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APPENDIX 3A 124

AGENCY FOR INTERNATIONAL DEVELOPMENT

PROJECT DATA SHEET

1. TRANSACTION CODE: A (A = Add, C = Change, D = Delete) — Amendment Number — DOCUMENT CODE: 3

2. COUNTRY/ENTITY: Burundi

3. PROJECT NUMBER: 695-0105

4. BUREAU/OFFICE: Africa 06

5. PROJECT TITLE (maximum 40 characters): BURURI FOREST (see block 13)

6. PROJECT ASSISTANCE COMPLETION DATE (PACD): MM 12 DD 31 YY 84

7. ESTIMATED DATE OF OBLIGATION (Under "B." below, enter 1, 2, 3, or 4): A. Initial FY 81 B. Quarter 3 C. Final FY 85

8. COSTS ($000 OR EQUIVALENT $1 =)

A. FUNDING SOURCE	FIRST FY 81 B. FX	C. L/C	D. Total	LIFE OF PROJECT E. FX	F. L/C	G. Total
AID Appropriated Total	52,080	362,620	414,700	157,080	986,920	1,144
(Grant)	(52,080)	(362,620)	(414,700)	(157,080)	(986,920)	(1,144)
(Loan)	( )	( )	( )	( )	( )	( )
Other U.S. 1.						
Other U.S. 2.						
Host Country		95	95		220	220
Other Donor(s)						
TOTALS	52,080	414,795	414,795	157,080	987,140	1,364

9. SCHEDULE OF AID FUNDING ($000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	C. PRIMARY TECH. CODE 1. Grant	2. Loan	D. OBLIGATIONS TO DATE 1. Grant	2. Loan	E. AMOUNT APPROVED THIS ACTION 1. Grant	2. Loan	F. LIFE OF PROJECT 1. Grant	2. Loan
(1)	743					500		1,144	
(2)									
(3)									
(4)									
TOTALS									

10. SECONDARY TECHNICAL CODES (maximum 6 codes of 3 positions each)

11. SECONDARY PURPOSE CODE

12. SPECIAL CONCERNS CODES (maximum 7 codes of 4 positions each)

A. Code

B. Amount

13. PROJECT PURPOSE (maximum 480 characters)

1. To preserve one of the last two remaining natural high altitude forests in Burundi (Bururi Forest)
2. To develop new sources of firewood and construction timber for the inhabitants of the Bururi area. (This project was formerly known as "Agricultural Land Protection").

14. SCHEDULED EVALUATIONS: Interim MM 01 YY 83 MM 04 YY 84 Final MM 11 YY 87

15. SOURCE/ORIGIN OF GOODS AND SERVICES: ☐ 000 ☐ 941 ☒ Local ☒ Other (Specify) 935

16. AMENDMENTS/NATURE OF CHANGE PROPOSED (This is page 1 of a _____ page PP Amendment)

17. APPROVED BY — Signature — T. L. Lambacher — Title: AID Affairs Officer — Date Signed: MM 12 DD 16 YY 80

18. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION: MM DD YY

AID 1330-4 (8-79)

INDEX

I. BACKGROUND

A. Burundi's Disappearing Forests: The Wood Production Problem

Burundi is a small, landlocked country in East-Central Africa whose population of about 4.1 million people are crowded into an area of about 28,000 square kilometers, no larger than the state of Maryland. About 95 percent of the population live in rural areas. Burundi has one of the highest population densities in Africa. The resulting pressure on the land is manifest in several ways -- small farmsteads averaging half a hectare per family in the more densely crowded regions, cultivation of marginal land with slopes of forty-five degrees and more, and the rapid disappearance of the remaining forest and woodlands.

Estimates of Burundi's total forest resources vary somewhat, but all experts agree that the number of hectares of forest is declining year by year. Even with current Government of the Republic of Burundi (GRB) reforestation programs, it is estimated that tree cover will be reduced to 40 percent of present levels by 1986, since it takes five to eight years for a tree to reach exploitable size. The November 1979 PID for this project used the figure of 134,000 hectares remaining in forest (slightly less than five percent of Burundi's total area). This figure was derived from the French-financed study by Bertrand in 1978. However, in its 1979 Forestry Project Appraisal Report the World Bank estimated Burundi's total forests at 90,000 hectares or three percent of the country's total area. The IBRD estimated that the forest consisted of 40,000 hectares of tropical highland forest along the Zaire/Nile Crest, 20,000 hectares of savannah woodlands, 25,000 hectares of existing forest plantations, and the remaining 5,000 hectares in new plantations. In late January 1981, the GRB re-estimated total forest cover at 88,000 hectares.

Wood consumption, however, runs high. The heaviest use of wood is as fuel, for cooking and heating in rural areas, cooking in the towns and use in light industry and by institutions. The second largest use of wood is for construction and house repair. Estimates of wood consumption vary from two "steres" 1/per person in the Bertrand report to 0.5 stere per person according to the IBRD. While it is clear that wood

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1/ Fuelwood consumption is often measured in steres. One stere is equal to one cubic meter of stacked logs by volume (with air spaces in between) but not by weight. Construction wood is normally measured in cubic meters, i.e. solid planks rather than round logs. The weight equivalent of 1.00 stere is 0.6 cubic meters of solid wood.

consumption has not yet been measured accurately, on the basis of actual requirements and availbilities, indications are that the lower figure is probably more accurate (See Section III/C, Economic Analysis).

Even if the lower wood consumption figure is accepted, ecologists are deeply concerned about its implications and have pointed out that if corrective action is not taken, Burundi's remaining forests will disappear entirely in another decade or less. This would be disastrous not only to the rural population who depend on wood for fuel but also to the ecology of the land itself. Without the protection supplied by forest and woodlands in the form of ground cover, soil erosion will accelerate as will degeneration of the watershed and acceleration of stream run-off. In addition, an irreplaceable gene pool of plants and wildlife will be destroyed.

B. ISSUES RAISED IN PID REVIEW

A number of issues were raised in the AID/Washington PID Review (See Annex D). The Project Design Team addressed and resolved all these issues, and the conclusions are set forth in the relevant sections of the PP itself.

Under technical feasibility, the PP addresses the issue of consideratic of tree species, control of weedy plants by grazing and intercropping, prevention of poaching and extension work with farmers. Under administrative feasibility, the PP answers questions regarding the ability of the GRB Department of Water and Forests to deal with the project, examining technical assistance in light of GRB capabilities, and the availbility of local labor. Both the financial and socio-cultural analyses deal with the determination as to whether the seedlings may be sold at full price to the farmers as firewood was previously free. The socio-cultural analysis also discusses the concept of wood purchases, income producing activities and women's roles and attitudes. The financial section contains the determination as to who should pay labor costs and the need for a waiver of Section 110 (a) due to the fact that the GRB is contributing less than 25 percent of the project costs. (See Annex E with draft project authorization and action memoranda).

II. PROJECT DESCRIPTION

A. GOAL AND PURPOSE

1. Goal

The goal towards which the Bururi Forest project contributes is to "assist the GRB to improve and increase Burundi's forest resource base".

Key assumptions in reaching the goal are that:

-- The GRB will continue its policy of preserving the country's forests and developing new forest resources; and

-- Other donors with forestry programs will continue to support GRB forestry policies and programs.

a. The GRB's Forestry Policy and Programs

The Government of the Republic of Burundi (GRB) has recognized the seriousness of its forestry resource problem and has faced it as rationally as possible. Both the Second Five Year Plan (1973-1977) and Third Five Year Plan (1978-1982) list an improved forestry sector as one of their goals, along with improved soil and water conservation. The GRB declared that 1979 was the "Year of the Tree" and conducted quite an extensive publicity campaign regarding forestry resources. The GRB then declared 1980 as the "Year of Soil Conservation".

GRB's targets within the forestry sector include:

-- Planting up to 240,000 hectares of new plantations of fast growing species as quickly as possible. These plantations will meet the demand for poles and construction wood, most urban fuel requirements (assuming increased use of peat in urban areas), and rural firewood needs in areas surrounding the plantations;

-- Encouraging farmers to plant trees on their homesteads to supply family requirements by distributing seedlings, and providing extension services, as well as developing communal forests for the same ends.

-- Preserving the small remnants of native forest.

The GRB has successfully organized and launched projects to meet these new objectives during the past few years. The pace of plantation establishment should increase to 5,000 hectares annually in a few years, assisted by several major foreign assistance projects. The annual target includes 2,000 hectares of production forest, 2,000 hectares for firewood and 1,000 hectares for saw timber production. The GRB should reach its goal of 240,000 hectares in 25 to 30 years if this annual planting rate is sustained. However, many of these programs are aimed at increasing saw timber production, rather than improving firewood availabilities in rural areas.

Assuming a conservative average yield of 10 cubic meters per year from these new forests, wood production will increase by 200,000 cubic meters by year 10 and 800,000 cubic meters by year twenty. While this is sufficient to meet all of Burundi's construction needs, the national need for firewood is about 1,230,000 cubic meters. The new plantations currently being established will make only a small direct contribution to meeting the national firewood requirement.

Consequently, GRB has encouraged tree planting by private individuals on their own land, the establishment of new communal forests, and the rejuvenation of approximately 25,000 hectares of old communal eucalyptus plantations. The Department of Water and Forests ("Eaux et Forêts") 1/ has initiated a modest program using its own resources to cover several hundred hectares per year. The IBRD forestry project, which begins this year, represents a major increase because it will place small eucalyptus nurseries in 30 of the 79 communes in the country. Seedlings will be sold at cost ($.04 per tree) to individual farmers and communities. An associated extension effort will encourage private planting as well as train farmers in tree planting and growing techniques

Thus, the long term answer to the rural population's fire-wood needs will be local plantations grown and harvested by individuals and small groups.

b. Other Donor Assistance to GRB Forestry Projects

(1) The most ambitious program is a five-year $8.8 million project begun in mid-1979 under the auspices of the World Bank. It includes an International Development Association (IDA) loan of $4.3 million, a $1.86 million grant from French technical assistance (FAC), $0.7 million from the United Nations Development Program (UNDP) for training, and $1.2 million from the European Economic Community's Special Action Account. The GRB will provide $770,000 in local costs. The project will include:

(a) Establishing of two plantations - 5,000 hectares of pine in the south and 2,000 hectares of eucalyptus in the north;

(b) Establishing 30 nurseries at the commune level throughout the country;

(c) Providing technical assistance to the Department of Water and Forests (five expatriate staff members); and

(d) Financing of research and studies on energy needs and sources, including new techniques for charcoal production and developing new designs for cooking stoves.

1/ This Department, located within the Ministry of Agriculture and Livestock, will be the implementing agency for this project. It is referred to as DWF throughout the PP.

(2) In 1978, the European Development Fund (FED) began developing a 3,200 hectare plantation north of Bujumbura. Under the guidance of two Belgian and three Burundian Foresters, over one million pine trees have been planted on 847 hectares (60 percent in Pinus patula and 40 percent in Pinus caribea hondurensis). Project implementation is on schedule.

(3) Belgium and Saudi Arabia finance a 12,000 hectare plantation, which was begun in 1978. It will grow pine, eucalyptus and Callitris in center south Burundi.

(4) Other related activities include a French forestry research program, as well as a UNDP/Food and Agriculture Organization (FAO) training program that will train 18 foresters and 85 forestry technicians over three years.

2. The Proposed USG Response: Selection of the Bururi Forest Projec

The 1982 CDSS concentrates U.S. assistance on helping the rural population cope with a deteriorating environment and solving the dilemma of population pressure on land. In this context, alternative energy (both wood and peat) and soil conservation/protection are extremely important in preventing further deterioration of land used in food crop production. One of the three "strategy objectives" set forth in the Burundi FY 1983 CDSS is to "reduce the rate of loss of arable land to soil erosion and increase the availability of alternative energy sources to the rural and urban poor". Soil conservation, afforestation and energy use are all interrelated in Burundi. AID has an advantage in providing certain types of assistance in this sector in that it can draw upon the US's considerable forestry and conservation expertise and AAO/Burundi has also conducted several small scale investigations of rural attitudes toward fuel and firewood.

AAO/Burundi's projects to meet these strategy objectives are in two areas: afforestation and the use of peat as an alternative source of energy. The Bururi Forest project, presented in this paper, aims at combining preservation of a small remnant of highland forest with testing and extension of improved, more fuel efficient rural cookstoves. AAO has taken the lead in the past two years in helping develop Burundi's peat reserves, since peat is the one available fuel that will give time to permit the afforestation projects to mature. The Alternative Energy: Peat II project signed in 1980 should result in peat replacing wood and charcoal in 60 percent of Bujumbura's households, as well as using it for light industry and institutions.

As was mentioned in the PID for this project, AID considered a general reforestation project that would being in FY 1980, but in light of the major forestry projects assisted by other donors, it was deemed unwise for AID to introduce still another general forestry project

because it would tend to overtax the absorbtive capacity of the DWF and would have a relatively small marginal impact in this already crowded field. AID/Burundi then turned its attention to another specific GRB request for assistance to preserve one of the last two remaining high altitude forests in Burundi, the Bururi Forest, and to provide increased wood production in the Bururi area through a local reforestation program. The PID team examined the project idea in November 1979 and concluded that the project had merit, was technically feasible and within the managerial capability of the DWF. Since the Bururi Forest project's objectives were not addressed by any of the other donor forestry projects in Burundi, no duplication of efforts would be involved.

3. Project Purpose

The purpose of the Bururi Forest Project is to preserve one of the last two natural high altitude tropical forests in Burundi, and to develop new sources of firewood and construction timber in the Bururi area. It should be noted that the most important factor endangering the Bururi Forest is the lack of sufficient fuelwood in the area to meet the needs of the rural population, the inhabitants of Bururi town and the requirements of local institutions.

The End of Project Status indicators are that conditions have been achieved which favor the preservation of the Bururi Forest. These include the establishment of 1,200 hectares of plantations around the forest (of which 100 hectares will be local species replanted in clearings in the forest), seedling nursery in full operation, and an additional production of eucalyptus seedlings for planting 300 hectares private and communal woodlots. Details on types of plantings and timing are contained in the Technical Feasibility section.

Achievement of the project purpose rests on assumptions that:

- Bururi Province Government officials will support efforts to preserve the forest and will enforce anti-poaching laws;
- GRB estimates of wood requirements and current sources of wood in the Bururi area are essentially accurate;
- Planting mix proposed in project is for maximum production of wood in minimim time and acreage.

B. BENEFICIARIES AND THE ROLE OF WOMEN

This section of the Project Paper discusses benefits, direct and indirect, resulting from the Bururi Forest Project. The population that benefits from the project is estimated at about 28,400 at present, includes the estimated 26,000 rural dwellers that live close enough to the forest and the protective belt to use the wood grown there plus about 500 people living in Bururi "town". In addition, the two educational institutions, with enrollments of 488 and 388 students, and the 1,000 man army encampment will benefit from the project in a lesser degree.

Using conservative calculations, the internal rate of return for the directly productive portions of the project is a minimum of 10.26 percent in terms of domestic market prices, which is favorable when compared with data from IBRD's plantations containing productive pine and eucalyptus only.

1. Direct Benefits (Quantifiable)

a. Value of Wood Produced under this Project

The Project will provide sufficient additional supplies necessary to guarantee that the needs of the local population while protecting the Bururi forest, permit the continuing communal and local reforestation programs to take hold. The project will also produce in four years, sufficient eucalyptus seedlings for 300 hectares, thus supplementing the 50 hectare per year rate of the communal nursery financed under the IBRD forestry project.

Trees planted directly under the project increase total woodland by 1,100 hectares 1/. About 700 hectares will be planted in species suitable for use as construction wood, although dead branches and prunings will be used as firewood along with branches and tops when the trees are cut. The 400 hectares of Callitris planted on the steepest slopes produce 400 cubic meters of firewood a year beginning in year 8. The project's plantings plus wood from existing plantations and private woodlots should meet local requirements for fuel, as well as supplying construction timber needs and the reduced charcoal requirements.

b. Savings on Wood Usage Resulting from the Introduction of Stoves

Introducing 4,000 inexpensive stoves, with a minimum efficiency twice that of open fires, would conservatively result in a 30 percent decrease in fuel usage per household. Consequently, the number of hectares of wood needed to meet rural fuel use would be reduced by about 70 hectares a year, or a total of 280 hectares by 1985. A high estimate for population growth will require an additional 182 hectares of trees for cropping by 1985 in addition to the demand for wood estimated at the equivalent of cropping 1,000 hectares. Therefore introducing stoves will decrease to 900 hectares the net area of forest required to meet the fuel needs of the rural population.

1/ Excludes the 100 hectares of local species within the forest itself.

c. Increased Rural Incomes

Increased rural incomes result from employment in the nurseries and plantations. Up to 400 people will be employed as laborers on the project. The Bururi area produces almost no cash crops, so rural cash incomes are particularly low. About 45 percent of the salary costs of local residents employed in the program represent an increased income flow into the area. Given high marginal propensitie to consume in subsistence agricultural economies, the multiplier effect will be significantly higher.

Cutting the construction wood trees will probably create additional local employment.

Peak labor requirements in agriculture and on forest plantations do not coincide. It is anticipated that the people employed on the project will be predominantly men, while women work on food production.

2. Direct Benefits (non-Quantifiable)

The improvement of the environment arising from stabilization of soils and watertables and the protection of a tropical high altitude rainforest from destruction are major benefits from the Bururi Forest project. The benefits, however, cannot easily be reduced to monetary values, although avoidance of the loss of biomatter contained in the forest is an important benefit. Humid high altitude forests are vanishir rapidly from Eastern and Central Africa. These forests contain several species of birds and particularly of plants which are very rare indeed, and have not been studied adequately yet.

Other benefits include the avoidance of negative effects such as production decreases due to soil loss through flooding and positive effects such as those deriving from the benefits of water regulation. A few thousand people live in the area close enough to the forest to benefit directly from slower rates of soil loss, but it has not been possible to measure these effects or place a value figure on them due to the lack of basic data on soil loss or crop production figures for the area.

Preservation of Bururi forest combined with the new plantings should reduce runoff into the Djiji river, a tributary of the Mirembwe river. This river basin is densely populated and the river goes just south of the sizable market town of Rumonge. It is only about 25 kilometers as the crow flies from the Bururi forest area at an altitude of more than 2,100 meters (6,900 feet) to Lake Tanganyka at 772 meters (2,534 feet). The Zaire/Nile Crest gets heavier rainfalls than the rest of the country and the steep slopes exacerbate the runoff.

Flooding can occur easily and bridge washouts occur. The Mirembwe river cuts across the main lakeside north/south route (National Route 3) just north of the turnoff of Route 6 to Bururi. Severe flooding worsened by the loss of protective cover in the Bururi Forest area, could contribute to washouts along the lake route. This would sever the main transportation arteries to the Southern two thirds of Bururi province, including Bururi town itself and Nyanza-Lac.

The largest proportion direct benefits from the 400 hectares of Callitris plantation on steep slopes stem from their purpose as land cover. There are no direct benefits from the 100 hectares of local species planted inside the forest.

3. Other Benefits

a. Some longer term jobs will be included in plantation maintenance.

b. Seedlings sufficient to cover 300 hectares of private and communal plantations will be produced under this project and the local inhabitants will plant them as a source of firewood and timber.

c. Since more than 20 percent of local usage comes from town dwellers and institutions, plans are being made to encourage town dwellers and institutions to switch from wood/charcoal to peat. Kishubi and Katanga bogs are only 25 kilometers from Bururi. The Army is already using some peat from Kishubi bog. These institutions will be contacted by the extension and marketing program run by the National Peat Office (ONATOUR) and supported by the Peat II project.

d. Costs of overseas training and trials of fast growing species are not included in analyzing the returns from the project, because their benefits will be felt primarily in future projects and programs.

4. Benefits Accruing to Women from the Project

As indicated in the socio-cultural analysis and Annex H, women are traditionally responsible for gathering fuel and producing food. Among other things men prepare charcoal and work on peat bogs, in nurseries and tree planting programs. Women will benefit from using an improved stove and will, because of its increased efficiency, spend less time gathering wood. Carol Dickerman's field interviews indicate that women, as well as men, are interested in planting their own seedlings to produce firewood. (Men are also interested in growing trees for construction wood, particularly poles). The Bururi Forest project will increase fuel availability, particularly after the initial stages of the project. If nothing is done and the forest cannot be

effectively closed off, there will be no forest in ten years time. Although the idea of using locally made banana leaf baskets as containers for seedlings was explored and has attractiveness as an additional source of income for women, its usefulness and effectiveness is definitely questionable.

C. OUTPUTS

1. "Protection of 1,400 hectares of existing natural high altitude Bururi Forest, including wildlife and plants, as a natural asset and for future ecologic and genetic research."

The major assumption behind this is that existing plantations combined with use of crop residues will be sufficient to meet fuel and construction wood needs of the local population within a 10 kilometer radius of Bururi until the plantations established under the project can be harvested.

2. "Watershed protection in the headwater of the Malembwe river."

Both the preserving of Bururi Forest and the planting of 1,200 hectares of trees around the forest will help protect the steep slopes of the upper Malembwe River watershed, and prevent flooding downstream.

3. "Increased availability of fuel and construction wood as a result of tree planting in the Bururi area."

Plantings made under the project include 400 hectares of Callitris on the steepest slopes, 100 hectares of Grevellia, 300 hectares of pines, 200 hectares of Cupressus, 100 hectares of eucalyptus and 100 hectares of local species to fill in gaps in the Bururi Forest itself. Eucalyptus nursery will produce 400,000 plants for distribution of seedlings to farmers for private and communal plantations.

Pine, Cupressus and Grevellia will produce 12 cubic meters of wood per hectare starting in year 12, whereas eucalyptus will produce 13 cubic meters per hectare in year 8. The Callitris, which is slow growing will eventually produce about 1.6 cubic meters of firewood per hectare for cropping.

The wood requirements for the Bururi area during the interim period are approximately 13,500 cubic meters a year. It will be met from 375 hectares of farm woodlots and approximately 1,500 hectares of national and communal plantations, with a mean annual increment of, conservatively 15 cubic meters a hectare of a total of 28,000 cubic meters.

It is also assumed that the combination of new plantings within the forest and private/communal plantings from the nursery will, in time, serve the fuel and construction wood requirements of immediate Bururi area sufficiently to ensure indefinite preservation of the Bururi Forest. It is assumed that farmers will undertake plantings from nurseries on their property as a source of future firewood needs.

The trees that will be planted in the Bururi Forest and its surrounding belt will be grown in a tree nursery. The nursery will be located next to a stream because the seedlings must be hand watered during the dry season, and watering can thus be accomplished more efficiently. Dump trucks and wagons pulled by tractors will transport the seedlings from the nursery to the plantation site.

The 30 kilometers of forest trails that will be built for the project will be constructed with hand labor. These trails will be 3.5 meters wide with turnouts and outslopes, both to preclude the need for drainage ditches on the uphill side of the roads and to prevent washouts. This type of track will be adequate for the life of the project, and for the vehicles used on the project - pickup, trucks, farm tractors and motorcycles.

Twenty five men could construct the trails in 105 workdays at a total labor cost of $2,700. The roads will be used to move people and seedlings from the nursery to the planting areas. Also, they will provide maintenance and patrol routes. This road will short cut the existing road which enters by a roundabout route and requires about 30 minutes to reach the forest. It also crosses a large creek often impassable in the rainy seasons. The roads will be "put to sleep" (ditched and seeded with grass) when the final planting season is over in order to minimize erosion.

Firelanes 3.5 meters wide will be constructed on the downhill sides of the new plantations at the end of the planting season before the vegetation dries out too much. Hoes and rakes will be used to construct the firelines. A search will be made for a low lying ground cover which can be planted on the fireline, but which will remain green and therefore not detract from the firebreaks' effectiveness. This will reduce to a minimum erosion which might possibly be caused by clearing of the vegetation.

Five rows of eucalyptus will be planted on the upslope edge of the fireline and will also act as a firebreak. Eucalyptus of the species used in this project should shade out grass on the ground and help create an effective firebreak when used in conjunction with the bare earth fireline. The eucalyptus will be planted at the same time as the rest of the seedlings in the plantation and is counted as part of the total hectares of forest.

4. "Strengthened institutional capacity of the Department of Water and Forestry for innovative development and management of Burundi's forest and farm woodlot resources".

The Bururi Forest project requires one forester, one assistant forester, three forestry monitors and three monitor/helpers. It will also need an accountant, a mechanic, two drivers and two assistant drivers. It is assumed that the DWF, strengthened by technical assistance from this and other projects, will be able to assume management of Bururi Forest upon the completion of the project.

Technically, the Bururi Forest project is quite straigthforward and does not present any unusual problems. The IBRD project includes financing a program for training 103 foresters, and virtually all of this training will be in conventional forest management. The DWF has had experience with similar tree production and planting programs, but has previously concentrated primarily upon plantations for construction timber and it has only recently begun the private plantings program.

The unusual aspect of the Bururi Forest project lies in its integrated nature, its stress on rural needs and wood production by and for the rural population. Therefore, AID is proposing that the training financed under this project include exposure to successful innovative non-conventional wood producing programs in other developing countries. We suggest that the training take the form of a rather lengthly study-tour of South Asia, particularly India, where there have been innovative programs with appropriate technology that include the participation of the local people in the entire project from initial planning and site selection through planting and harvesting.

5. "Development of a conservationist attitude in the inhabitants of the Bururi area through an extension effort".

Achieving this output objective depends upon the rural population accepting the principle that firewood, posts and poles are no longer free goods, but must be grown or purchased in the same manner as food.

In the process of designing the Bururi Forest and Peat II projects field interviews were undertaken to determine the rural attitude towards fuel as a free good. It is apparent that attitudes are shifting, particularly in the more densely populated provinces, in that people will buy a grown tree to use for fuel, and they are interested in growing their own, even if they have to pay cash for seedlings.

A forestry extension instruction program implemented under the project will include information on how the local people may obtain seedlings through the project, how to plant and care for the seedlings,

and general information on conservation and how it affects the local population. The objective of this program is to convince the local farmers to protect the very valuable resource of the Bururi forest.

6. "Extending the use of fuel efficient wood stoves."

As indicated in the socio-cultural and economic analyses, the local women appear to be interested in a more efficient cooking method than the present use of three rocks. Wood burning and peat burning stoves have similar requirements regarding air flow. A stove would have to be simple and require very little cash, and introducing it would require extension work. To this end the project will include a program to introduce very inexpensive cookstoves which use fuel efficiently into the households near the forest. This will reduce the pressure to cut local stands of timber.

7. "Conducting some applied research to discover fast growing tree species adapted to growing conditions in Burundi."

During the last ten years, many new tropical tree species have been discovered which grow two to five times as fast as species currently being planted in Burundi for fuelwood. Most of these have been discovered so recently that no information is known about growth requirements outside the area in which they were discovered. The participants on the study tour will bring back seeds and technology which will then be integrated into growth trials underway at the Burundi Agriculture Research Institute forestry station at Kisozi. Results from these trials, if any of the species are found well adapted to the area, could well be the major factor contributing to the solution of the fuelwood crises already felt in Burundi as elsewhere in Africa.

The project will also make use of the resources of the International Council for Research in Agroforestry (ICRAF), headquartered in Nairobi.

D. PROJECT INPUTS

1. AID

a. Technicians ($161,080)

As explained in the Administrative Analysis section, AID/Burundi thinks there is sufficient technical personnel, both expatriate experts and local, so that the project does not need a full time U.S. project manager/forestry advisor to implement the project. The GRB will need some short term consulting services,

including a forestry advisor, stove consultant, a local stove engineer, a short term forestry research consultant on quick growing species, evaluation and income earning opportunities. The forestry advisor will spend eight workmonths in Burundi over the life of the project. He will get the program started, monitor the planting of seedlings in the nursery and transplanting seedlings at the plantation site. About 14 work months will be needed for the other consulting services.

b. Participant Training ($45,000)

This project will include only a small training component aimed specifically at a rural fuel/construction wood production. It is felt that the most useful type of training would be exposure to successful innovative wood producing programs in the third world. In this light a staff member of the DWF and one from ISABU should be sent to developing countries such as India, the Philippines, and Indonesia for perhaps six months to observe and study projects focusing on wood production for and by rural people.

c. Construction and Commodities

(1) Construction ($73,000)

Altogether five buildings will be constructed under the project. AID will finance the project office and garage/warehouse which will be located close to the nursery. The GRB will finance construction of three houses as residences for the Burundi project manager, his assistant and the accountant.

The AID-funded office will accommodate these same three GRB project offices, plus a small conference room/library and storerooms. The garage/warehouse will house a small repair shop, vehicle maintenance tools, supplies and a small storage room for tools/equipment, seed, fertilizer, etc. All structures are expected to be constructed to local standards and they may be built "en régie" 1/ by the GRB itself.

(2) Commodities ($197,000)

Project equipment will include one tractor and four trailers, one dump truck and one trailbike, six bicycles, one pickup, one disk plow, miscellaneous office equipment supplies and tools for the nursery and transplanting. All the above mentioned equipment, except the tractor and plow, will be purchased locally and waivers will be needed for vehicle purchases.

1/ Work executed and supervised by employees of Public Works.

d. Other Costs

(1) Nursery and Plantation Establishment ($197,320)

This input includes all the costs of establishing a nursery and the plantations, except for the commodities mentioned above, and POL. The largest cost item is labor. The inputs are sufficient to establish the nursery, the 1,200 hectares of new plantations around the forest, seedlings for 300 hectares of additional private planting, and 100 hectares of local species within the natural forest.

(2) Plantation Maintenance

About $32,700 will be needed for maintaining the plantations.

(3) Vehicle operations and maintenance will require $

(4) Training materials and research will require $13,000.

e. Inflation ($277,300)

f. Contingency ($113,300)

2. Government of the Republic of Burundi's Inputs

The GRB inputs total $219,046, or 16 percent of total project costs.

a. Personnel ($68,489)

GRB personnel assigned to the project include a forester, an assistant forester, three forestry "moniteurs" and three "moniteurs'" helpers. The project has also a mechanic, two drivers and an assistant driver.

b. Capital Investment/Construction ($71,136)

The GRB will finance and build the three houses for GRB staff on the project, as well as construct the trails and firelanes. Most of the expense in making trails and firelanes can be attributed to hiring laborers.

c. Other Costs - Maintenance ($7,887

This line item includes maintenance on project buildings, trails and firelanes.

d. Inflation ($50,575)

e. Contingency ($22,128

Table I

Bururi Forest Project Expenditures

(U.S. $)

	Year 1	Year 2	Year 3	Year 4	Total
U.S. Government					
Personnel	54,580	54,520	26,040	26,040	161,080
Participant Training	45,000	-	-	-	45,000
Capital Investment	214,000	3,000	3,000	3,000	223,000
Other Costs	5,420	88,780	118,160	111,960	324,320
Subtotal	319,000	146,200	147,200	141,000	753,400
Inflation	47,850	47,150	76,700	105,600	277,300
Contingency	47,850	21,950	22,100	21,400	113,300
Total	414,700	215,300	246,000	268,000	1,140,000
GRB					
Personnel	4,366	21,374	21,374	21,374	68,487
Capital Investment-Construction	68,353	1,376	970	436	71,134
Other Costs/ Maintenance	-	2,347	2,664	2,870	7,882
Subtotal	2,719	25,096	25,008	24,679	147,503
Inflation	1,091	8,094	13,026	18,485	50,515
Contingency	1,091	3,764	3,752	3,702	22,128
Grand Total	4,539	36,955	41,787	46,865	220,146

III. PROJECT FEASIBILITY ANALYSES

A. TECHNICAL FEASIBILITY

1. Ecological Conditions:

The Bururi Forest caps the 2,100 meter high ridge of the Nile Crest immediately behind the village of Bururi. The ridge is rocky, the soil thin with many rocky outcrops, and slopes mostly over 60 percent the combination comprising a poor site. Rainfall is 1,300 - 1,600 mm (52-63 inches), the average daytime temperature is 17 - 19 degree C with nightime temperatures sometimes approaching 0 degrees C.

The forest is comprised of several varieties of trees species with a dense understory of vines and brush. It is difficult to move through the forest because of this dense underbrush and steep slopes. Local people call it a rain forest, and the orchids, moss, vines and ferns indicate seasons of high humidity. There are also long dry seasons June-September and November/February when little moisture is present except for dew. The forest is very dry then and extremely susceptible to the fires set by local pastoralists in adjacent fields to control ticks and encourage grass sprouts. These fires occasionally kill trees on the forest perimeter which are then cut for local use. The forest thus loses several hectares annually and the environment another battle.

Many species of birds and a number of small animals still inhabit the Bururi Forest. Most of the animals, however, have moved into several thousand hectares of scrub forest nearby which covers steep slopes down to Lake Tanganyka about 25 kilometers distant and 1,300 meters lower.

The village of Bururi has about 100 households although it is the provincial administrative center. There are few private residences. Pressure on the woodlands is great, however, because of the public institutions in Bururi: an army camp with a large garrison of perhaps 800-1,000 men, a hospital, two church missions, three boarding schools and a bakery. The countryside is thinly populated (98.6 people per square kilometer) compared with the north of the country where population densities reach and exceed 300 people per square kilometer. The PP team has estimated the wood use for Bururi at 22,000 steres of wood per year. The local "agronome" who is the officer-in-charge for the forestry program, reports a substantial tree planting program of 350 hectares in 1979. During the PP study, virtually everyone asked about firewood acknowledged it was a growing problem, and said that they were all planting trees at home or were sure they would have to do so soon.

ven with the large area of scrub forest fairly close to Bururi, the town of Rumonge, on the lake, (population circa 5,000) uses large quantities of charcoal and firewood, making wood expensive all over the area. Rumonge is also a major market center for supplying Bujumbura.

The Bururi forest itself is not officially a source of the local wood supply and has not been for several years. However, the official line is hard to accept completely, considering the high value of wood and the proximity of numerous rugos (homesteads), several of which are inside the forest on the side of the ridge opposite Bururi village. From several short forays into the forest it appears no live wood is being removed. Evidence of at least one dead tree was seen to have been cut and removed, and this indicates others are being taken. The removal of dead wood does not endanger the forest, and if that is all that is being removed, this project will have no negative impact on the availbility of wood around Bururi. In fact, the long term Project impact will be positive, because of the contribution to the local wood supply.

The establishment of nurseries and plantations in the Bururi area will not be an ecological problem. Although the slopes to be planted are steep and rocky, many slopes of equal steepness, etc., have successfully been planted nearby, without adversely affecting the terrain.

2. Species Selection and Wood Yield

Based on joint GRB/AID discussion the following species have been chosen for planting around the Forest: Pinus patula, Cupressus lusitanica, Grevillea, Callitris and Eucalyptus grandis, microcorys and camaldulensis. This mix is somewhat different from that proposed in the PID. The mix was changed to avoid possible insect and disease problems in the plantation, and because Callitris, the predominant species in the PID mix, was considered both too slow-going and a poor producer of fuel/construction wood. The mixture now proposed will provide much more fuel wood for local use and serve more effectively as a buffer between wood-gatherers and the natural forest. These species have been found to grow on the generally poor, rocky soil which is the project site, and were selected in discussion with the Director of DWF and Mr. J. Bielen, a Belgian Forester with 21 years of experience in Burundi. Callitris will be planted on the sites where there is almost no soil, but mainly piles of rock and rock outcrops. Callitris can survive on such sites where no other tree species will, and the tree cover will improve the site so that eventually other species can become established. Although not a commercially useful tree on these sites, firewood can be gleaned from dead Callitris branches. This species requires no maintenance and seed is readily available in Burundi and Rwanda.

The other species will be planted on the slopes which are not yet eroded to rock surfaces. They will produce saw timber and small wood at rates shown in the following tables (see note below);

Wood Production

Eucalyptus:

year	Yield (m^3/ha)	Mean Annual Increment (MAI) (m^3/ha)
8-Seeding cut	120	15
16-coppice cut	120	15
24-coppice cut	96	12
32-coppice cut	80	10

All Others:

year	Yield (m^3/ha)		
	sawlogs	smallwood	Total
12 thinning cut	20	15	35
15 thinning cut	35	20	55
18 thinning cut	40	20	60
25 final/harvest cut	120	30	150
Total volune	215	85	300
MAI			123 m^3/ha

Note: These Volume tables were taken from the 11,000 hectare World Bank Forest Project for the Bururi area. The "all other" volumes are those for Pinus patula, the species used in their project. These World Bank figures are used as best estimates, since no other volume tables in Bujumbura are at the disposal of the PP team at the time of writing.

Inside the natural forest, only indigenous species will be planted. They will be:

Scientific Name	Local Name
Flagenia abyssinica	Umuzuzu
Macavianga neomildbraediana	Umutwenzi
Trema orientalis	Umhefu
Flarungana madagasceariensis	Umushayishayi
Entandrophragma excelsium	Umuyove
Lymphnia globulifera	Umushishi
Albizia adianthifolia	Umusebeyi
Newtonia buchananii	Umukerekwa
Podocarpus milanjanus	Umufu
Strombosia schefflori	Umushiga

The first four are pioneer species, the last six are climax species in the forest. The proportion of the above mix will be determined by the quantities of seed which can be collected during the year.

3. Nursery Production of Trees

Seed production varies among the species from April to December and, of course, the size of the seed crop depends on the weather, etc. Seed of natural species must be collected and planted in the nursery quickly to avoid reduced germination. This seed will be purchased from local people contracted to collect it. The planting schedule is:

AREA PLANTED (Ha)

Year	Species							Total Plants Required
	Callitris	Cupressus	Grevillea	Eucalyptus	Pine	Local SPP	Total	
1	-	-	-	-	-	-	0	
2	200	-	-	150	100	30	480	725,000
3	100	100	100	100	100	35	535	795,000
4	100	100	-	150	100	35	485	730,000
	400	200	100	400	300	100	1,500	2,250,000 plants

The nursery will be approximately one hectare in size and situated close to Bururi town and the forest, on the banks of a permanent stream. (The seedlings will be watered by hand-watering cans). The nursery will be laid out and prepared for planting during the first year of the project. The first seed will be planted in February 1982 (except for some local species if collected earlier). All nursery preparation work will be done by hand tools such as hoes, rakes, wheelbarrows, shovels, tractor and plow, provided under the project.

Seeds will be germinated in small earth-filled wood frames about 30 cm square and 3-5 cm deep, then transplanted at about two months to individual plastic bags filled with dirt mixed with 5 grams of 15-15-15 fertilizer to produce vigorous seedlings. The bags will be placed in seed beds 10 by 1 meters with 1 meter walk space between beds. Each seed bed should hold about 28,000 seedlings. They will be moved to the planting site in trailers pulled by the tractor and truck provided under the project

4. Plantation

Approximately ten years ago the GRB initiated measures to protect the Bururi forest from extinction. Laws were enacted designating the forest as a protected resource, and prohibiting cutting and removal of vegetation, firewood, animals, and birds. A belt of black wattle trees was planted above Bururi town at the foot of the mountain to demarcate the protected area. (See maps). Grazing is the only activity allowed in the area between the belt and the forest. The plantation will be established in this area, creating a buffer of exotic species from which local people can glean firewood rather than entering the natural forest.

This protected area, being on the flanks of a 1,000 foot high ridge between the forest and black wattle belt, is steep and rocky. The soil is thin, only a few inches deep in most places, with rock frequently at or near the surface. Most of the site has a southern exposure making it very dry. This combination of factors makes for a poor site for trees and will cause tree growth to be slow.

Site preparation will be by short-term hire manual labor, supervised by regular DWF personnel. The DWF has several years experience in nursery and plantation establishment and should be well technically qualified to implement this project. Their standard tree planting practice in Burundi, as elsewhere in the tropics, is to layout the area clear of about one square meter, and dig a hole for each tree well in advance of planting. This is done for several reasons, among them to even out the annual labor requirement, and to aerate the soil at each hole. The hole digging process is laborious because the planting sites are usually in steeper rocky areas where often several starts must be made to get one hole dug.

At transplanting time, the seedlings are transported from the nursery by tractor and trailer or trucks to the planting site. They are unloaded into baskets and hand carried to the holes. A small handfull of fertilizer is placed in the hole and dirt is sprinkled over it. The plastic bag is removed and the dirt from the hole replaced around the roots and tamped in place. Because each seddling will have a ball of earth around the roots (especially necessary in the tropics due to the lack of a dormant season and the necessity of keeping the roots moist) ground preparation is slow and planting time is estimated at 200-250 trees per day. The transplanting season is November/December during the rainy season so the seedlings will not have to be watered. Maintenance will consist of cutting the grass and weeds around the plants when necessary (2-3 times/year) and fire protection. There is adequate labor available at the planting seasons, and much land in the area is government controlled.

5. Intercropping and Grazing

Intercropping is considered unfeasible because of the combination of steep slopes, thin soil and elevation of the site. There are few if any fields in the Bururi area located on such sites, and these are used chiefly for grazing. Grazing by animals in the proximity of the forest is not considered to be a threat to the woodlands.

There are always several children or other herders with the typically small (5-6) herds of cattle. Also, the tree species to be planted are usually not eaten by cattle as they find the leaves unpalatable. The site is currently utilized by local herds and continuation of this use is deemed acceptable until the crown canopy closes and shades out the grass - probably in three to five years. If the grazing is later observed to be a threat to the seedlings the herders can be instructed to take the cattle elsewhere.

6. Poaching and Interim Wood Supply

As is mentioned in the sociological analysis, it is hoped that this project will not impose hardships on the local populace greater than that which already exists, due to its exclusion from the Bururi forest. A law to exclude the forest from local use has already been in effect for approximately five years. Everyone interviewed -- government employees and private individuals -- agreed that no wood was being taken from the forest because of this law. Whether or not this is true, and it is assumed it is not completely true, a more vigorous enforcement is expected after this project starts. As the supplies of wood outside the forest increase, due to this and other projects, it is expected that any wood removal (poaching) now taking place in the Bururi forest will be reduced or eliminated.

The increased wood supply in the area will come from the 1,500 hectares of plantations to be provided by this project, the 50 hectares per year of seedlings to be supplied by a World Bank project nursery in the area, and the growing GRB reforestation project which distributes seedlings for individual planting now for perhaps 100 hectares annually.

7. Extension

Enough eucalyptus seedlings to plant about 300 hectares will be grown at the nursery and distributed to the residents of the Bururi area for planting around their homes and in communal woodlots. The wood produced from these trees will increase area wood supplies, thus further reducing any necessity to enter the natural forest for fuelwood.

The DWF is already implementing a private tree planting program in Bururi Province. Official records show distribution of enough seedlings to replant 375 hectares in Bururi Province as of 31 December 1979. This ongoing program is supplemented in 1980 by a World Bank financed nursery near Bururi which will eventually produce approximately 100,000 tree seedlings per year for about 50 hectares of private and communal planting. Seedlings will be sold by the nursery for 4 FBu each.

The GRB has agricultural moniteurs (workers) in place at each colline. Many of these moniteurs already have experience in distributing tree seedlings, giving instructions in their planting and maintenance, and checking on survival at later dates. By the time seedlings are to be distributed from the project, November 1982, most moniteurs in the area will have several years experience. A refresher course given periodically by the Department of Agronomy is considered sufficient to bring the moniteurs to an acceptable level of competence at that time.

The extension program under this project is simple and straightforward. People who want seedlings will come to the nursery and apply for them. (The present GRB program allows up to twenty per family). When the seedlings are ready for distribution, the applicants are informed and they come and pick up their plants at the nursery. At the nursery they are instructed how to plant and care for the seedlings. The local moniteur visits the rugos of those with seedlings and checks to see that they have been planted correctly. The moniteur will also check once again at a later date to check survival and give any needed information or help.

With respect to the question of acceptance, the sociological study done in conjunction with the PP indicated that the local populace is already well aware of both economic and convenience benefits of tree planting around their homes and on communal lands. DWF believes that the response to the private and communal tree planting program will continue to be good. No special incentives are deemed to be necessary, other than normal extension efforts by the moniteurs to inform the population. Inquiries made by the team sociologist in Bururi indicate that the Bururi people would pay up to 5 FBu for them. If sales prove to be slow at that price, consideration should be given to lowering the price to 2-3 FBu each. The seedlings should not be given away, as it is important for farmers to have a financial stake in the growth of the trees planted under this program.

Fundamentally, the extension effort will stress adoption of good tree management practices and avoidance of common but inefficient procedures. For example, participating farmers will be encouraged not to cut down their trees when they are only three years old as their trunks happen to be a convenient size for building poles, thereby interrupting growth just at its period of most rapid volume growth begins.

8. Private Voluntary Organizations (PVO's)

The use of PVO's suggested in the Washington PID review cable (attached as Annex A) is not considered necessary for the satisfactory execution of this project. Sufficient expertise exists in the GRB Forestry Department to carry out the project, assisted as needed by the AAO Agriculture/Forestry advisor and the U.S. short-term consultants.

Food for Work also is not being considered because of the time consuming problems that the AAO is presently encountering in projects in which it is a component. AAO has decided against Food for Work because of inadequate storage facilities, excessive losses due to pests, spoilage, and improper handling, difficult in-country distribution and administrative difficulties.

B. ECONOMIC FEASIBILITY

1. Economic Overview

Burundi is a predominantly rural country. Only five percent of the population lives in urban areas and the rural-based primary sector is responsible for 75 percent of the GDP and more than 90 percent of foreign exchange earnings. However, production in the primary sector has grown an average of only 1.6 percent per annum since 1970, which is less than the population growth rate estimated at 2.2 percent per annum. The difficulties of overcoming the attendant decline in living standards are compounded by the existing high population density, an average of around 160 persons per square kilometer, which is putting increasing pressure on the traditional agricultural production system.

During the middle 1970's high world prices for coffee dramatically increased Burundi's foreign exchange reserves and Government revenues from export taxes on coffee. Budgetary expenditures increased 36 percent in 1976 and a further 25 percent in 1977. The optimism engendered by these changed circumstances is reflected in the third Five Year Development Plan for 1978-1982 which planned investments of $751 million (1976 prices), 20 percent of which was intended for the rural sector. The planned level of investment was expected to result in a rate of growth in the agriculture sector of 3.4 percent per annum over the Plan period and an overall average annual growth rate of 5.6 percent in GDP. Several circumstances, primarily external to Burundi, have worked against this hopeful program: falling coffee prices, raising petroleum prices and the war in Uganda, which disrupted Burundi's supply lines and restricted the amount of cement and petroleum available in the country during several months in 1979. As a result, the Government was forced to revise its planned investment program under the Five Year Plan downward to approximately $550 million (1977 prices - this represents a reduction of 31.6 percent in real terms). During 1979, the growth of production in the primary sector remained at 1.6 percent, the secondary sector (manufacturing) registered a drop in production of 5.9 percent (due to shortages of cement and fuel), while the tertiary sector (services) increased by 5.3 percent for an overall growth in GDP of 1.4 percent.

To surmount the barriers to development - a lagging agricultural sector and dependence on external supplies of basic materials, among others - Burundi must attempt to maximize the return from its own resources. Reforestation in the Bururi area will make a contribution to this process by helping to meet local needs for wood resources and thus protecting agricultural production in the heavily populated Rumonge Valley from the consequences of watershed destruction. However, local demands for wood products in the Bururi area derive not only from the indigenous population but also from large institutions located in the area, among them two secondary schools with a student population of 1,000 and a detachment of the Burundian army. In addition, substantial charcoal

production in the area is destined primarily for the urban centers of Rumonge and Bujumbura. As a result, protection of the environment in Bururi, which is essential to maintaining and increasing agricultural production, assuring local supplies of wood products, and preserving the remnants of the tropical rain forest will depend upon a reforestation program which balances external and internal demands on local resources.

2. Assessment of the Demand for Wood Products in the Project Area

The project area is approximately 314 square kilometers based on a radius of ten kilometers from the center of the Bururi forest. Analysis of the demand for forest products by various types of users is essential for planning an adequate reforestation program. Furthermore, it is necessary to assure that sufficient supplies of fuel and construction wood are available, thereby relieving the pressure to cut down the forest and the new tree cover which is planted. The project area includes three different types of wood users: the rural population, town dwellers and institutions.

a. Wood Used by the Rural Population

Given the relatively low population densities (98.6 persons per square kilometer) in the Bururi province, the rural population in the Bururi forest area is approximately 26,000 persons. This figure has been reduced somewhat from average density figures due to the population void in the heavily wooded areas. The rural residents require two types of wood products, firewood and construction wood.

Estimates vary as to the amounts of wood used for firewood in Burundi, a high of two steres per capita to a low of 0.5 stere per capita. Recently, knowledgeable observers of the energy situation in Burundi have tended to agree that the lower figure is more likely to be correct given both the requirements of Burundian cooking (which account for most fuel use) and the availability of wood. Given the size of the rural population and the annual growth rates of trees in the area, the usage figure of 0.5 stere per capita for firewood indicates a total requirement for approximately 1,000 hectares of trees if this demand is to be met from cropping the wooded areas.

Construction wood, primarily in the form of poles, is needed to build new residences and carry out repairs on existing dwellings. Demand for these products varies from year to year within each household and is especially high when sons reach marriageable age, as a separate house must be built for each son and his wife. Overall, demand for construction wood is considerably lower than that for firewood, and has been estimated nationwide at 0.2 stere per capita. This figure indicates approximately 400 hectares of trees are needed to meet the needs of the rural population on a cropping basis.

• Usage Estimates for Town Dwellers

The number of town dwellers is limited, and consists primarily of government officials and teachers at the various educational institutic as well as a few additional persons involved in business or services, approximately 100 households in all. Wood usage of these persons is out of proportion to their numbers as they use most of their wood for cooking in the form of charcoal. This represents a much higher rate of wood usage due to the inefficiency of converting wood to charcoal.

The bakery in the town also uses approximately 240 steres of wood per annum. Total wood usage is estimated at 500 metric tons per annum on the basis of a charcoal usage of 1-1.5 35 kilo bags per household per month, some additional wood usage for heating purposes and the requirements of the bakery. Accordingly, the production of approximately 100 hectares of trees is needed to meet the requirements of the town.

c. Institutional Requirements

An inquiry into the wood usage of various institutions in the area was included in the social analysis. This indicated that the two boarding schools in the area use a total of 656 steres of wood per annum, and the hospital 480 steres. The army camp, which consists of a detachment of perhaps a thousand men, most likely uses in excess of 1,000 steres of wood per annum. Accordingly, the institutional users represent a requirement for the production of 200 hectares of trees.

3. The Contribution of Project and Related Activities to Relieving Pressure on the Bururi Forest and Reforested Areas

The discussion in section 2 above indicated a requirement for 1,700 hectares of trees to permit the requirements of the various types of users to be met by cropping wooded areas rather than destroying them. Communal plantations in the area amount to 300 hectares of trees and state plantations somewhat more than 1,000 hectares. There is an unknown additional area of private woodlots. DWF has given away sufficient seedlings in the area through 1979 (their program started in 1975) to establish 375 hectares of private woodlots. Private individuals also dig up seedlings in the woods and replant them around their homes. A certain portion of local requirements are also met from outside the project area as institutional users buy from private suppliers located up to ten kilometers away.

These figures indicate that the Bururi forest area of approximately 1,400 hectares is probably used for a small portion of wood requirements in the area although it is officially closed and the local population is well aware that it is. Despite this fact, the forest is not currently under heavy pressure, but it is likely to come under greater pressure

due to population growth and a reduction in its area (and that of the state plantations for charcoal production) in the absence of efforts to reverse the process. Analysis of project and related activities which will both work to decrease demand for and increase the supply of wood products (discussed below) indicates that they should be sufficient to stop the destruction of forest, and permit the reforested areas to survive.

a. Activities Designed to Reduce Demand

(1) Town Dwellers and Institutions

Plans to encourage town dwellers and institutions to transfer fuel use from wood to peat (increased supplies of which will be assured by the Alternative Energy Peat II Project No. 695-0103) will have a significant impact on demand as they account for more than 20 percent of local usage. The army detachment in Bururi is already collecting peat from the Kishubi bog. ONATOUR (the Government office responsible for producing and marketing peat) will be contacting other users in the area in the near future as part of its marketing program.

Production from the Kishubi bog and Katanga (a) and (b) bogs (which are only 25 kilometers from Bururi) will be increasing over the project period and will amount to approximately 23,000 metric tons by 1984. Those currently using charcoal in Bururi will have a substantial cost incentive to convert to peat as the delivered cost of the equivalent kilocalories of peat will be approximately half the price of charcoal. With respect to wood users, although the price of peat is considerably higher than the current price of wood in terms of kilocalorie equivalents (its delivered cost in Bururi would be in the order of $3 for the kilocalorie equivalent of $1 of wood) such an analysis does not take account of either the burning properties of peat versus wood or the convenience factors for institutional users associated with peat usage.

Preliminary tests indicate that peat burns both hotter and longer than equivalent amounts of wood. This is important in Burundi where beans which require many hours of cooking, are a staple in the diet. In addition, peat can be used without any further effort by the institution, while considerable labor time is required to prepare wood for usage. Given the small proportion which fuel represents in the overall budget of these institutions, it is likely that they will prefer to use peat despite its additional cost. Woodburning stoves can be readily adapted to peat usage as they have the same requirements for primary and secondary air. Several missions close to the bogs have been using peat in their woodburning stoves for a year or more and are highly satisfied with the results.

(2) The Stoves Program

It is well known that the introduction of stoves to replace the typical rural African method of cooking on three rocks over an open fire would have a profound effect on fuel requirements. Cooking

on three rocks has an efficiency of fuel use of only seven to eight percent, while already existing designs for simple stoves made with locally available materials increase the efficiency of use to between 15 and 30 percent. Even the least efficient of these stoves (15 percent efficiency) represents a 50 percent improvement on the open fire and a requirement for 50 percent less fuel1/ .

The project plans to introduce 4,000 stoves into households in the area (1,000 per year over the four years of the project which would represent a coverage of 75-80 percent of the households). Conseryatively, it has been estimated that these stoves will result in a 30 percent decrease in fuel usage per household (as fuel savings per stove are likely to be higher, this low estimate also allows for a lower than planned rate of acceptance). It has been assumed that the reduction in fuel use will be apparent in the year after the stoves are introduced. Accordingly, the number of hectares required to meet rural fuel use will be reduced by 70 hectares per year from 1982-1985 or a total reduction on the order of 280 hectares by 1985.

Population growth in the area, estimated at 2.7 percent per annum, will result in a requirement for the production of an additional 182 hectares of trees over and above the 1980 level by 1985. Accordingly, the net savings from the introduction of stoves will be a reduction in requirements by 100 hectares of trees suggesting a total requirement for 900 hectares of trees to meet the fuel needs of the rural population by 1985. Hopefully the increase useage of stoves will make it possible to maintain that level of requirements into the future.

b. Increases in Supply

Trees to be planted under the project will augment the wooded area which can be used for firewood requirements by 400 hectares. In addition, 700 more hectares will be available for construction wood but will also provide a source of firewood in the form of dead branches and prunings during the growing period plus branches and tops at the time trees are harvested. The 400 hectares of Callitris will provide an estimated one cubic meter of firewood per hectare from year 8 after planting, and accordingly, will provide firewood equivalent to the production of 50 hectares of eucalyptus. When these new plantings are added to existing supplies from communal/state plantations and private woodlots, these should be adequate to meet local requirements plus provide a source of supply for construction timber and charcoal requirements. The latter need will be declining in any case due to the introduction of peat in the urban areas.

1/ Keith Openshaw, "Wood fuel consumption for cooking could be cut in half", VITA News Special Energy Issue, July 1980, pp. 12-13.

The project will provide the boost to supplies necessary to guarantee that needs can be met while protecting the forest. It will also make it possible for continuing reforestation programs (a communal tree nursery will be established in Bururi under the World Bank Forestry Project which is designed to distribute sufficient eucalyptus seedlings to the rural population to establish 50 hectares of trees a year) to keep up with future demand arising from population growth.

4. Project Costs

The project costs include contributions by AID plus the costs to be covered by the GRB budget. These costs were developed by the project economist in consultation with the forestry advisor. Extensive use was also made of the budget developed by the World Bank for their Forestry Project in Burundi (See World Bank, op. cit.) as cost figures were available from the first year of implementation of the project. As such the budgeted amounts represent the minimum required to achieve project outputs.

The GRB will have an annual recurrent budget requirement following project completion varying between $19,000 and $27,000 (1980 prices) until the construction timber is cut in the 27th year and a sharply reduced amount thereafter ($8,000 in year 28 and $1,000-$2,000 until year 36). These costs are required to maintain the firelines, prune the construction timber, mark trees to be cut, etc. No budgetary expenditures are required to cut construction timber or eucalyptus for charcoal production as private contractors pay the stumpage rate and employ their own labor to cut down, transport and process the timber.

The internal rate of return analysis also includes a cost figure for the contribution made by the rural population to project outputs. These include transporting and planting seedlings, cutting and chopping timber, plus providing materials and labor for stove production.

5. Project Benefits

Four different types of benefits have been identified as resulting from project activities: (1) environmental improvement arising from the stabilization of soils and watertables and the protection of the tropical rainforest from destruction; (2) savings on wood usage resulting from the introduction of stoves; (3) increased rural incomes resulting from employment in the nurseries and plantations; and (4) the value of the wood produced as a result of the project. The first benefit was not reducible to a dollar figure (see discussion below) while the last three benefits were quantifiable as they resulted from the directly productive portions of the project. The methods used to calculate these benefits for the internal rate of return analysis is contained in Annex E.

6. Economic Analysis of Project Benefits

a. Directly Productive Benefits

The internal rate of return for the directly productive portions of the project is 10.26 percent when project outputs are valued in terms of domestic market prices. See Table 1 for a more detailed presentation of the analysis. The method of analysis has been highly conservative throughout and an economic argument could be made for much higher values to be placed on most project outputs. For example, a case could be made that the price of wood would increase faster than the general rate of inflation due to the increasing scarcity of the wood and the price adjusted upward. As a result, the i.r.r. of 10.26 percent represents the minimum return to be expected from the project.

Despite this fact, the 10.26 percent compares favorably with the rates of return estimated by the World Bank for their pine and eucalyptus plantations in Burundi, which were 10.9 percent and 12 percent respectively in domestic market terms 1/, this particularly in view of the fact that there are limited direct benefits from the 400 hectares of Callitris plantations whose primary purpose is to provide land cover, and no direct benefit from the 100 hectares of local species to be established inside the forest. Costs of overseas training and the trials of fast growing species are not included in the analysis, as benefits from these activities will accrue principally in future projects and programs.

b. Reforestation/Conservation Benefits

Avoidance of the irreversible loss of the biomatter contained in the forest is an important benefit, but one which cannot be easily reduced to dollar figures. Other benefits include the avoidance of negative effects such as production decreases due to soil loss through flooding and positive effects such as those deriving from the benefits of water regulation. It has not been possible to measure these effects or place a value figure on them due to the lack of basic data on soil loss or crop production figures for the area. Other possible effects of the project, such as time savings on such tasks as water and wood collection may have direct productive effects as women will have more time and energy for their other responsibilities.

The project has the anticipated satisfactory rate of return for a forestry project; the additional value of the reforestation/conservation benefits (which are unquantifiable in the absence of extensive sampling at a cost not justified by the size of the project) indicates that it is an attractive development investment. As such, it is considered an economically sound project.

1/ The World Bank. Burundi Forestry Project -- Staff Appraisal Report Report No. 2376-BU, May 8, 1979, Table 5, p. 45.

TABLE II

INTERNAL RATE OF RETURN - TANGIBLE PROJECT OUTPUTS
(In Constant 1980 Prices and $000)

	Benefits				Costs 1/					
	Construction Wood	Eucalyptus 2/	Increased Rural Incomes	Total	AID	GRB Estab.	GRB (Maint.)	Rural Popul (In kind) 3/	Total	Cash Flow
1	-	-	-	-	260	72	-	4	336	-336
2	-	6	15	21	129	25	-	9	163	-142
3	-	12	17	29	147	25	-	11	183	-154
4	-	18	14	32	141	25	-	12	178	-146
5	-	24	-	24	-	-	26	4	30	- 6
6	-	24	-	24	-	-	19	4	23	1
7	-	24	-	24	-	-	19	4	23	1
8	-	24	-	24	-	-	19	4	23	1
9	-	24	-	24	-	-	19	4	23	1
10	-	224	-	224	-	-	20	22	42	182
11-20	953	1137	-	2090	-	-	226	130	356	1734
21-30	2171	705	-	2876	-	-	149	85	234	2642
31-36	-	520	-	520	-	-	6	60	66	454

Internal Rate of Return 10.26

1/ All costs inputs are based on year of disbursement not the year of obligation or commitment. Inflation has not been included as it is assumed that both costs and benefits inflate at the same rate.

2/ The estimated value of eucalyptus produced under the program includes wood produced on project plantations, private woodlots, and wood saved as a result of the introduction of stoves.

3/ Includes labor and material costs involved in stove building and maintenance, plus planting and harvesting costs of eucalyptus trees.

C. SOCIO-CULTURAL FEASIBILITY

1. Social Structure

Burundi is one of few African countries which has a single language and culture. Kirundi is spoken by all Burundians whatever their ethnic origin: Twa, the pigmy forest hunters; Hutu, the Bantu people who came from the Congo to subjugate the Twa; or Tutsi, the warrior-herdsmen who were the last to arrive in Burundi nearly 500 years ago. For many years these three peoples existed in a three tiered social system of mutual dependency. The introduction of cash crops in the Colonial period altered forever the traditional social structure. Cash crops enabled some people to rise above the level of absolute poverty, others lost ground as the population increased reducing the amount of available land. Overgrazing and erosion have also contributed to diminishing the land's productive capacity. In contemporary Burundi, poverty and limited social mobility are shared more or less equally by all people except those in a relatively small modernized elite (See FY 1982 and 1983 CDSS).

Although the desire for development is great, efforts to improve the quality of life in Burundi are seriously hampered by its fragmented population pattern. The typical rural family lives in a single rugo (homestead), surrounded by a fence and containing places for animals and storage. The rugo shares a colline (hill) with roughly a dozen similar units usually occupied by kinsmen. Access to social services is difficult and costly. Education and health facilities can only meet the needs of a fraction of the populace. Only about a quarter of primary school age children attend Government schools.

Although the interior of the country is traversed by a network of roads and trails, many farms are two to five miles from a road. Without village centers access to social services is difficult and costly. Education and health facilities can only meet the needs of a fraction of the populace.

2. Role of Women

Burundian women, traditionally, are subordinate to men. The women are responsible for gathering wood, food production as well as caring for the children. Men care for livestock, clear land, prepare charcoal and more recently, produce cash crops. Men are recruited for agricultural work on Government estates, research stations, mission farms and development projects. Seasonal or part time activities exist in road construction, road maintenance and reforestation programs. Those male heads of families with insufficient land or without cash crops seek outside work more often than those with land and crops.

Women have little political power, few legal rights, and cannot inherit cattle or land outright. A woman has no right to any independent action outside the colline. Although she may marry her equal or inferior, traditionally she may never marry her superior. Women, however, have the major influence on food production and use. Fifty-five percent of the 15 to 59 age group in the high altitude zone along the Zaire-Nile Crest are women, and 58 percent of the 15 to 17 year olds are female. Surveys indicate that one third of the household heads in the High Altitude Food Production project zones are either permanently or temporarily female.

3. Spread Effect

C.W. Dickerman's social analysis of Bururi Forest Project clearly demonstrates that in the Bururi project the participation of the rural poor will be an intrinsic part of its success. First, the poor are currently users of wood and will continue to do so for the foreseeable future. Furthermore they realize that the forest is diminishing and understand that it is to their advantage to do preserve it. Clearly they are aware of its importance in their lives and in that of their children's.

Secondly, the peasants would like to find an alternative to their traditional three-stone fireplace. Burundian women are not particularly fond of this primitive cooking method, but presently have no inexpensive alternative. Our study indicates women would prefer using a stove in lieu of their stones as long as it uses wood. Because of the traditional preference the peasants have for cooking with wood or wood products, until a viable substitute is found, they will continue to use wood.

Without the wood the poor will be unable to prepare food or heat their homes. Should the wood disappear it seems certain the peasants would leave Bururi for Bujumbura or one of the smaller towns, and thereby burden the national economy since the peasants have no marketable skills other than that of common laborers.

The length of time necessary for the effects of the project to spread depends upon the success of the planting and survival of the seedlings and also the length of time required for acceptance of the new stove.

4. Social Consequences

The Bururi Project is designed to save the forest so all of Burundi will be helped by the project success. Certainly those in the area of Bururi benefit to a greater extent because it is they who will have access to an additional source of wood and to utilize, before others, the new more efficient cooking stove.

However, those of Bururi will also be the ones who might suffer adverse effects if they occur. In principal the forest is now closed. If this is true and there is little fire or construction wood being removed from the forest, then the program should not result in a radical drop in wood supplies or rise in price. However, it is possible that both cutting and gathering is still being done - even though everyone is aware the forest is closed and officials monitor the forest to enforce the ban. If indeed gathering and cutting is taking place, then the project could quite likely cause a hardship for the area, because true closure of the forest may cause a change in prices and availability of wood. This adverse effect upon the area is undeniable, but arguably it is best for the future of the local people, of the area and for the country of Burundi to endure a hardship of limited duration rather than have no forest at all within ten years time. Perhaps just as important as the additional source of wood is the opportunity for 400 full time jobs for three consecutive years. This certainly is an important factor when few men earn wages and an even smaller number do so year round.

Although there has been considerable thought given to having the women of the area make banana leaf baskets for the seedlings rather than use plastic bags, it seems probable that this is not feasible. The baskets would be exposed to moisture, heat and termites and it is unlikely that the baskets would last long enough to perform their function. Although it was thought that a project in Bukavu, Zaïre, had used banana leaf baskets with success for a similar forestry project, this information proved to be no more than Central African gossip. Certainly, the income providing asspects of the banana basket project are attractive. Its usefulness, however, is questionable and, therefore, should not be considered as source of additional source of women's income.

D. ADMINISTRATIVE ANALYSIS

1. Capacity of GRB Implementing Agency

This project will be implemented by the Department of Water and Forests (Eaux et Forêts) of the GRB Ministry of Agriculture. Because of a significant increase in attention to forestry activities, this department is expanding and currently has no less than 15 expatriate foresters and forestry advisors working on the various donor projects and on institutional support. Although the Burundi professionals working in DWF have received satisfactory training in agronomy, not one of them is a professional forester. However, the DWF staff with whom the PP team had contact, notably the Director and Deputy Director, exhibited a thorough knowledge and understanding of the forestry situation in Burundi. Furthermore, considerable professional forestry training is planned under the UNDP/FAO project which will train 18 foresters and 85 forestry technicians over the next three years.

This project is not a demanding one technically and is of a type in which the DWF staff already has considerable experience. Therefore it is considered to be easily within the DWF's capabilities and only minimal U.S. advisory assistance is required. Technical consultant time has been limited to eight months total, in four, two-month blocks, at the beginning of each planting season to insure that proper procedures are followed.

With respect to labor availability, the local supply is believed to be adequate. DWF is confident that the timely recruitment of 300 - 400 workers will present no problems. This judgment is borne out by the observations of the PP team's social analyst during her interviews in Bururi. There are few cash income jobs in the area and time that men devote to agriculture is limited.

As regards the question of who should pay labor costs of the nursery - it is felt after thorough consideration, that the United States Government should. Not only is it in the best position to pay, but the GRB's economic resources are already over extended. If those labor costs are left for the Burundian Government to bear, the GRB quite likely will fail to meet those costs and the 300 - 400 envisioned will not materialize. Also, the Burundian Government and the people of Bururi are well aware of the need for the seedlings and the importance of the nursery's success. If the Burundian Government could afford to support these labor costs, quite likely they would have done so on their own. This conclusion is reached by utilizing the evidence that there are other forestry projects in Burundi which the Government supports, except in one instance, with assistance from an outside donor to help with the labor costs. Therefore, it seems reasonable to anticipate the U.S. Government bearing the local labor costs for the project.

2. Role of USAID

Since there will be no long-term U.S. technical advisor or project manager, this function will be performed by the AAO's Agriculture/ Forestry advisor. Since he will be the AAO's project manager for two other projects (Basic Food Crops and Small Farming Systems Research), he will be able to devote only half time or less to the Bururi Forest project. Even so, he will devote special attention to this project since it involves his own professional field (forestry) and since the other projects he will manage will have long-term U.S. project staff to handle day-to-day operations. The AAO project manager will of course be assisted by a U.S. forestry consultant for two to four months each year during the planting season. This, combined with the capabilities of the DWF noted earlier, will provide adequate project management and direction.

3. Administration of Labor

Up to 400 laborers will be employed under the project during each planting season. Recruitment and management of this labor force will be similar to the method employed in the Route 84 Rural Road project wherein a series of mini contracts will be let by the GRB with 20-30 reliable individuals in the Bururi area, who would then recruit their own teams of 10-20 laborers each and would be responsible for instructing and supervising these workmen. A full-time project accountant provided by the GRB (DWF) resident in Bururi will maintain payroll and personnel records on all laborers hired under the project.

4. Arrangements for Construction

The technical analysis contains a description of construction to be undertaken under the project and the methodology to be used. To summarize, AID will finance the construction of a small field office and a garage/warehouse and the GRB will finance the construction of houses for the three DWF project staff in Bururi, as well as 30 kilometers of forest trails to be built by hand labor. All construction will be "en régie" by the GRB using Ministry of Public Works construction facilities.

E. ENVIRONMENTAL CONCERNS

An Initial Environmental Examination was submitted with the PID and approved in AID/Washington (see PID approval cable attached as Annex A).

The project design embodied in this PP involved no changes or additions which would cause the IEE to be modified in any way. The very essence of this project remains the conservation of one of Burundi's natural resources and the preservation of the ecology of the project area.

IV. IMPLEMENTATION PLAN

A. Project Implementation

The GRB will administer the Bururi Forest project with only the part-time presence of a U.S. advisor. The AAO's project officer is a professional forester and will be available for consultation, guidance and monitoring, and to assist in commodity procurement and construction contracting. A short-term contractor will be hired for eight work months which will be divided into four separate visits of two months each. This contractor will ensure that the nursery is properly set up and functioning, the planting site, roads and firelanes are being properly laid out, and that field planting is being carried out properly. He will submit status reports to the AAO prior to departure each trip.

The GRB

The implementing agency will be the Department of Water and Forests (DWF) of the Ministry of Agriculture. The GRB will recruit a project manager and staff for the project, provide land for the plantations, the nursery, and the project buildings, recruit foremen and laborers for the nursery and transplanting work, and furnish office supplies and equipment, and furniture for the three residences.

AID

The AAO Project Officer will monitor project implementation through close contact with the DWF, ensure the contractor and the GRB perform according to the project agreement and the contract, and conduct regular evaluations to ensure project implementation is on schedule and that project outputs and objectives are met.

AAO/Burundi will issue appropriate Project Implementation Letters during the life of the project, describing specific actions to be taken during implementation. They will clarify responsibilities and conditions set forth in the Grant Agreement. It is anticipated that all commodities and services, except the tractor and plow, will be purchased locally with the AAO as authorized agent and will have some 935 source/origin commodities or come within the limitations set for "off the shelf" purchases. All project vehicles, except the tractor, will be from a non-U.S. source as indicated in the waiver requests. The AAO will be the agent for project implementation since this project will be only the second AID project with the Ministry of Agriculture, and the first with the DWF. The situation may be changed to designate the GRB as authorized agent if conditions warrant.

Conditions Precedent

Prior to any disbursement, or the issuance of any commitment documents under the Grant Agreement for the purpose of financing project construction, the Grantee will furnish in form and substance satisfactory to AID (a) final site plans, construction plans and specifications, and (b) an executed contract for construction services. This Condition Precedent

is only for the AID-financed office building and shop/storeroom and not for other technical services incident thereto.

Covenant

The Grantee will covenant, in substance, as follow

a) to provide individuals to receive participant training in a timely manner;

b) to provide the Project Manager and the staff and to hire the necessary labor for the project on a timely basis and in accordance with the Project Agreement's Amplified Project Description;

c) to make available the 1,200 hectares of land for the plantation around the Bururi Forest, one hectare of land for the nursery in an appropriate location, and enough land for the project houses, office and shop/storage building.

B. Implementation Schedule

Section IV B provides a chronological listing of key events in project implementation. We anticipate that the project will be authorized and the Grant Agreement signed in May 1981.

The forestry consultant will make his first visit to the site in January 1982 to ensure the project begins properly. Some seed collection and nursery planting of local tree species will be done during the period June-December 1981 to ensure enough seedlings are on hand for the first planting season in November 1982.

The participants should begin the observation tour to India during the dry season, as soon as possible after October 1, 1981.

Implementation will span four years and the PACD is set for December 31, 1984.

C. Procurement Plan

The project will utilize one contractor. The PIO/T for this contract should be issued at the time of, or shortly after the initial Conditions Precedent are met. The tractor and disk plow will be purchased in the USA and due to the long lead time required, they too should be ordered as near as possible after the initial Conditions Precedent are met. It is anticipated the rest of the vehicles and the hand-tools, etc. will be purchased locally. Due to the large number of items involved and the fact that often it takes six to eight

months for goods to arrive in Bujumbura PIO/C's for them should be prepared at once after the initial Conditions Precedent are met. These should all be funded in the first year of the project, FY 1981.

The DWF's capacity to act as procurement agent is addressed in section IV A of the Implementation Plan.

D. Bururi Forest Implementation Schedule

1981		
February	Final draft of PP to AID/A	AAO
March	PP approval and project authorization	AID/W
10 May	Sign Project Agreement	GRB/AAO
29 May	Issue PIL No. 1	AAO
15 June	Begin locating seed for 1982 planting	GRB
22 June	Initial CP's met	AAO
30 June	Commodities ordered	REDSO/AAO
1 July	PIO/T's and C's issued	REDSO/AAO
31 Aug.	Construction contract let	GRB/AAO
1 Oct.	Advisors contracts signed	AID/W, REDSO/AAO
1 Nov.	GRB and ISABU foresters begin study tour	GRB
10 Nov.	Complete CP's on construction	AAO
15 Nov.	Stove consultant and technician begin work	AAO
10 Dec.	Construction begins	GRB
15 Dec.	Layout and work begin on nursery	GRB
1982		
20 Jan.	Forestry consultant arrives	AAO
15 Feb.	Stove consultant and technician complete work	AAO
February	Plant seeds in nursery	GRB
1 March	Foresters return from study tour	GRB
20 March	Forestry consultant departs	AAO
30 March	Commodities arrive	AAO/GRB
May	Site survey, layout and hole digging for seedlings begin on plantation site	GRB
1 June	Construction completed	GRB
June	Plant Eucalyptus seeds in nursery	GRB
10 Oct.	Forestry consultant arrives	AAO
Nov/Dec/Jan.	Transplant seedlings to plantation	GRB
10 Dec.	Forestry consultant leaves	AAO
1983		
January	First PES	REDSO/AAO
February	Plant seeds in nursery	GRB
May	Plant Eucalyptus seeds in nursery	GRB
May	Dig holes at plantation site - build roads	GRB
20 Oct.	Forestry advisor arrives	AAO
Nov/Dec.	Transplant seedlings	GRB
20 Dec.	Forestry consultant leaves	AAO
31 Dec.	Project evaluation begins	REDSO/AAO

1984		
February	Plant seeds in nursery	GRB
March	Second PES	REDSO/AAO
May	Plant Eucalyptus seeds	GRB
May	Dig holes at plantation site	GRB
15 Oct.	Forestry consultant arrives.,	AAO
Nov/Dec.	Transplant seedlings	GRB
20 Dec.	Forestry consultant departs; submits final report evaluation	AAO
December	Third PES	REDSO/AAO
31 Dec.	Project Termination Date	
1986		
January	Post Project evaluation (sociologist and regional forestry advisor)	REDSO
1988		
January	Ex-post Project evaluation	REDSO

V. EVALUATION PLAN

Since the most important results of this project will not be measurable until after the project ends, the proposed evaluation schedule is somewhat unusual. The Project itself is relatively short (4 years) duration yet the effectiveness of the project's main activities (the planting program) cannot be meaningfully evaluated until several years growth has been achieved to determine the survival rate. Also the success of the project in achieving its main objective, the preservation of the Bururi Forest cannot be judged for decades. However, the rate of encroachment into the forest in the years immediately following the project will provide an indication of the degree of the project's success. Other influencing factors are the success of the stove program, the effectiveness of the private and communal planting program and the conservation extension effects.

Accordingly, the PP team recommends the following evaluation plan:

A. An annual project evaluation summary (PES) to be undertaken by the AAO Agricultural/forestry advisor assisted by a REDSO/EA engineer after the first, second and third operational years. Focus would be on the construction of project facilities, the nursery and annual planting and early extension activities.

B. An outside evaluation after year four (project completion) by the anticipated REDSO Regional Forestry Advisor and sociologist to assess all work done under the project.

C. An ex-post project evaluation at the end of year six of operations (two years after the end of the AID-financed project) to inspect the growth of trees planted, the impact of the stove program and other long term effects. The final evaluation could be funded from the then current PDS budget if outside consultants are involved.

BURUNDI

LOGICAL FRAMEWORK

Annex A

BURURI FOREST
(695-0105)

Narrative Summary	Indicators of Achievement	Verification	Assumptions
Goal: To assist the GRB to improve and increase Burundi's forest resource base	Plant up to 240,000 hectares (in 25 to 30 years) of new plantations in fast growing species. Encourage farmers to plant trees on their homesteads to supply family requirements by distributing seedlings, providing extension services and developing communcal forests. Preserve the remnants of native forest.	GRB records, department of Water and Forests (DWF) Final project evaluation	That the GRB will continue its policy of preserving the country's forests and developing new forest resources. That other donors with forestry programs will continue to support forestry policies and programs.
Project Purpose: 1. To preserve one of the last two remaining natural high altitude forests (Bururi Forest) 2. To develop new sources of fire and construction wood in the Bururi area.	End of Project Status Indicators Conditions have been achieved which favor the preservation of the Bururi Forest: 1. 1,200 hectares of plantations around forest (100 of which are native species inside forest) 2. seedling nursery in full operation 3. Production of 300 hectares of Eucalyptus seedlings for communal plantations.	DWF records, Project statistics evaluations, monitoring reports Aerial photography	That Bururi Province Government Officials will support efforts to preserve the forest and enforce anti-poaching laws. That GRB estimates of wood requiremen and current sources of wood in the Bururi area are essentially accurate. That planting mixed proposed in projec is for maximum wood production in minimum time and acreage.

Narrative Summary	Indicators of Achievement	Verification	Assumptions
Outputs: 1. Protection of 1,400 ha of existing natural high altitude Bururi Forest, including wildlife and plants, as a natural asset for future ecologic and genetic research. 2. Watershed protection in the headwaters of the Malembwe river. 3. Increased availability of fuel and construction wood in the Bururi area. 4. Strengthened institutional capacity of DWF for innovative development and management of Burundi's forest and farm woodlot resources. 5. Development of conservationist attitude in the inhabitants of the Bururi area through an extension effort. 6. Extending the use of fuel efficient stoves. 7. Conducting some applied research to discover fast growing tree species adapted to growing conditions in Burundi.	1. Preservation of 1,400 ha of natural forest. 2. Plantings: 400 ha Callitris 100 ha Grevillia 300 ha pine 200 ha Cupressus 100 ha eucalyptus 100 local species 400,000 eucalyptus plants for communal and private forests. 3. Wood Production: Cupressus, Grevillia: 12 m^3/ha from year 12; Eucalyptus: 13 m^3/ha from year 8; Callitris: eventually 1.6 m^3/ha from year 8 4. Wood Requirements Bururi: 13,500 m^3 annually to be met from 375 ha of woodlot and 1,500 ha of national/communal plantations, Mean annual increment of 15 m^3/ha, totalling 28,000 m^3. 5. Forestry extension program reaches local population. 6. Local women using stoves. 7. New species adapted to growing in Burundi.	Project records, TA advisor reports, Project evaluations, AAO monitoring of DWF, soil and water tests in Bururi area, ISABU forestry research.	That existing plantations combined with use of crop residues will be sufficient to meet fuel and construction wood needs within a 10 km radius of the forest until plantations established under project can be harvested. That farmers will undertake planting from nurseries on their property as a source of future fuelwood. That DWF, strengthened by technical assistance from this and other projects, will be able to assume full management of Bururi forest upon completion of project. That the rural population accepts the principle that firewood, posts, etc. are no longer free goods, but must be grown or purchased. That combination of new plantings around forest and communal/private plantings will serve need for fuel and construction wood in Bururi area sufficiently to ensure indefinite preservation of Bururi forest.

Narrative Description	Indicators of Achievement	Verification	Assumptions
Inputs:			
1. A.I.D.:	1. A.I.D.:		
a. Technicians	a. Technicians ($161,080) Forestry Advisor (8 work months) Stove consultant) Stove engineer) 14 work months Forestry research)	AID records	AID provides its inputs and consultants on a timely basis
b. Participant training	b. Participants ($45,000) Two short term third country	AID and GRB records	
c. Construction	c. Construction ($73,000) Office Garage/warehouse	AID records, engineer visits	
d. Commodities	d. Commodities ($197,000) Tractor, trailers, trucks, motorbike, bicyles, office equipment/supplies, tools	AID records	
e. Other Costs	e. Other costs ($337,020)		
(1) Nursery and Plantation Establishment	(1) Nursery and Plantation Establishment. All costs of establishing plantations except commodities mentioned above and POL.	Commune and pr records	
(2) Plantation Maintenance	(2) Plantation maintenance ($32,700)	Project record	
(3) Vehicle operation and maintenance	(3) Vehicle operation and maintenance ($94,000) includes POL, repairs, spare parts		
(4) Training materials and research	(4) Training materials and research ($13,000)		
f. Inflation	f. Inflation ($277,300)		
g. Contingency	g. Contingency ($113,300)		
2. GRB:	2. GRB:		
a. Personnel	a. Personnel ($68,489) Forester, Assist. Forester, 3 moniteurs, 3 moniteur/helpers, mechanic, 2 drivers, assistant driver	GRB and project records	Inputs attributed to GRB will be provided on a timely basis
b. Capital investment	b. Capital Investment ($71,136) 3 houses, trails, firelanes		
c. Other costs	c. Other costs. Maintenance ($7,887) Project Buildings, trails and firelanes		
d. Inflation	d. Inflation ($50,575)		
e. Contingency	e. Contingency ($22,128)		

Annex B

PID Approval Message

R 061923Z APR 80
To AMEMBASSY BUJUMBURA
INFO AMEMBASSY NAIROBI

UNCLAS STATE 091006

AIDAC

B.O. 12065, N/A

TAGS:

Subject: Burundi Bururi Forest PID review (695-0105)

1. Review committee met on 25 February and recommended approval of PID. Committee also recommended approval of negative determination of IEE.

2. Following suggestions made for consideration during design and PP preparation:

A. Appropriateness of proposed tree species should be considered. Are there faster growing species that might also be employed? Site characteristics and tree growth responses should be documented so project can be evaluated and successful results used in similar sites in future. It appears desirable to design planting schemes that allow use of land by villagers during the long period of tree growth (i.e. through controlled grazing and/or intercropping). The taungya system in Asia and the shamba system in Kenya may provide appropriate models. A PPC review of fuelwood projects entitled quote fuelwood use in small rural communities issues and guidelines for project design end quote will be available shortly. Copies will be pouched to AAO.

B. Is the capability of GOB Eaux et Forêts fully adequate to handle this project together with the numerous other existing forestry activities by other donors without being overextended? Should institutional assistance be included in the project?

C. Similarly, the PP team should examine the question of technical assistance closely to ensure that it meets the needs fully, especially if the capacity of the GOB Eaux et Forêts is found to need reinforcement. Possible use of PVO or PC should be considered. (Should you decide to go PVO route you should advise AID/W before you start discussions with a PVO). In this regard you should note that the review committee felt that the multitude of other tasks assigned to mission's agricultural officer would preclude him from providing the amount of technical assistance required, even if reinforcement of Eaux et Forêts is not required.

D. Controlled grazing and intercropping in plantations should be considered as possible methods of controlling weedy plants.

E. A thorough examination should be made of whether selling seedlings to farmers at full cost is possible, subsidized prices may have to be considered since wood has been free to the populace heretofore.

F. Should USG pay labor costs as proposed? Can the GOB participate? Would food for work be practical?

G. Items E&F above are recurrent costs issues. These should be analyzed in context total recurrent cost requirements of the project. Will the GOB be able to pick up recurrent costs after project is terminated?

H. How can poaching be prevented? While the GOB should be able to close off project area effectively, what will be the social effects? This of course directly related to discussion on PID page 17 of need for an effective interim supply of wood for the populace. PP team should examine not only the possibility of harvesting remains of existing communal and state forest plantations within the Bururi forest as interim source while new plantations mature, but also gradually replanting the old plantations as a part of the project.

I. Considerable additional detail will be required as to how extension work (establishing farmer tree planting) would take place.

J. The methodology and possibility of success in establishing idea of wood as a purchase rather than free item is indeed primordial to the execution of this project, as indicated repeatedly in the PID. The socio-economic study of this aspect proposed in the PID should be carried out as one of the basic requirements for effective design. A survey of the social ecology of the Bururi forest population could utilize standard observation and interviening techniques and aerial reconnaissance if feasible. Survey by questionnaire not ruled out but slow. While desirable involve Burundi nationals in process, U.S. (REDSO) involvement would seem essential to insure optimum accuracy and impartiality. An agro-forester (probably AAO's Fisher) should be included on design tram to make recommendations concerning intercropping, forage, and fruit trees and pasture. Local community must perceive that economic benefits to them will result from supporting this project. Project design should allow priority for multiple use by local population. Project extension and education component should utilize periodic services of social scientist and agro-forester to bring about fit between design and management and socio-ecology of population.

K. Is there adequate availability of local labor for the work to be performed? Are there seasonal unavailabilities of labor that might conflict with project needs?

L. A proposal for waiving the 25 GOB contribution should be included in the PP, as should a vehicle waiver. A procurement plan must be included in the PP. A 611A determination is required. An evaluation plan will also be necessary.

.../3

M. The socio-economic analysis should include a careful review of the roles and attitudes of women in the target community. Moverover, women (the traditional wood gatherers) will need new income producing activities to purchase wood. Other possible activities in addition to the banana leaf container proposal should be examined. What provision is to be made for sensitizing the target community, including women, concerning the advantages of conservation, such as preserving forest springs for local water supply?

3. Since project is over existing delegated level, review and approval of project will be in AID/W.

4. Note that this project now renamed from title appearing in CP. To avoid confusion, request that revised PID facesheet be submitted ASAP showing present title and phrase added quote (formerly called agricultural land protection) unquote and that this also be done on PP face sheet.

5. Also note that CP indicates this project to be funded from agriculture category, while PID shows it as selected development. Please advise which is correct. Slug cable for AFR/DP. Vance
BT
#1006

STATUTORY CHECKLIST

Standard Item Checklist has been reviewed for this project

A. General Criteria for Project

1. FY 79 App. Act Unnumbered; FAA Sec. 653 (b); Sec. 634 A - (a) Described how Committees on Appropriations of Senate and House have been or will be notified concerning the project; (b) Is assistance within (OYB) country or international organization allocation reported to Congress (or not more than $1 million over that figure)

(a) Congressional Presentation and Congressional Notification will be submitted for changes since FY 1980 CP.

(b) Yes

2. FAA Sec. 611 (a) (1) - Prior to obligation in excess of $100,000, will there be (a) engineering, financial and other plans necessary to carry out the assistance and (b) a reasonable firm estimate of the cost to the U.S. of the assistance?

(a) Yes (b) Yes, see technical feasibility

3. FAA Sec. 611 (a) (2) - If further legislative action is required within recipient country.

No additional legislative action required.

4. FAA Sec. 611(b); FY 79 App. Act Sec. 101 - If for water or water related land resource construction.

N/A

5. FAA Sec. 611 (e) - If project is capital assistance (e.g., construction) and all U.S. assistance for it will exceed $1 million.

N/A

6. FAA Sec. 209 - Is project susceptible of execution as part of regional or multilateral project?

This bilateral project stands by itself having been passed over by all other donors in the same field. It concentrates on a small but extremely valuable area - preservation of an endangered, irreplaceable resource. Thru production of fuelwood. The other donors' projects concern large scale sawtimber production.

7. FAA Sec. 601 (a) - Information and conclusions whether project will encourage efforts of the country to: (a) increase the flow of international trade; (b) foster private initiative and competition; (c) encourage development and use of cooperatives, credit unions, and savings and loan associations; (d) discourage monopolistic

practices; (e) improve technical efficiency of industry, agriculture and commerce; and (f) strengthen free labor unions.

(a) The project does not address these issues.

(b) This project will foster private initiative thru planting fuel and construction around local homesites.

(c) The project does not address these issues.

(d) The project does not address these issues.

(e) The project does not address these issues.

(f) The project does not address these issues.

8. FAA Sec. 601 (b) - Information and conclusion on how project will encourage U.S. private trade and investment abroad and encourage U.S. participation in foreign assistance programs (including use of private trade channels and the services of U.S. private enterprise).

This project will neither encourage nor discourage U.S. private trade or investment abroad. If a private firm is awarded the contract for technical assitance, it will, to that extent encourage the services of private enterprise in assistance programs.

9. FAA Sec. 612 (b); Sec. 636(h) - Describe steps taken to assure that, to the maximum extent possible, the country is contributing local currencies to meet the cost of contractual and other services, and foreign currencies owned by the U.S. are utilized to meet the cost of contractual and other services.

See financial analysis and implementation arrangements sections of the project paper.

10. FAA Sec. 612 (d) - Does the U.S. own excess foreign currency of the country and, if so what arrangments have been made for its release?

No.

11. FAA Sec. 601 (e) - Will the project utilize competitive selection procedures for the awarding of contracts, except where applicable procurement rules allow otherwise?

Yes

12. FY 79 App. Act Sec. 608 - If assistance is for the production of any commodity for export.

N/A

B. Funding Criteria for Project

1. FAA Sec. 102 (b); 111; 113; 281 a - Extent to which activity will (a) effectively involve the poor in development, by extending access

to economy at local level, increasing labor-intensive production and the use of appropriate technology spreading investment out from cities to small towns and rural areas, and insuring wide participation of the poor in the benefits of development on a sustained basis, using the appropriate U.S. institutions; (b) help develop cooperatives, especially by technical assistance, to assist rural and urban poor to help themselves toward better life, and otherwise encourage democratic private and local governmental institutions; (c) support the self-help efforts of developing countries; (d) promote the participation of women in the national economies of developing countries and the improvement of women's status; and (e) utilize and encourage regional cooperation by developing countries?

(a) The project is designed to help the rural poor directly by producing seedlings of fast growning tree species, which will produce fuel and construction wood - imporving rural income and reducing time required for wood gathering.

(b) It will not affect cooperatives.

(c) It will support self help efforts in wood production and time saving methodologies.

(d) It will improve women's status and reduce the time needed to do their work. In addition it will introduce a stove into the fuel efficient wood miliean, further reducing wood gathering time - a traditional womens' task.

(e) The project neither encourages or discourages regional cooperation between developing countries.

2. FAA Sec. 103 - Is assistance being made available for agriculture, rural development or nutrition: if so, extent to which activity is specifically designed to increase productivity and income of rural poor?

By provision of tree seedlings to families, the rural poor will establish their own sources of fuel and construction wood - freeing funds they would otherwise use to purchase them, and/or providing cash income from their sale.

3. (107) Is appropriate effort placed on use of appropriate technology?

Yes. The extension program will introduce a fuel efficient wood stove at a cost and level of technology most people in the area will be able to afford or make themselves.

4. FAA Sec. 110 (a) - Will the recipient country provide at least 25% of the costs of the program, project, or activity?

No. The GRB will provide about 16% of the project costs.

5. FAA Sec. 110 (b) - Will grant capital assistance be disbursed for project over more than three years?

No.

6. FAA Sec. 281 (b) - Describe extent to which program recognizes the particular needs, desires, and capacities of the country; utilizes the country's intellectual resources to encourage institutional development; and supports civil education and training in skills required for effective participation in governmental and political processes essential to self-fovernment.

This project recognizes Burundi's need for increased production of fuelwood and its capacity to produce it. The project relies on the realization of the need to make available the means to carry out the program. The project will increase rural people's planning skills thru the extension program. This improvement will support more effective participation governmental and political processes essential to self government.

7. FAA Sec. 122 (b) - Does the activity give reasonable promise of contributing to the development of economic resources, or to the increase of productive capacities and self-sustaining economic growth?

Yes.

Annex D

MINISTRY OF FOREIGN AFFAIRS
AND THE COOPERATION

No. 519.1/634/AE

To Mr. the Representative of U.S. AID

BUJUMBURA

23 June 1980

Mr. the Representative,

Following your letters No. AAO-80-60 of May 26, 1980, and No. AAO-80-101 of June 5, 1980, I have the honor to submit for financing by the Government of the United States of America the request of the Government of Burundi concerning the project "Bururi Forest".

The aim of this project is to protect the enormous Bururi Forest which presents various interests in its quality of remnant of natural (primary) forest, the remnants necessary to protect for its sake for economic, teaching ends and as a source of seeds.

Its major interest is in its usefulness in hydraulic role to protect soils overlaping (overhanging) the valleys of the River Murembwe and the plains of Rumonge.

This project has as well for its objectives to help the population on its outskirts to plant private trees by creating for their own good forest nurseries.

The project implementation shall be given to the Ministry of Agriculture and the contribution of the Government of Burundi and the United States are those in the PID of the above mentioned project.

Sincerely,

MINISTRY OF FOREIGN AFFAIRS
AND THE COOPERATION

Edouard NZAMBIMANA

Annex D

MINISTERE DES AFFAIRES ETRANGERES
ET DE LA COOPERATION

No. 519.1/639/AE

A Monsieur le Représentant de l'USAID

à BUJUMBURA

23 June 1980

Monsieur le Représentant,

Faisant suite à vos lettres no. AAO-80-60 du 26 Mai 1980 et no. AAO-80-101 du 5 Juin 1980, j'ai l'honneur de vous soumettre pour financement par le Gouvernement des Etats-Unis d'Amérique la requête du Gouvernement relative au Projet "Forêt de BURURI".

Ce projet forestier a pour objet la protection du massif forestier de BURURI qui présente divers intérêts en sa qualité de vestige de la forêt primaire, vestige qu'il convient de maintenir à ce titre dans des buts économique, didactique et de source de semences. Son intérêt majeur consiste cependant dans son rôle hydraulique dans la conservation des sols surplombant la vallée de la rivière MUREMBWE et la plaine de RUMONGE.

Ce projet a encore pour but d'aider la population riveraine à installer des boisements privés par la création, à son profit de pépinières forestières.

La mise en oeuvre de ce projet sera confiée au Ministère de l'Agriculture et de l'Elevage et les contributions du Gouvernement du Burundi et du Gouvernement des Etats-Unis sont celles portées dans le Document d'identification dudit projet.

Veuillez agréer, Monsieur le Représentant, l'assurance de ma haute considération.

LE MINISTRE DES AFFAIRES ETRANGERES

ET DE LA COOPERATION

Edouard NZAMBIMANA

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Annex E, Exhibit 1

ACTION MEMORANDUM

TO: AID/W - AFR/DR/CAWARAP

FROM: Terry L. Lambacher, AAO/Burundi AF for TLL

SUBJECT: Project Authorization

Your approval is requested for a grant of $1,144,000 from the Agriculture Rural Development and Nutrition appropriation to Burundi for the Bururi Forest Project, 695-0105.

Discussion: This project will save from destruction the 1,400 hectares of Bururi Forest, an endangered high altitude type of forest along the Zaire/ Nile Crest in Burundi. The forest will be preserved by establishing 1,500 hectares of fast growing trees around the natural forest and in the surrounding area from which the local people collect firewood and building poles. In addition the project will reduce the rate of loss of arable land to soil erosion and increase the availbility of alternative energy sources to the rural and urban poor. Furthermore, efficient wood cooking/heating stoves will be introduced into the area to further reduce the pressure upon the forest.

The factor that most troubles Burundian and endangers this forest is the lack of adequate fuelwood to meet the demands of the rural population, inhabitants of Bururi town, and the requirements of the local institutions. The proposed planting and introduction of an improved cooking stove is expected to result in the preservation of the sole natural fuel source in the Bururi area.

The preservation of such a unique forest is especially relevant in view of the continuing rapid disappearance of much of the world's tropical forests.

Source and Origin of Goods and Services: Goods and services, except for ocean shipping and except as stated in the following paragraph entitled waivers, financed by AID under the project shall have their source and origin in the Cooperating Country or in the countries included in AID Geographic Code 941 except as AID may otherwise agree in writing. Ocean shipping financed by AID under the project shall, except as AID may otherwise agree in writing, be financed only on flag vessels of the United States or the Cooperating Country.

Waivers: AID Geographic Code 935 waiver for vehicle source/origin and 110 (a) waiver of Host Country Contribution Requirement, attached.

Justification to Congress: FY 81 Burundi CP, page 387 (formerly called Agriculture Land Protection).

The Implementing Agency will be the Burundi Department of Waters and Forests of the Ministry of Agriculture.

The Officers responsible for this project will be:

1. AID/W: AFR/DR/CAWARAP, Mr. E.H. Smith
2. AAO/Burundi: Agriculture Development Officer, Harold E. Fisher

Recommendations: That you sign the attached Project Authorization with life of project funding of $1,144,000 of which $414,700 is of FY 81 OYB.

By signing the Project Authorization you will approve the aforementioned waivers. In addition, it is recommended that you sign the Initial Environmental Examination approving the negative determination.

Project Authorization

Name of Country: Burundi

Name of Project: Bururi Forest (ex Agricultural Land Protection)

Number of Project: 695-0105

1. Pursuant to Section 103 of the FAA of 1961, as amended, I hereby authorize the Bururi Forest Project for Burundi involving planned obligation of not to exceed $1,144,000 in grant funds over a four year period from date of authorization, subject to the availability of funds in accordance with AID OYB allotment process to help in financing foreign exchange costs for the project.

2. (a) Source and Origin of Goods and Services: Goods and services, except for ocean shipping and except as stated in the following paragraph entitled waivers, financed by AID under the project shall have their source and origin in the Cooperating Country or in countries included in AID Geographic Code 941 except as AID may otherwise agree in writing. Ocean shipping financed by AID under the project shall, except as AID may otherwise agree in writing, be financed only on flag vessels of the United States or the Cooperating Country.

(b) Waivers: AID Geographic Code 935 waiver for vehicle source/origin and 110 (a) waiver of Host Country Contribution Requirement, attached.

3. The project will preserve one of the last two remaining natural high altitude tropical forests in Burundi (Bururi Forest), and will develop new sources of fire and construction wood in the Bururi area. This project stands by itself with no donors other than USAID involved. The assistance will finance limited participant training, technical, construction and other miscellaneous costs.

4. The project agreement, which may be negotiated and executed by the officer to whom such authority is delegated in accordance with AID regulations and delegations of authority, shall be subject to the following essential terms in addition to standard provisions.

Conditions Precedent

Prior to any disbursement, or the issuance of any commitment documents under the project agreement for the purpose of financing project construction, the Grantee will furnish in form and substance satisfactory to AID: (a) final site plan, construction plan and specifications, and (b) an executed contract for construction services. This condition precedent is for only the AID financed office building and shop/storeroom and not for other technical services incident thereto.

Covenant

The Grantee will covenant, in substance, as follows:

a) To provide individuals to receive participant training in a timely manner.

b) To provide the project manager and the staff and to hire the necessary labor for the project on a timely basis and in accordance with the Project Agreement's Amplified Project Description.

c) To make available the 1,200 hectares of land for the plantations around the Bururi Forest, one hectare of land for the nursery in an appropriate location, and sufficient land for the project houses, office and shop/storage building.

Annex E, Exhibit 3

Action Memorandum for the Assistant Administrator for Africa

Subject: Vehicle procurement waiver (source/origin)

Problem: Request for source/origin procurement waiver from Geographic Code 000 (U.S. only) to Geographic Code 935

a. Cooperating Country: Burundi

b. Authorizing Document: Project Authorization Memorandum

c. Project: Bururi Forest (formerly Agricultural Land Protection) (695-0101)

d. Nature of funding: Grant

e. Description of Commodities:

one (1) pickup truck

one (1) dump truck

one (1) 250cc motorcycle

f. Approximate Value: $52,000

g. Probable Origin: France, Japan, Sweden, U.K., and Federal Republic of Germany

h. Probable Source: Burundi, France, Japan, Sweden, U.K. Federal Republic of Germany

Discussion: Section 636 (c) of the FAA of 1961, as amended, prohibits AID from purchasing motor vehicles unless such vehicles are manufactured in the U.S.A. Section 636 (i) does provide, however that "... where special

circumstances exist, the President is authorized to waive the provisions of this act in order to carry out the purpose of this act". Handbook 1, Supplement B, chapter 5, paragraph 5A, provides that commodities procured under grants must be of U.S. source and origin unless a waiver is obtained The Handbook paragraph 4c2d (1) (b) provides that a waiver may be granted when necessary to carry out the purpose of the FAA and if, inter alia, there is a present or projected lack of adequate service facilities and supply parts for U.S. vehicles. The authority to determine (1) that special circumstances exist for purpose of Section 636 (i) and, (2) that there are adequate justifications for a waiver under Handbook 1, Supplement B, has been delegated to you under Delegation No. 40.

AID is initiating an afforestation project in Burundi in a mountainous area where the grades are sometimes very steep. The project will establish 1,500 hectares of tree plantations which will produce fuel and construction material for the people living in this area. The gathering of wood from the plantations will keep the people out of the natural forest, thus saving it from destruction.

The vehicles will be used to transport the project manager, the advisor, and others plus seedlings and supplies and material, around the project area and between the project area and Bujumbura to assist and support operations.

Experience with U.S. manufactured vehicles in Burundi indicates that neither adequate spare parts nor competent service are available since there are no representatives of U.S. firms here. This situation is exacerbated as vehicles age. AID continues to strongly recommend the purchase of foreign manufactured vehicles which can be serviced locally. Both the Embassy and AID have purchased non-U.S. manufactured vehicles for field use.

Motorcycles: The type of motorcycle to be procured will be a single cylinder (250 cc) model. There are no lightweight motorcycles of this type manufactured in the U.S.A.

You have already granted source/origin waivers for Burundi in the Basic Food Crops Project 695-0101, and in the Peat I 698-0410.09 and Peat II 695-0103 Projects.

For the reasons stated above, it is recommended that you (1) find that special circumstances exist in the case of this vehicle procurement, and do hereby waive the requirement of Section 636 (i) of the FAA and (2) that the exclusion of procurement from Free World countries other than the cooperative country and countries included in Code 941 would seriously impede attainment of the U.S. foreign policy objectives and objectives of the foreign assistance program.

Draft Action Memorandum for the Assistant Administrator

Subject: Host Country Contribution to a Project Problem Request for 110 (a) Waiver of Host country Contribution Requirement of 25 percent and Section 307 of the International Development and Food Assistance Act of 1975.

1. This waiver is being requested due to the following conditions

Burundi is on the UNCTAD list of 38 "relatively least developed countries". The 16 percent contribution pledged by the Government the Republic of Burundi, for forestry projects, is a significant allocation of their scarce financial resources.

The purpose of the Bururi Forest Project is to preserve one of the last two natural high altitude tropical forests in Burundi, and to develop new sources of firewood and construction timber in the Bururi area. It should be noted that the most important factor endangering the Bururi Forest is the lack of sufficient fuelwood in the area to meet the needs of the rural population, the inhabitants of Bururi town and the requirements of local institutions.

2. This project has several valuable components which make it a desirable project for AID financing even though the host country contribution is limited to 16 percent. They are:

a. The conservation of an endangered natural forest, as well as its soil, water, flora and fauna;

b. The establishment of a long term fuelwood source in a rural area with a rapidly dwindling fuelwood supply, through the planting of fast growing species in a belt surrounding the forest.

c. The introducing of cooking stoves, which use woodfuel more efficiently, into an area which has never before used them, often reducing the demand on the fuelwood supply and also further reducing the time women spend gathering wood - thus providing more time for other purposes;

d. To provide, through an observation tour to India, increased GRB capacity to implement innovative procedures for involving local people and government together in afforestation projects; and

d. To introduce for testing newly discovered species of fast growing trees for fuelwood and construction wood production.

3. Financial Country Constraints

With regard to afforestation, the GRB is already allocating a number of available technical experts and a significant budget to ongoing projects of other donors who are concentrating on construction timber production.

The GRB contribution to this project includes $219,064 or 16 percent of the total project cost.

4. Country Commitment

The GRB has an on-going program of encouraging tree planting, by giving free seedlings, to the following groups: the home owner, local government (communal plantations) and also at the national level where well over 10,000 hectares of planting is under way. Furthermore, foresters are being trained at the national agricultural training schools. The Government has also passed laws for the protection of the Bururi Forest which should diminish destruction of the forest. Enforcement may be less than optimum, but is probably quite good considering the circumstances.

5. Nature of the Project

The preservation of a disappearing and greatly endangered high altitude tropical forest plus this introduction of a more fuel efficient cooking stove.

Recommendation: that you approve the waiver.

Approved: _____

Disapproved: _____

Date: _____

Econ

A. Increased Rural Income

It has been estimated that 45 percent of the salary costs of the local residents employed in the nursery and on the plantation establishment crews represents an increased income flow into the area, which is a benefit from the labor intensive method employed for these tasks. This calculation has been based on the difference between the average productivity per worker in the agricultural sector (the "without project" situation) and the wage paid to the laborers ("with project").

This income benefit has been used to represent the economic gains resulting from increased productivity and the multiplier effects of the income flow into the area. It is a conservative estimate as it is only based on the extra value of the income stream provided by employment of the project. Given the high marginal propensity to consume in a subsistence agricultural community, it is likely that the multiplier effect of the extra income will be significantly higher. Employment on the project is not expected to have a negative effect on agricultural production as the work peaks of the two activities do not correspond. In any case, it is expected that men will take most if not all of the laboring jobs while women are primarily responsible for agricultural production.

Although it has not been counted as a project benefit, some longer term jobs will be created in plantation maintenance. There will also be a substantial additional demand for labor at the time trees are harvested as the contractors will probably hire at least part of their work crews locally. This represents a substantial benefit as no cash crops are currently grown in Bururi and, as a result, the opportunities for earning a cash income are even more limited than in other parts of Burundi.

B. Wood Production and the Stoves Program

1. Exotic Species

The value of the exotic species which are to be harvested for construction timber, i.e. pine, cypress and grevillea, has been established based on the current price for a cubic meter (m^3) of sawn timber in situ, i.e. 10,000 FBu. As there are substantial losses in the production process and considerable labor costs involved in sawing timber, a rate of 20 percent of the value of the final product has been applied to determine the stumpage rate hence indicating a price per cubic meter of standing timber of $22. This value has been applied to the expected volume of production and credited to the year in which harvesting is to take place.

2. Eucalyptus Production and Firewood Savings resulting from the Stoves Program

Establishing a value for the eucalyptus wood produced by the project and the firewood saved by the stoves program is difficult, given the lack of a coherent price structure for wood products in Burundi. The official price for a stere of firewood of 300 FBu would result in a stumpage rate of less than $5.00 per cubic meter which is considerably lower than its real value. Conversely, if wood was valued at the rate of the kilocalorie equivalent of the charcoal price in Bururi, the stumpage rate would be nearly $48 per cubic meter, which is too high even if it were reduced somewhat to take account of convenience factors associated with charcoal usage.

Accordingly, the method used by the World Bank to value the eucalyptus production of their forestry project has been employed*. They held that half the current price of charcoal in Bujumbura was determined by the value of the material content and the other half by labor, handling and transportation charges. As the current price of charcoal in Bujumbura is 800 FBu for a 35 kilo bag, and it takes seven** kilos of wood to produce one kilo of charcoal, the 600 kilos of wood (30 percent moisture content) contained in a cm of timber would be valued at approximately $11. The price is equal to the usual price paid for a similar quantity of wood in the project area (650 FBu per stere -- 975 FBu per cubic meter of solid wood or approximately $11) including a delivery charge. As the figure of $11.00 per cubic meter is conservative by comparison to the standing value of similar timber in countries which do not have the supply problems of Burundi, it represents a minimum value figure for the timber. The amounts of wood produced were derived from the volume tables contained in the technical analysis and the benefit has been credited to the year in which the harvest is to take place.

The value of $11.00 per 600 kilos of firewood has also been used to value the wood saved as a result of the stove program. In the latter case, it is used to represent the savings on establishment costs, opportunity costs on the land area over the growing period, plus harvesting, transportation and handling costs.

* World Bank, op. cit., p. 34-35

** This is slightly more conservative than the World Bank approach as they estimated that five kilos of wood were required to produce one kilo of charcoal. However, that yield rate is too optimistic given the current inefficient method of charcoal production used in Burundi.

Annex G

INITIAL ENVIRONMENTAL EXAMINATION

Burundi

Project Title: Bururi Forest

Funding: FY 1981 $

FY 1981-83 $1,366,000

IEE Prepared by: William Garvey, USDA/RSSA

Date: November 1979

Environmental Action Recommended: Negative Determination

Concurrence: /s/ T.L. Lambacher
Terry L. Lambacher
AID Affairs Officer

Bureau for Africa Decision:

Approved: _____

Disapproved: _____

Date: _____

INITIAL ENVIRONMENTAL EXAMINATION

SUMMARY PROJECT DESCRIPTION

This is a conservation project whose dual purpose is (a) to preserve one of the last two remaining high altitude tropical forests in Burundi (the Bururi Forest) and (b) to develop new sources of firewood and construction timber in the Bururi area. To achieve these objectives, planned outputs include:

(a) Protect the 1,400 hectares of natural forest from further encroachment;

(b) Increase the availability of firewood, construction timber and saw timber, as a result of additional plantings in the Bururi area; specifically, a protective ring of forest plantations around the existing forest will produce

- 4,500 m^3 of firewood and construction wood starting in year 15 after planting,

- 3,600 m^3 of pine poles, posts and saw timber per year starting in year 8.

In addition private and communal forest plantings established as the result of the project will produce a minimum of 5,400 steres of firewood, post and poles per year starting in year 5.

(c) Watershed protection in the headwaters of the Mulembwe upstream from the agriculturally important Rumonge plain;

(d) Strengthen institutional capacity of the Département des Eaux et Forêts to achieve sustained future management of the Bururi Forest;

(e) Development of a conservationist outlook (and practical knowledge of forestry plantation establishment and management) on the part of the surrounding population who will participate in the project.

USAID-financed inputs will total $1,366,000 over three years and will include:

(a) Technical Assistance, 8 m/m in 4 short tours by a forester with logistics experience and nursery/ reforestation experiences ($69,440).

(b) Construction - office, nursery facilities, garage, warehouse, ($80,000)

(c) Equipment and Material - pick-up truck, bicycles, tractors, trailers, planting handtools, fencing, POL, training materials, office supplies ($160,350)

(d) Nursery operations, plantation establishment, materials, planting site preparation, replanting ($645,000)

(e) Inflation 15 percent ($267,557)
Contingency 15 percent ($143,217)

Total (rounded) $1,366,000

The GRB will finance personnel and operational costs, construction of staff housing, construction and maintenance of road and trails.

Total: 17,939,641 FBu or $200,331 equivalent, which is equal to 12.8 percent of total project costs.

Environmental Impacts

Direct Favorable Impacts: The following beneficial impacts will result from the project:

-- Protection and preservation of one of the few remaining stands of hihg-elevation tropical forest left in this part of the world.

-- New plantations will reduce erosion, provide watershed protection to adjacent farm and grazing lands, and provide a certain amount of protection from winds.

-- In areas that up to now have repeatedly been exposed to fires (which eventually would reduce the now existing dense grass).

-- Provide, in the foreseeable future, a steady supply of building poles, firewood and saw timber resulting from national management of the forest.

Secondary Favorable Impacts:

-- Provide an example of how development and conservation can be combined in a way that is replicable in other parts of the country where similar situations now exist.

-- Provide, at least for the duration of the project, some income in form of wages to workers employed by the project who otherwise would have little opportunity to earn a cash wage.

-- Provide through a nursery and conservation extension efforts a regular program of tree planting in private and communal lots, which will yield a future supplementary supply of firewood and building poles.

Possible Adverse Impact:

-- The only possible negative impact this project could have is that deliberate and specific efforts will be made to discourage the local population to cut and burn in or around the existing forest. This prohibition is actually not new but perhaps will be enforced more rigorously, even though the GRB maintains that poaching is not currently a problem in the Bururi Forest. Dept. of Water and Forests estimates indicate that sufficient sources of firewood and building poles are available from 375 hectares of national plantations to produce 190,000 m^3 of wood per annum in the Bururi area, approximately equal to the population's total wood needs. The GRB argues that lack of access to the Bururi Forest will not present a burden on local farmers. In any case, any resulting disadvantage would be only temporary and would be completely overcome as soon as wood cutting begins in areas planted under the project (year 5 for eucalyptus and year 8 for pines).

A few simple houses will be constructed for Burundian foresters monitoring the Bururi Forest as well as a garage and small warehouse. Site selection and construction practices will be in accordance with environmental considerations and will be subject to inspection by an AID (REDSO) engineer.

Summary and Recommendations:

The very nature of this conservation-oriented project is to preserve an important natural resource, the Bururi Forest, and to maintain the watershed protection it provides.

The entire project effort is directed toward an improvement of the physical environment and there are no significant adverse long-term effects resulting from activities under the project. In view of these factors, additional analysis of environmental consequences of this project is considered unnecessary and a negative determination is recommended.

Social Analysis of Bururi Forest Project

by Carol W. Dickerman

I. Introduction

The ever-increasing scarcity of wood in the Bururi area is a problem recognized at all levels of the local society, by provincial officials and peasants alike. Everyone to whom we spoke expressed concern about the deteriorating supply of wood and interest in a program of reforestation. The report that follows is based on interviews with government officials and school administrators, talks with peasant women and young girls at the foyer social and the hospital, and visits to a number of rural households, or rugos. The material is presented in three sections: present-day patterns of fuel consumption, effects of a reforestation program, and suggestions for its successful implementation.

II. Patterns of Present-Day Fuel Consumption

There are three separate categories of fuel consumers in the Bururi area, each with its own needs and methods of supply: institutions, town dwellers and peasants.

Institutions

A large number of institutions are located within Bururi Province and consume significant amounts of fuel. There are six secondary schools in the province, a large military camp of over 1,000 soldiers situated just outside the town, and a hospital within the town itself. All of these institutions burn wood for fuel and must purchase large amounts of it for cooking and, in the case of the hospital, for laundry.

At the Ecole Normale Supérieure in Kirembe, for example, food must be prepared daily throughout the school year (264 days) for some 488 students. (Secondary schools provide room and board for students while primary schools do not). All of the school's stoves are wood-burning and one of the school officials told us that preparation of the students' meals requires about two steres of wood a day, or over 500 steres a year. While the official price for a stere of wood is 300 BuF, it is almost never available at this price and usually costs 350 BuF a stere. Transportation of the wood from the lands of private suppliers from whom it is purchased, a distance of perhaps ten kilometers, further increases the cost to almost 650 BuF a stere, or about double the price of the wood itself.

At the Lycée in Bururi, in contrast, the rate of wood consumption is much lower. The sister in charge of the school's finances said that, to provide meals for 388 students, the school purchases from private suppliers 52 steres of wood a trimester, or 156 steres for the school year*.

* This figure is very different from that of the Ecole Normale Supérieure. Both officials, however, checked their figures for us a second time.

She too said that the price of a stere of wood is 350 BuF and that transportation almost doubles its cost. At the hospital, where wood is required year round for meals and laundry, consumption is 40 stere/month or 480/year.

Town Dwellers

The town dwellers who must purchase fuel are its merchants and school teachers, and they most often use charcoal (Government officials, such as the Governor, receive their wood from the military camp). The price of a bag of charcoal is 450 BuF and this amount provides a week's fuel for heavy users. Commerçants ambulants, who have purchased the charcoal from individual producers, come to the teachers and merchants to sell the bags.

Peasants

Rural consumption of wood is of two sorts: wood for cooking, bois de chauffage, and wood for building, bois de construction. The former continues to be free for most peasants, while the latter must be bought.

It is the woman's responsibility to collect the wood for cooking, as it is also her responsibility to prepare the food and to plant and harvest the crops. She will often be assisted by her younger children in gathering the wood, but never by her husband. Some families are able to collect wood on their own lands, but most go into the communal wooded areas to gather it. In large families, wood may be gathered daily by the children, while in smaller families several trips a week suffice. It is the dead, dried branches that have fallen on the ground that are free for firewood. The distance one must go to obtain wood obviously varies. The families living furthest from the road are frequently at an advantage, for the wooded areas near them are often less picked over than the areas close to the roads. Only in exceptional cases must firewood be purchased: the old and sick may hire someone to provide it, purchasing a tree for about 400 BuF or trading crops for wood. Others without easy access to forest areas may also enter into a similar agreement.

For bois de construction, on the other hand, a live tree must be purchased. Demand is highest after the harvest, during the dry period from June to September. At this time of year peasants are most likely to have crops to trade or money to purchase wood and to occupy themselves constructing and repairing the buildings of the rugo. Obtaining the wood and carrying out the construction is a man's task. When his sons are old enough to be married, the need for bois de construction and for their help will be particularly high, as there must be a separate house in the rugo for each son and his wife. The wood may be purchased from a rich neighbor who has trees to sell or, when wood is not available nearby, from a communal forest. One man told us that he had just paid a wealthy neighbor 1,500 BuF for a tree, plus 400 BuF to another man to cut the tree into planks: he plans to re-sell the planks to one of the building societies, such as AMSAR in Bururi.

Both officials and peasants said that only for bois de construction, and never for bois de chauffage, is a live tree cut. (But dead wood for bois de chauffage can be produced by taking cuts at live trees over a period of time until they die and can be legally collected as firewood). In addition, we were told that permission must be obtained to cut live trees and that the area designated as the Bururi forest is closed for this purpose. Officials also assured us that no one can go into the forest and that monitors and other officials enforce this ban. This appears, however, to be true in theory rather than in practice, for there are a number of trails leading into the forest which appear to receive continued use. Although it is customeray for peasants to have the right to gather dead wood in communal forest areas, it appears that the Bururi forest either now is, or is presently, to be closed to all local use.

III. Effects of the Reforestation Program

Hardships

The very obvious hardship that will be caused by the reforestation program is directly related to the extent to which the Bururi forest is now genuinely closed. If, indeed, no one any longer obtains either bois de chauffage or bois de construction from the forest, then the program should not cause a sudden drop in the wood supply or a rapid rise in prices. However -- as is more likely the case -- if the implementation of this program results in the forest being successfully closed to local access for the first time, then prices for bois de construction will certainly rise and bois de chauffage may suddenly be available only by purchase. It is unfortunately impossible to gauge the extent to which the forest continues to be used as a source of firewood. Because everyone is aware that the forest has been closed, reliable estimates of present-day use, if any, are unobtainable. Most of the peasants apparently obtain firewood from areas other than the Bururi forest, but closure of the forest for the first time could well have a ripple effect, forcing those nearby to rely on other declining sources of wood, and in turn pushing their neighbors into other marginal areas. If bois de chauffage ceases to be a free good, then peasants will obviously have no choice but to pay or trade for firewood, and the hardship will be greatest for those nearest the forest and those whose lands are already inadequate.

Neither coffee or tea is grown in Bururi, and several families to whom we spoke mentioned that they already must trade or sell food crops to obtain what they cannot grow or gather themselves. Widows, without husbands to assist them, are in particularly dire straits, as are other families where there is no cash income and where land holdings are small. Firewood will have to be obtained from the further sale or barter of barely adequate food crops. For most, unless some means of obtaining income is available, there will be no alternative to reducing the amount of food they themselves have to survive.

For the schools, hospital, and military camp, the forecast is perhaps less grim, but they too will be forced to pay increased prices for wood unless an alternative fuel source can be introduced. Peat is perhaps an obvious substitute for these large institutions. It will have to be seen, though, if their stoves, in which large amounts of money have been invested, are suitable or can be adapted for peat.

Charcoal producers and users will also be affected by the closing of the forest: independent producers and consumers may find the raw material scarcer or more expensive to purchase and those who produce charcoal on contract may find less demand for their services. At present, marchants may pay a license fee of 27,000 BuF to the Government for permission to produce 900 sacks of charcoal from a designated area of state land. The merchant in turn hires someone to manufacture the charcoal for approximately 150 BuF per sack. After transporting the sacks to a market or to individual consumers, the merchant can demand 450 to 700 BuF per bag. Only a part of the charcoal is sold locally, and those who sell further afield may well transfer their place of production to another area of the country, thus depriving the hired workmen of this source of income. (There is no comparable permit to use state lands for private wood suppliers).

Compensations

It is expected that the Bururi forest project will provide the equivalent of 400 full-time jobs, a by no means smaller fraction do so year round. Of the forty-three households we surveyed, less than one quarter (ten) had men who earned a full-time salary. These ten were prosperous households and the two in which both father and sons had jobs were very well stocked, with a number of cows, chickens and chicken houses, and several modern houses. Jobs with the project, even if of a seasonal nature, will benefit a number of families. The opportunity for employment should not interfere with the planting and harvesting of crops, primarily the women's responsibility. October and November are the best months for tree planting, while most of the food crops are planted at other times of the year and usually harvested in June and July. (Only maize is planted in October; sorghum is planted in January, vegetables in February and wheat in April). At the very least, income generated from employment in the project will help to offset increased wood costs. Although obtaining bois de chauffage is likely to remain the women's responsibility, the money for its purchase could well be provided by the man's wages.

Other suggested benefits of the project are the sale of seedlings to individuals and the provision of more efficient stoves. Both ideas would appear to have a high chance of success. The peasants we talked to were very interested in being able to obtain seedlings even if required, they said, to pay up to 5 BuF each. The agricultural station has begun in the past three years to provide seedlings free to peasants, and demand for them has continued to exceed supply. Two of the men to whom we spoke hoped that the seedlings would be of various kinds, some useful for bois de chauffage, eucalyptus perhaps, and others best for bois de construction. They also suggested that

information on the care of the seedlings be made available; one man showed us where the wood in his house and of the fence around the rugo was being eaten by bugs and hoped that something could be done to prevent continued insect damage. Women as well as men were interested in obtaining seedlings; one widow, who lives alone, said that although she could not plant them herself, she had enough and her neighbors could plant some for her. (They already help her and come every Thursday to work on her new house).

The women were also interested in learning about new stoves. Cooking is traditionally done on three large stones, either in a separate cooking shelter or in one of the rooms of the house (if it has a tin roof). None of the women to whom we spoke seemed particularly to cherish this method; they said they would be interested in a new variety of stove as long as they could continue to use wood as fuel. Certainly the acceptance of a new variety of stove will be affected by how cheaply the new model can be acquired, how efficient it is, and how expensive bois de chauffage becomes

IV. Suggestions for Successful Implementation of the Project

Local interest in a reforestation program is high; both peasants and officials are concerned about decreasing wood supplies and are interested to find ways in which to offset the losses. But while the project is intended to remedy the wood shortage, the first critical years of the program may well serve to aggravate rather than to improve the situation. Local acceptance of this hardship could perhaps gained through a thoughtful program or education and assistance.

Already existing organizations such as the agricultural station, the foyer social, and the hospital and schools could plan important roles in such a program. The foyers sociaux, for example, offer classes in literacy, cooking sewing, household management, health and agriculture to young people. There are six such centers in Bururi Province, at Bururi, Rumeza, Rutovu, Kirembe, Kayogoro and Mugara. Although short-staffed at present, they attract large numbers of people to their courses and are able to reach all educational levels. A new design of stove could be introduced to young girls in cooking and household management courses; the girls in turn could tell their mothers, who have little time for such classes. Young girls at the foyers might also be taught to make banana leaf baskets, suggested as an alternative to plastic bags to protect the seedlings and as a possible source of income for peasant families*. The hospital, which offers courses in nutrition and pre-natal care, is another place where a new stove might be demonstrated. Both of these organizations have the confidence of local people and should be used to introduce and explain innovations. While there certainly is an element of self-selection involved in choosing to attend these classes, those who do so represent the part of the population perhaps most respective to change and willing to try new stoves or to make banana leaf baskets.

* While Bururi is rich in banana leaves and the idea of producing such containers seems acceptable, no one as yet knows how, the suggestion having come from an AID consultant who saw such baskets in Zaire.

The agricultural station might similarly be used to distribute seedlings and to convey information about their care. It already performs such functions in its own program of reforestation and is in contact with agricultural monitors who have been appointed for each colline. Increasing the availability of seedlings, even at the price of several francs a piece, would be an important way to demonstrate the importance and individual benefit of a program of reforestation.

Annex I, Exhibit 1

Project Expenditures - Bururi Forest - U.S. Government (U.S.$)

	Year 1	Year 2	Year 3	Year 4	Total
Personnel					
Forestry Advisor	8,680	26,040	17,360	17,360	69,440
Stove Consultant(s)	26,040	-	-	-	26,040
Stove Engineer (local hire)	2,500	2,500	-	-	5,000
Forestry Consultant (Testing Program)	-	17,200	-	-	17,200
Other Consultant Services	17,360	8,680	8,680	8,680	43,400
	54,580	54,420	26,040	26,040	161,080
Participant Training	45,000	-	-	-	45,000
Capital Investment					
Construction	73,000	-	-	-	73,000
Stove Materials	3,000	3,000	3,000	3,000	12,000
Seeds for Testing Progr.	1,000	-	-	-	1,000
Vehicles	127,000	-	-	-	127,000
Office Furnishings and Supplies	10,000	-	-	-	10,000
	214,000	3,000	3,000	3,000	223,000
Other Costs					
Nursery and Plantation Establishment	-	65,400	73,060	58,860	197,320
Vehicle Maintenance	4,020	8,380	15,700	19,800	47,900
Plantation Maintenance	-	-	14,400	18,300	32,700
P.O.L.	1,400	15,000	15,000	15,000	46,400
	5,420	88,780	118,160	111,960	324,320
Total	319,000	146,200	147,200	141,000	753,400
Inflation	47,850	47,150	76,700	105,600	277,300
Contingency	47,850	21,950	22,100	21,400	113,300
Grand Total	414,700	215,300	246,000	268,000	1,140,000

Annex I, Exhibit 2

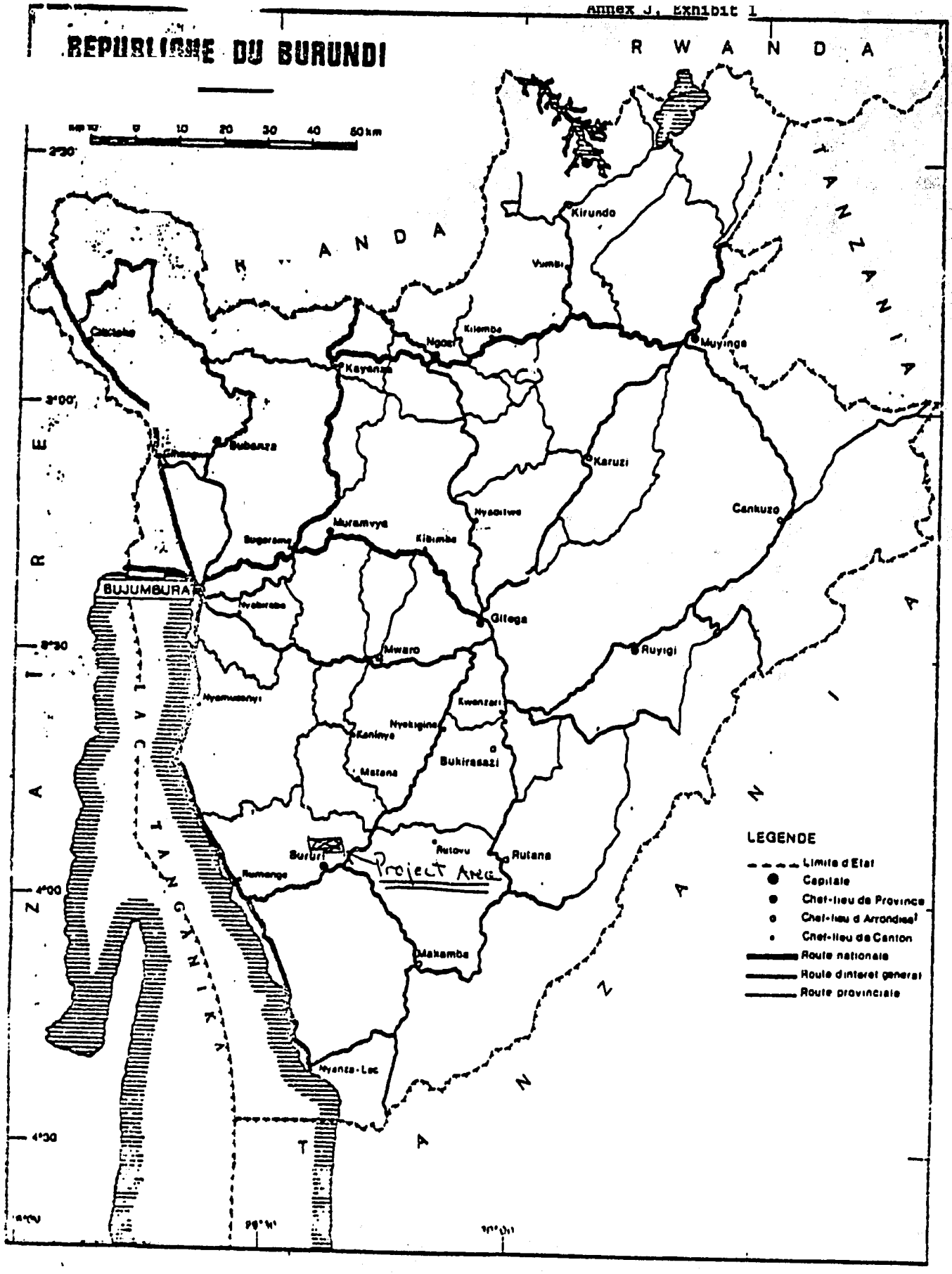
GRB BUDGET

Items	Year 1 (BUF 000)	Year 2 (BUF 000)	Year 3 (BUF 000)	Year 4 BUF 000)
Personnel				
1 Forester	168 *	336	336	336
1 Asst. Forester	30	180	180	180
3 Forestry Monitors	48	288	288	288
3 Monitor Helpers	27	162	162	162
1 Accountant	40	240	240	240
1 Mechanic	30	180	180	180
2 Drivers	48	288	288	288
2 Asst. Drivers	-	240	240	240
Sub-Total	(391)	(1,914)	(1,914)	(1,914)
Construction				
3 Staff Houses	6,000	-	-	-
Trails	121	93.2	52.9	-
Firelanes	-	30	34	39
Sub-Total	(6,121)	(123.2)	(86.9)	(39)
Maintenance				
Buildings	-	180	180	180
Trails	-	30.2	53.6	67
Firelanes	-	-	5	10
Sub-Total	(-)	(210.2)	(238.6)	(257)
Total	6,512	2,247.4	2,239.5	2,210
Inflation (15%)	977	724.8	1,166.5	1,655.3
Contingency (15%)	977	337.1	336	331.5
Grand-Total	8,466	3,309.3	3,742	4,196.8

The total GRB budget for the life of project is equivalent to $220,145.9 or 16 percent.

* Personnel costs in year 1 are for 6 man months (mm) of service by the forester and 2 mm services from all other personnel.

Annex J, Exhibit 1



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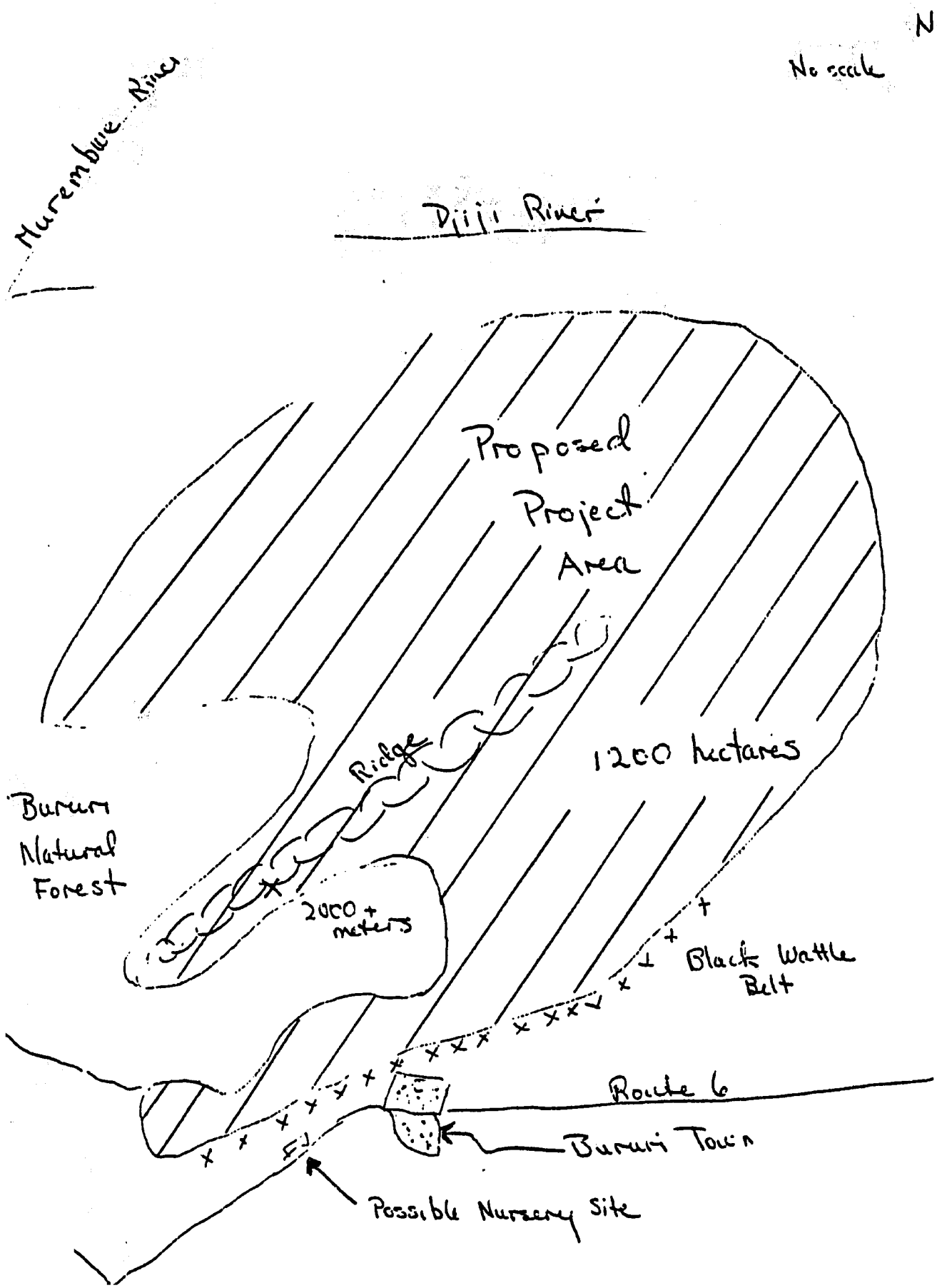
BURUNDI
BURURI FOREST SITE MAP



OPTIONAL FORM NO. 10 5010-104
MAY 1962 EDITION
GSA GEN. REG. NO. 27

UNITED STATES GOVERNMENT

Memorandum

Annex K

TO Terry L. Lambacher, AAO/Burundi DATE: February 17, 1981.

FROM Pushkar Brahmbhatt, REDSO/EA Engineer

SUBJECT Bururi Forest (695-0101)
611 (A) FAA 611 (A) Satisfaction for proposed AID-financed project construction

1. The construction proposed for AID financing will include about 100 sq. mt. office block, 150 sq. mt. garage/warehouse block and a 20 sq. mt. nursery facility. A wood frame type construction with C.G.I. roofing sheets will be applied. Design, supervision and construction of all the proposed facilities will be the responsibility of Ministry of Public Works.

Prior to beginning of construction a REDSO engineer will be responsible for the approval of site plan and engineering drawings for the proposed facilities.

The total estimated cost of construction is $80,000. The average construction cost is estimated between $300 to $350 per sq. meter. Overall inflation and contingency of 15 percent each is added to the above basic cost estimates.

2. REDSO engineer believes that the proposed facilities are adequate for the project requirement and the cost estimates are reasonably firm to satisfy requirement of FAA 611 (A) as amended.