions. It also authorized an additional \$53,000 for the 1987 CY project budget.

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D. Planned vs Actual Expenditures:

U.S. Element	LOP Projections (\$000)			Actual*
	Pro.Ag.	PIE No. 8		
01 Technical AssisC.	\$ 131.00	\$ 304.20		\$ 282.50
02 Part. Training	25.00	120.90		100.90
03 Cap. Invest/Constr.	316.40	550.00		516.00
05 Other Costs	458.40	163.90		145.50
06 Contingency/ Inflation	163.20	-		-
Undisbursed	-	-		99.10
Total	1,144.00	1,144.00		1,144.00

* Source MACS Report (3/31/88)-line items adjusted to appropriate elements.

GRS Element	LOP Projections U.S. Equivalent(000)	
	Pro-ag.	Actual
01 Personnel	85.60	66.70
03 Cap. Invest/constr	104.40	0
05 Other Costs	30.00	7.00
Total	220.0	73.70

E. Status of Completion of the Various Project Elements

Element	Status of Completion																
01. Technical Assistance	-100% completed Short-term(3 months)of a U.S. Forestry Advisor for initial years of implementation. 2 years of long-term resident forestry advisor. Short-term, periodic assistance from REDSO/ESA/AGR, Regional Forester and RIA, and AID/W and ST/FAS, and sociological/ecological experts.																
02. Participant Training	- 100% completed.																
	<table border="1"> <thead> <tr> <th>Persons</th> <th>Description of Training</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>-Observation tour (short-term to India, Kenya, Rwanda (1983).</td> </tr> <tr> <td>1</td> <td>-Park management(short-term) U.S.(1984)</td> </tr> <tr> <td>1</td> <td>-ITIA, Nigeria (short term Alley Cropping) 1986</td> </tr> <tr> <td>3</td> <td>-In-country (short-term)- Agr. Chemicals (1986)</td> </tr> <tr> <td>1</td> <td>-In-country (short-term)-grafting (1985)</td> </tr> <tr> <td>1</td> <td>-Wildlife Congress, U.S. (1987)</td> </tr> <tr> <td>1</td> <td>-U.S. (long-term) forestry Science/Agroforestry -(1986 to 1988)</td> </tr> </tbody> </table>	Persons	Description of Training	2	-Observation tour (short-term to India, Kenya, Rwanda (1983).	1	-Park management(short-term) U.S.(1984)	1	-ITIA, Nigeria (short term Alley Cropping) 1986	3	-In-country (short-term)- Agr. Chemicals (1986)	1	-In-country (short-term)-grafting (1985)	1	-Wildlife Congress, U.S. (1987)	1	-U.S. (long-term) forestry Science/Agroforestry -(1986 to 1988)
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03. Commodities/construction. - 100% completed.
 Project center, complete with combination office/living quarters and a garage/warehouse complex, were completed. Commodities supplied included: operational tools, farm tractor and trailer, 3 vehicles, 7 motorcycles, 1 dump truck, and office equipment/furniture and appliances for the long-term forestry advisor.

04. Other Operational Costs-
 100% of requirements completed. Labor and planting materials were supplied to establish 2 project nurseries, 5 community nurseries, 900 hectares of tree plantation within and outside the natural forest, and support of a still on-going agro-forestry program. In addition, office operations and 20 km of forest access roads as well as a security system were maintained.

IV, Review of Project Accomplishments

A. Planned vs Actual Outputs
Planned (PP./Pro-kg)

	<u>Actual</u>	<u>Est % Completion</u>
1. Protection of 1400 Ha of Natural Forest	1. 1400 Ha of natural forest in process of being protected by INCN	90
2. Protection of Malenbwe River headwaters watershed.	2. Completed	100
3. Increased availability of fuel/constr. wood.	3. Ongoing - most trees yet to reach maturity	25

<u>Planned Plantations</u>	<u>Actual Plantations *</u>
- 100 Ha of callitris	- 209.4 ha
- 100 Ha of grevilleia	- -
- 300 ha. of pines	- 324 ha
- 200 ha. of cypressus	- -
- 100 ha. of eucalyptus	- 131.8 ha
- 100 ha. of local species	- -
- 100,000 eucalyptus plants	- -
- Acacia	- 143.78 ha
- Clartier	- 101.26 ha
- Nursery production	- 1,550,000 trees

* See Annex I attached

4. Strengthen institutional Capacity of INCN and Dept. of water and Forests in management.	4. Project objectives reached for INCN DWF not involved	100
5. Develop a conservationist attitude in the Bururi area	5. Ongoing - Long term objective	25
6. Extend the use of fuel efficient wood stoves.	6. Activity officially discontinued in 1984	-

7. Conduct applied research to determine adapted fast growing tree species.	7. Pine and fruit trees identified	100
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B. Project Design Changes/Deviation From Expected Inputs and Outputs

Basically, the original design of the project was changed very little. The project goal and purpose remains the same. Some assumptions originally presumed proved unsound or unfeasible. Foremost among these were:

1. That peat (Alternative Energy Project) development would result in 60% of households utilizing peat as fuel. This did not materialize due to distribution and housewife's preference problems which included out-of-pocket costs for peat as opposed to wood which often is gathered free. Institutions in the Bururi Area, however, did somewhat utilize peat, thus reducing some pressure on the forest. Peat consumed by these institutions amounts to substitution for only 13.9 ha. of trees (or 2500 m³ of wood) over the life of the project.

2. That 4000 families using fuel efficient wood stoves would reduce the demand on fuel wood by 30%. This did not materialize due to myriad logistical problems encountered in the implementation of the wood stove activity. These also included housewives's preference. The problems were recognized by the 1984 evaluation team which recommended abandonment of this activity. INCN actually made the final decision.

3. It was assumed in the original design that a part-time US. Forestry advisor working 2 months per year could effectively satisfy technical assistance requirements. This arrangement was found to be inadequate and the problem was solved in April 1985 by assigning a long-term (2 year) forestry advisor;

4. The original design contained a minimum of training support, presumably because the authors of the PID and PP relied too heavily on the supposition that the Dept. of Water and Forests contained a wealth of resource people skilled in management/forestry from which to draw upon. By the time the Project Agreement was written, the project had been designated as coming under the administrative management of INCN, (Institute National pour la Conservation de la Nature), a young institution, directly under the Office of the President inexperienced in both forestry and forestry management. As a result, training support to the project was augmented to include long term U.S. training, the first participant of which completed his B.S. in Forestry/Agroforestry just prior to the limited PACD of June 30, 1988.

5. The original project design assumed that 1200 hectares of plantation in and outside the natural forest would be required to fill in forest gaps and to provide a buffer of trees to preclude encroachment on the natural forest itself. As a result of careful planning, according to Ed Olson, part-time forestry advisor, in December 1984, the original 1200 hectares of block plantation requirement was reduced to 800 hectares.

6. The first PAC D established for the project was June 30, 1986. The 1986 evaluation team recommended that this be extended to June 30, 1987 in order to allow inclusion of 4 full planting seasons and to begin the extension of agroforestry work (84/85). The PACD was further extended to 12/31/87 and to 6/30/88 (limited) as previously explained.

7. Originally it was planned that GRB (INCN) construct 3 houses in the project area for GRB project personnel. The 1984 evaluation team did not feel that these houses were necessary and proposed that the funds be used to support personnel instead.

V. Project Progress Toward Achievement of Project Purpose:

The basic purpose, that of protecting 1400 hectares of natural high altitude forest has been 90% achieved; however, it must be realized that this protection has come somewhat at the expense of those households surrounding the forest which normally supplied their firewood and building needs from the forest. With a strict forest security policy in force, these people must get their wood elsewhere. This, of course, is directly related to the secondary purpose of the project which is to provide a source of fuel and building materials outside the natural forest boundaries. While approximately 800 hectares have been planted inside and outside the natural forest through boundary, block and agroforestry plantations, it will take another 9-10 years of growth before these trees will provide significant amounts of wood. Coupled with this is the need for continuous replanting to replace trees in areas where violations have and are occurring and in areas after trees have been systematically harvested. Here the agroforestry activity plays an important key role. Continued success of the Bururi Forest Project depends largely on continuation and further expansion of this activity. Ultimate realization of a 3 km wide outer buffer zone of plantings outside the forest borders will take almost all wood poaching pressure off the natural forest. This aspect of the project purpose cannot be realized in the short-term and its realization in the long term will only come about if GRB/INCN continue dedication/funding toward its achievement.

VI. Project Design

The Project design and funding have basically remained unchanged with exceptions as noted in section IV above. Since this project is not earmarked for continuing USAID funding assistance, there are no design changes contemplated. If the original design were to be faulted, it would be that not enough early-on emphasis was placed on:

- providing long term advisory assistance for the LCP;
- providing for professional forestry and forestry management training;
- Expansion of funding for agroforestry extension activities.

VII. Post Project USAID Involvement

A. Indirect Involvement

Completion of USAID funding has resulted in more careful management by INCN of resources made available to it by the GRB. The overall effect is that INCN has adjusted its management to take full responsibility for project activities.

USAID will have no direct continuing involvement in the Bururi Forest Project as such but will cooperate fully with Peace Corps as it continues its involvement in the Bururi Forest and other natural regions under INCN's management through the Peace Corps "Biological Diversity (National Parks Development) Project as it becomes established. At the time of this report, USAID/Burundi awaits AID/Washington's decision as to the type of administrative arrangement to be made between AID and Peace Corps for implementation of the project and allocation of funds.

USAID/Burundi will continue to look to Peace Corps to play major roles in any future mission biological diversity/conservation activities, in concert with regional activities of the World Wildlife Fund, ICRAP, and the REDSO/ESA Regional Forestry Advisor. USAID will also continue to cooperate to the extent possible on follow-up of the activities of Peace Corps Volunteers currently associated with the Bururi Forest, specifically a professional wildlife biologist and a specialist in extension audio visual aids.

B. Direct Involvement

An ex-post facto review of the status of the project should be held 2 years after the end of AID financed activities to inspect the growth of the trees and other long-term project effects.

VIII. Project Data Analysis

This project has not been subject to many formal studies. One such formal study was completed in October of 1983 entitled "Socio-Ecological survey of the Bururi Forest Project Area" by A.W. Webber and A. Vedder.

To summarize this report, which is statistically supported in detail, it is best to quote its conclusions as follows:

"The Bururi Forest plays an important role in the lives of project area inhabitants. It is used as a communications link between the eastern and western hills for people, produce and cattle; it provides building materials and medicinal plants for a majority of households; and at least one-fourth of the population considers it a major source of firewood. While people attribute considerable value to these forest products, they are far less aware of forest services and their values.

Non-consumptive benefits of forest conservation such as watershed protection and hydrological regulation are largely unrecognized or greatly devalued. This poses problems for the natural forest protection component of the project, in that it will enhance the value of ecological services while limiting the direct exploitation of forest products.

The reforestation component of the project is intended to increase the supply of many of these forest products, and the potential value of this is widely recognized by the population. Nevertheless, many people are concerned that losses of traditional pasture lands and possible displacements from prime agricultural land will represent costs that offset or even surpass potential benefits. At the same time, large majorities in all areas question whether they will have full access to plantation resources under government rather than private control.

Despite the above, popular reaction to the project is generally positive, with three-fourths of those sampled feeling that the joint INON/USAID effort will benefit the Province of Bururi. This represents a solid base for the project to build upon, although three important qualifications to this support must be recognized. First, the project is poorly understood by the local population. As it is implemented over the coming years, negative reaction could increase unless an effort is made to both increase understanding and decrease potential impacts of various project actions. Second, important regional differences are masked by the overall findings of support. In particular, residents of the western hills of Rukanda and Mubuga view the project in considerably more negative terms than do others. The farmer-herders of Murego are also likely to react more negatively as they see their traditional grazing lands reforested over the coming year. Finally, the apparent popular support for the project must be qualified by a recognition of the fact that the local population views its benefits in different terms than do those who conceived and now manage the project. With regard to the natural forest, they see products rather than services; with regard to plantations, they are more inclined to look for personal rather than communal benefits. These perceptions are not antithetical, but they do hold the potential for serious future conflicts.

The development of a management plan which takes the above findings into consideration could considerably reduce the potential for conflict. In particular, such a plan should allow for the continued traditional uses of the forest (trails, lianes, medicines) which prove to have no significant negative impact on forest ecology. It should also move away from the block plantation approach to more flexible reforestation programs, especially in the western sector. Agro-forestry combinations and other on-farm planting approaches are most applicable in areas of high human concentrations on land suitable for cultivation. The advantages, besides fewer displacements, include decentralized control over wood resources and increased emphasis on firewood species. This approach should also be accompanied by a major extension component to both disseminate technical advice and better inform the population of project activities. Finally, a more general conservation education program is required if people are to be made more aware of the values of natural resources that they are being asked to help preserve."

As concerns the development of a forest management plan, this was accomplished (much too late) in late 1987 and as a result of conditions laid down as a prerequisite for qualifying for a full support extension of the PACD to Dec 31, 1987. This plan is currently being expanded and refined by P.C.V. Paul Cowles.

While the Webber - Vedder study examined both the flora and fauna content of the forest another formal survey of the wildlife, content of the forest is currently underway under the auspices of the Peace Corps. The study was begun in 1986 by P.C.V. Tim Rach and was completed by P.C.V. Paul Cowles in September 1988.

An informal study was conducted in 1984 by P.C.V. Rob Clausen to determine the attitudes of the surrounding population toward the Bururi Forest Project. The survey showed that 50% were for the project and its objectives and 50% against. Their major fears were: possible displacement, reduced pasture availability, cut off of a source of building poles and wood, and shortage of alternative land for planting trees. Conclusions of the survey were: that practically everyone is aware of the illegality of cutting trees in the forest, aware of the project, and trying to hide violations committed in the forest.

IX. Current Situation Analysis

It is quite significant that INCN's request to the GRB for 40 million FBu for its 1988 operations was cut by 75% or to 10 million FBu. The amount requested was to have supported all of INCN's operations which cover not only the Bururi National Forest Reserve but all other national parks as well. Bururi Forest's share of the 10 million FBu amounts to 4 million FBu. The project paper estimated that the project would only have recurrent costs amounting to a maximum of 3.6 FBu./year immediately following completion

of assistance. This amount will undoubtedly fall short of needs. For example, INCN's projections for minimal requirements for the next 3 year period (1989 through 1991) are as follows :

<u>Activity</u>	<u>Target</u>	<u>Cost (000 FBu/year)</u>
- Personnel(full time)	15 persons	4,000
- Tree Pruning	300 Ha/yr	1,290
- Trail/firebreak construction and maintenance	20 km/yr	1,000
- vehicle maintenance and P.O.L		1,300
- 3 tree nurseries for agro-forestry extension	100,000 plants	1,200
- Total		10,700

It is to be noted that this projection amounts to an average requirement of 10,700,000 FBu/year. Also to be noted is the fact that these are minimal estimates and do not take into account expansion of agroforestry extension or forestry security operations. Since the assumed alternative energy source (Paat) and the planned wood saving scove activity which was dropped from the project failed to produce the projected energy savings, the pressure on the forest (wood poaching) is and will continue to be greater than the Project Paper envisioned. For these reasons, the original estimate of a need for 1,000 ha of total plantings outside the forest to provide for the building and fuel-wood requirements of the Bururi area seems to be closer to the reality of the situation. Only through increasing and tightening up on forest security and accelerating agroforestry activities can this effort to preserve the Bururi National Forest Reserve be kept from backsliding.

Of the four project nurseries established, only one is operating at the present time and at a reduced capacity of 40,000 seedlings. This is enough to replace existing forest stands but not enough to support an agroforestry operation. Of the 1,050,000 seedlings produced by project nurseries during the life of the Project, 184,000 were distributed for agroforestry or other private plantings outside the natural forest boundaries. Concerning forest boundaries, it is safe to conclude that original estimates of total hectares involved were in error. Noted in Annex 1 attached are the exact areas of the different plantations, natural forest, and areas unplanted. These areas/plantations were obtained in late 1987 after the completion of a detailed map financed by USAID through the project. It is interesting to note that the total area now considered as an integral part of the Bururi National Forest Reserve amounts to 3,338.5 hectares. This, of course comprises natural forest, unplanted and planted areas. At the time of this report, INCN considers all of this area as part of the protected Bururi National Forest Reserve. While not the original intent of the project, it must be admitted that this situation minimizes wood poaching from the natural forest itself if not from the plantings surrounding the natural forest but now considered a part of it.

Also noted is that of the original 30 km of forest trails constructed/maintained, only approximately 4 kilometers are still maintained, the rest having grown over. This reduces the mobility of the 9 forest guards still remaining on the project to patrol the area efficiently.

A tourist center/guest house has been constructed with USAID support at the top of the mountain in the heart of the natural forest and now serves as a focal point from which tourist's interests can be served.

During the life of the project (L.O.P), 1162 families outside the forest have received trees from the project. At one point in 1987, 5 communal nurseries, managed by local communities, were in operation and receiving technical assistance from project personnel. At this time, all have ceased operation.

The current management personnel situation of INCN and the project has changed. Mr Audace Kabayanda who served as INCN Director General from the project's conception, was replaced in late 1987 by his former Deputy, Mr André Niyokindi. In addition, Mr Thomas Mabacumba, Project Manager since the early stage of project implementation was reassigned in late 1987. He was replaced by André Ndikuriyo who had initiated and implemented the agroforestry activity of the Project. His appointment as the Bururi Forest Project Manager had the effect of spreading his capabilities rather thinly. In addition, He was assigned a responsibility for forest conservation for the entire Bururi Province. The net effect has been the discouragement of agroforestry activities around the perimeters of the Bururi National Forest Reserve. In total, the personnel losses to the project have weakened INCN Management and the conservation/preservation effort at the Bururi Forest level even though the overall net effect of the project has resulted in a stronger INCN capability to cope with management problems of projects such as Bururi Forest.

A positive achievement, indicating GRB moral if not financial support to the Bururi National Forest, is the recent passing by the council of ministers and issuance of decree No. 1-18 by the President of the Republic on 6/24/88 which effectively makes Burundi a member of the Convention of International Trade in Endangered species. The decree's objective is to control commercial exploitation relating to species of flora and fauna facing extinction in Burundi's remaining forests.

X. Lessons Learned

1. The Project Paper envisioned that the Department of Water and Forests (DWF) would be the GRB project implementing agency. By the time the Project Grant Agreement was signed, the implementing responsibility had shifted to INCN, a young organization directly under the Office of the President. The INCN, in contrast to DWF, lacked experience and management capability. At the time that this change was effected, project inputs should have reflected more support in technical assistance and long and short term training in forest management.

2. The forest management plan developed in late 1987 should have been developed in the early stage of project implementation and closely followed throughout the life of the project. Observed necessary adjustments to the plan could have been made as management experience was accumulated.

3. Assumptions that the USAID supported peat and woodburning stove activities would significantly reduce energy demands on the forest were proved to be unrealistic. At the time this was realized, expected project outputs should have been adjusted accordingly.

4. Early in the Project, increased coordination by INCN with regional and international organizations with experience in conservation/preservation of forests would have accelerated the Bururi Forest learning process.

ANNEXE I

TYPES OF DIFFERENT PARCELS AND THEIR AREAS

A. South Side

1. <u>Primary Forest</u>	776ha 11a 50ca
2. <u>Acacia (AC)</u>	
AC 1	272,500m ²
AC 2	82,500m ²
AC 3	219,375m ²
AC 4	141,750m ²
	<u>716,125m²</u> = 71ha 61a 25ca
3. <u>Pinus (Pn)</u>	
Pn 1	16,250m ²
Pn 2	7,000m ²
Pn 3	7,500m ²
Pn 4	60,375m ²
	<u>91,125m²</u>
4. <u>Callitris (Cal)</u>	
Cal 1	1,167,917m ²
Cal 2	63,750m ²
Cal 3	113,125m ²
Cal 4	32,750m ²
	<u>1,377,542m²</u> = 137ha 75a 42ca
5. <u>Non-wooded zone</u>	177ha 43a 00ca
6. <u>Clariere (Cl)</u>	
Cl 1	68,750m ²
Cl 2	196,625m ²
Cl 3	168,750m ²
Cl 4	177,500m ²
Cl 5	6,375m ²
Cl 6	143,000m ²
Cl 7	65,417m ²
Cl 8	126,000m ²
	<u>952,417m²</u> = 95ha 24a 17ca
7. <u>Eucalyptus (Euc)</u>	
Euc 1	365,000m ²
Euc 2	141,750m ²
	<u>506,750m²</u> = 50ha 67a 50ca
<u>TOTAL AREA OF THE SOUTH SIDE:</u>	1,317ha 90a 09ca

B. North Side

1. Primary Forest		1,199ha 63a 13ca
2. <u>Acacia (Ac)</u>		
Ac 1	285,750m ²	
Ac 2	336,750m ²	
Ac 3	15,750m ²	
Ac 4	<u>83,500m²</u>	
	721,750m ²	
3. <u>Pinus (Pn.)</u>		
Pn.1	369,125 m ²	
Pn.2	710,875 m ²	
Pn.3	217,625 m ²	
Pn.4	626,500 m ²	
Pn.5	95,750 m ²	
Pn.6	567,250 m ²	
Pn.7	246,875 m ²	
Pn.8	<u>67,500 m²</u>	
	3,148,375 m ²	- 314 ha 83 a 75 ca
4. <u>Callitris (Cal.)</u>		
Cal. 1	91,500 m ²	
Cal. 2	327,750 m ²	
Cal.3	87,000 m ²	
Cal.4	<u>210,375 m²</u>	
	716,625 m ²	- 71 ha 66 a 25 ca
5. <u>Non-wooded zone</u>		2.962.000 m ² - 296 ha 20 a 50 ca
6. <u>Clariere</u>		
Cl. 1	32.750 m ²	
Cl.	<u>27.500 m²</u>	
	60.250 m ²	- 6 ha 02 a 50 ca
7. <u>Eucalyptus (Euc.)</u>		
Euc.1	17,125 m ²	
Euc.2	611,375 m ²	
Euc.3	39,637 m ²	
Euc.4	<u>48,500 m²</u>	
	716,637 m ²	- 71 ha 68 a 37 ca
Private Eucalyptus	94,500 m ²	- 9 ha 45 a 00 ca
8. TOTAL AREA NORTH:		2020 ha 61 a 25 ca

SUMMARY

1. MASSIF	1,975 ha 74 a 63 ca
2. ACACIA	143 ha 78 a 75 ca
3. PINUS	317 ha 20 a 00 ca
4. CALLITRUS	188 ha 37 a 92 ca
5. ZONE NON WOODED	485 ha 68 a 00 ca
6. CLARIERE	101 ha 26 a 57 ca
7. EUCALYPTUS	<u>126 ha 92 a 37 ca</u>
TOTAL AREA (F.N + F.S)	3,338 ha 55 a 34 ca

ANNEXE II

Explanatory Note on the Enrichment and Conservation
of the Bururi Forest Project

1. Introduction:

The project of the Enrichment and Conservation of the Bururi Forest results from the agreement of the Grant between the Government of Burundi and the United States Government with Agency for International Development USAID acting as the intermediary (Project no. 695-0105).

The project goals were to:

- Conserve the Bururi Forest,
- Develop new sources of firewood and construction wood for the Bururi region.

In the agreement document, the finances from USAID were fixed at a maximum of \$1,144,000 that could be distributed in local currency when the Burundi Government gives an equivalent of \$220,000.

The project began in 1982-83 and finished December 31, 1987.

2. Accomplishments:

Most of the objectives were completed as fixed such as:

- Forest protection, a team of guards were placed to protect the forest and the surrounding population was sensitized to the value of protecting the forest.
- 774ha of exotic plantations for pruning and clearing were planted on degraded soil.
- 100ha of local species were planted.
- An office building and storerooms were built in Bururi.
- A guest cabin was built in the forest for tourists and visitors.
- Lists of existing wildlife and flora, including medicinal plant uses were constructed.

Chimpanzee movement and protection in the forest was of particular interest.

It was necessary to install a conservation attitude in the local population, therefore an agroforestry extension program was initiated. This program addressed the communities, schools, military posts, the prison and the church. It helped these people to start using agroforestry species in their fields as well as initiate their own private woodlots.

ANNEXE II

The following table shows the number of trees produced and distributed since the beginning of the project:

Season	Total Production	Planted by INCN	Plants distributed	Direct planting by INCN
1982-83	15,000			
1983-84	696,000	442,000	15,000	
1984-85	416,000	281,000	33,000	
1985-86	77,000	10,000	56,000	20 km
1986-87	40,000	1,900	30,000	
	<u>1,244,000</u>	<u>734,900</u>	<u>184,000</u>	

In agroforestry the project was able to identify some exotic tree species that fix nitrogen and are capable of adapting to the region such as; Calliandra calothyrsus, Acacia melanoxylon, Mimosa scabrella, Grevillea sp., and Acrocarpus fraxinifolius, those that do not have nitrogen fixing capabilities adapt well to agroforestry techniques.

The same experiments were done using local species, these results were not good since most local species showed slow growth rates except for Dodonea viscosa.

To accomplish the work, USAID equipped the project with the necessary materials which, at the end of the project, were turned over to the INCN. These materials included; transportation, a generator, and other various equipment. It is without a doubt that this equipment will be very valuable to the INCN after the project has finished.

3. Supervising Personnel:

Along with general supervision and administrative help by USAID it is necessary to mention these key people that have worked on this project:

- Mr. Ed Olson 1982-84: Consultant USAID.
- Mr. LeRoy Duvall 1985-87: Consultant USAID.
- Mr. Robert Clausen 1984-86: Peace Corps Volunteer.
- Mr. Tim Rach 1986: Peace Corps Volunteer.
- Mr. Paul Cowles 1986-1987: Peace Corps Volunteer.
- Mr. Thomas Nabacumba: National Responsible for the Project.
- Mr. Andre Ndikuriyo: Responsible for R.N.F. of Bururi and Makamba.

4. Training:

The personnel associated with the project have benefited from many different types of formation including formal and non-structured.

In 1983 the National responsible made visits to agroforestry projects in Kenya and in Rwanda.

In 1984 the DG of the INCN participated in a two week seminaire in the United States on the management of National Parks.

- In 1985 Mr. Damas Nduwumwami finished his forestry studies at Steven's Point, Wisconsin in June 1985.
- In 1985 Mr. André Ndikuriyo participated in a three week agroforestry training at IITA in ABADAN.

The personnel also participated in various trainings in Burundi along with the training outside the country.

5. End of Project:

The end of the project since December 1987 put the INCN in a difficult financial situation. If today we take responsibility of supervising and forest guards in Bururi we will not have the means to promise the recurring costs such as;

- Maintenance of the present plantations,
 - pruning,
 - clearing,
 - fire breaks and paths.
- Agroforestry Extension
- Faunal and Floral research.

The minimal recurrent charges during the three years are as follows:

Supervising Personnel and	Indicator	FBu/year
Guards	15 units	4,000,000
Pruning and Clearing	300ha/year	1,200,000
Creating and maintenance of paths and fire breaks	20km/yr	2,000,000
Maintenance and fuel for the fleet		2,300,000
3 Nurseries for Agroforestry	100,000plants/year	1,200,000
Extension		10,700,000

These expenses should be taken up by the national budget in 1988 if we want to impress the importance of these natural resources.

