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AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D.C. 20523

INDIA
MADHYA PRADESH SOCIAL FORESTRY
PROJECT PAPER
386-0475

SEPTEMBER 1981

UNCLASSIFIED

PROJECT DATA SHEET

1. TRANSACTION CONTROL

A = Add
C = Change
D = Delete

Amendment Number

DOCUMENT CODE

COUNTRY/ENTITY
INDIA

3. PROJECT NUMBER
386-0475

BUREAU/OFFICE
ASIA **04**

5. PROJECT TITLE (maximum 40 characters)
MADHYA PRADESH SOCIAL FORESTRY

PROJECT ASSISTANCE COMPLETION DATE (PACD)
MM DD YY
03 31 87

7. ESTIMATED DATE OF OBLIGATION
(Under "B." below, enter 1, 2, 3, or 4)
A. Initial FY **81** B. Quarter **4** C. Final FY **83**

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

A. FUNDING SOURCE	FIRST FY 81			LIFE OF PROJECT		
	B. FX	C. L/C	D. Total	E. FX	F. L/C	G. Total
AD) Appropriated Total	400	3,600	4,000	400	24,600	25,000
(Grant)	(400)	(600)	(1,000)	(400)	(600)	(1,000)
(Loan)	(-)	(3,000)	(3,000)	(-)	(24,000)	(24,000)
Other						
U.S.						
Host Country		3,000	3,000	-	25,000	25,000
Other Donor(s)						
TOTALS	400	6,600	7,000	400	49,600	50,000

9. SCHEDULE OF AID FUNDING (\$000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	C. PRIMARY TECH. CODE		D. OBLIGATIONS TO DATE		E. AMOUNT APPROVED THIS ACTION		F. LIFE OF PROJECT	
		1. Grant	2. Loan	1. Grant	2. Loan	1. Grant	2. Loan	1. Grant	2. Loan
1) FN	B-233	160	160	-	-	1,000	3,000	1,000	24,000
2)									
3)									
4)									
TOTALS				-	-	1,000	3,000	1,000	24,000

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

11. SECONDARY PURPOSE CODES

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

A. Code

B. Amount

13. PROJECT PURPOSE (maximum 480 characters)

To create the institutional capability to assist villagers to manage communal and private land for sustained production of forestry products.

14. SCHEDULED EVALUATIONS

Interim MM YY MM YY Final MM YY
03 83 03 85 03 87

15. SOURCE/ORIGIN OF GOODS AND SERVICES

000 941 Local Other (Specify)

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

17. APPROVED BY
Signature *Priscilla M. Boughton*
PRISCILLA M. BOUGHTON
Title **MISSION DIRECTOR**
USAID/INDIA
Date Signed MM DD YY
07 06 81

18. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION
MM DD YY
07 06 81

INDIA - MADHYA PRADESH SOCIAL FORESTRY

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CURRENCY EQUIVALENTS

Currency Unit	=	Rupees (Rs.)
U.S. 1	=	Rs.8.00
Rs.1	=	U.S. \$0.125

WEIGHTS AND MEASURES

1 kilometer (km)	=	0.62 miles
1 meter (m)	=	3.28 feet
1 hectare (ha)	=	2.47 acres
1 kilogram (kg)	=	2.20 pounds
1 metric ton (MT)	=	2,204 pounds

INDIAN FISCAL YEAR

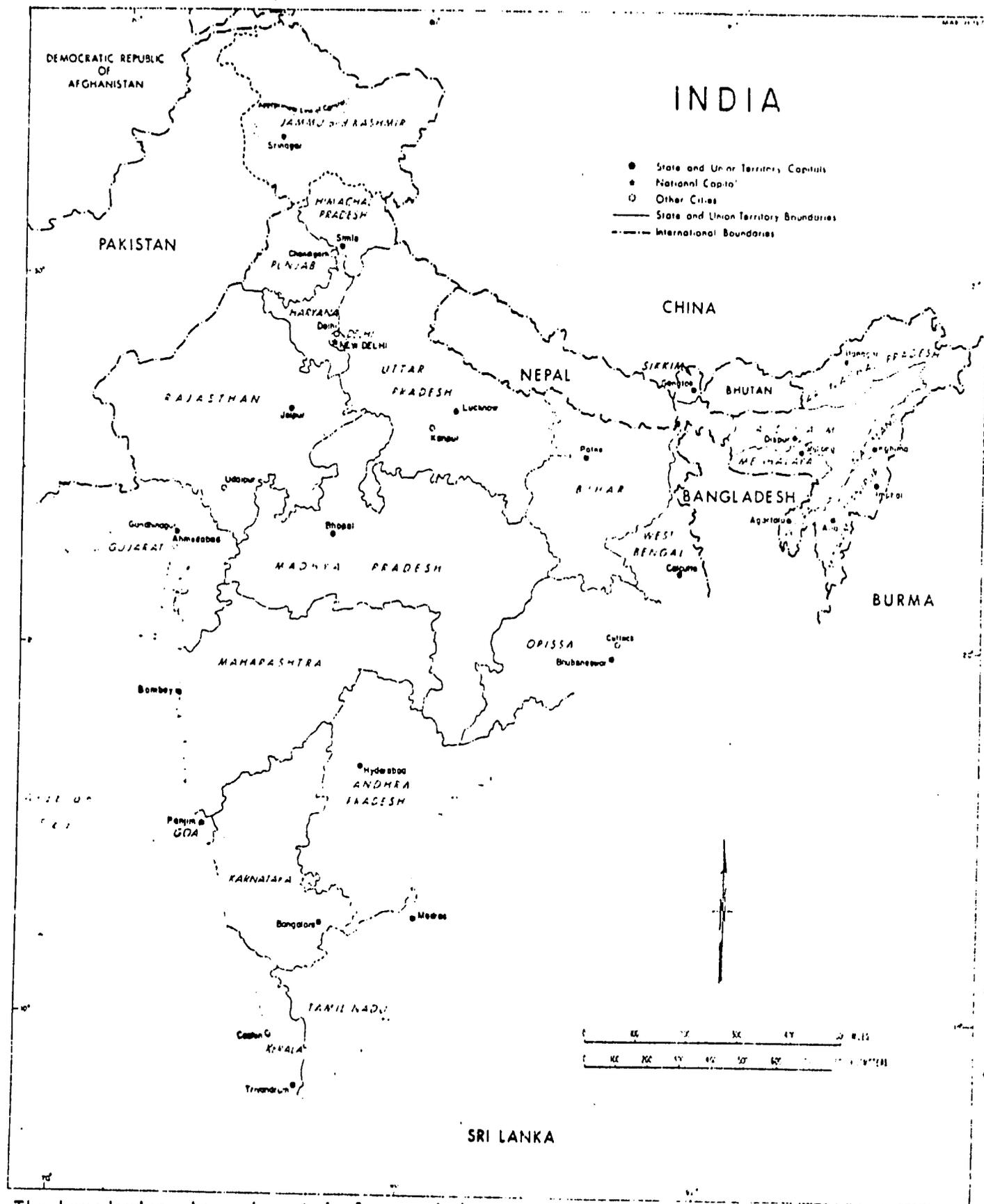
April 1 - March 31

ABBREVIATIONS AND ACRONYMS

ACCF	-	Assistant Chief Conservator of Forests
Addl. CCF	-	Additional Chief Conservator of Forests
BDO	-	Block Development Officer
CCF	-	Chief Conservator of Forests
FRI	-	Forest Research Institute
GOMP	-	Government of Madhya Pradesh
ICAR	-	Indian Council of Agricultural Research
IEE	-	Initial Environmental Examination
MP	-	Madhya Pradesh
MPFD	-	Madhya Pradesh Forestry Department
NCA	-	National Commission on Agriculture
NCAER	-	National Council of Applied Economic Research

DEFINITIONS

Block	-	A development area below the size of a district comprising about 100 villages.
Block Development Officer	-	State Government official responsible for all developmental activities in a Block.
Nistar	-	Villagers' customary rights of forest usufruct.
Panchayat	-	Village-level institutions consisting of elected representatives.
Sarpanch	-	Head of a panchayat.
Janpad Panchayat	-	Block-level institutions consisting of elected representatives.
Van Vistar Adhikari	-	Forestry Extension Officer
Sahayak Van Vistar Adhikari	-	Assistant Forestry Extension Officer
Van Sewik	-	Extension Worker



The boundaries shown do not imply any judgment on the part of the U.S. Government on the legal status of any territory or any endorsement or acceptance of such boundaries.

MADHYA PRADESH SOCIAL FORESTRY PROJECT
(386-0475)

PART I PROJECT RECOMMENDATION AND SUMMARY

A. Recommendation

Approval of a loan for a social forestry extension organization and reforestation program in the state of Madhya Pradesh; and a grant to finance training and technical exchanges.

1. Borrower: The Government of India

2. Implementation Agency: The Madhya Pradesh Forestry Department.

3. Financing

a. AID Contribution: Loan of \$24 million
 Grant of \$1 million

b. AID Loan Terms: Repayment of principal and payment of interest within 40 years, including a 10-year grace period of repayment of principal, with interest of two percent (2%) per annum during the grace period and three percent (3%) thereafter.

c. Borrower Contribution: \$25 million equivalent.

d. Total Cost: \$50 million.

B. Project Summary

Social forestry in India emphasizes forestry at the local level by and for the village community. The goal of the Madhya Pradesh Social Forestry Project is to increase the supply of firewood, fodder, fruit, small timbers and other minor forest products through social forestry. The project will be implemented in fuel deficient regions of the state which because of deforestation are short not only of energy and fodder but of the small timbers, medicinal herbs and other products used in the household. The purpose of the project is to create the institutional capability to assist villagers to manage communal and private land for sustained production of these products. This will be accomplished through establishment of a forestry extension organization, the Social Forestry Directorate (SFD).

The average rural household in Madhya Pradesh (M.P.) uses 950 kg. of firewood, 1052 kg. of dungcake and 250 kg. of crop residues annually. Most of this energy is used for cooking and heating water. In the northern and western parts of M.P. increased population pressure, overgrazing and lack of management have resulted in severe deforestation and degradation of village common land and adjacent government lands. In many cases private lands have suffered a similar fate. Whereas previously sufficient firewood, fodder and other forest products could be found near most villages, now it is necessary to travel 2-3 kilometers and in some cases 12 kilometers in each direction to obtain these products. Currently firewood deficits exist in 26 of the state's 45 districts. By the year 2000 the deficit area will include 39 districts and involve 90% of the population. This project will address the underlying problem of inadequate management systems for the common lands as well as the symptoms of the problem, i.e. deforestation and resulting shortages of fuel, fodder and other forest products.

Over a 6-year period the project will (1) establish an extension wing, the Social Forestry Directorate, in the Madhya Pradesh Forestry Department (MPFD); (2) establish forest plantations near villages, and along road, rail and canal sides; and (3) provide seedlings to increase forest production on private land. The project will also permit the Government of Madhya Pradesh (GOMP) to provide a single management entity for a number of existing socially-oriented forestry programs aimed at tribals and other rural poor. Most importantly, it will establish a management system for sustained communal fuelwood and fodder production utilizing both village and government owned, defacto, 'common' lands.

The management system to be developed and implemented by the Social Forestry Directorate will include: (1) an extension program which will provide information and training at the District and local levels; (2) an implementation program, which will provide logistical support to the extension program through seeds and seedling production; (3) an information and problem solving network, which will be comprised of advisory committees at the various administrative levels, a monitoring and evaluation unit, and an applied research program; and (4) an administrative program, which will provide overall program direction and coordination.

A grant of \$1 million will be provided for training and technical exchange. In-service training programs for MPFD

personnel will be developed in both the social and forest sciences. Selected personnel will be sent abroad for special 2 to 12 month programs which will include both study tours and formal education. A US organization and an Indian counterpart organization will be selected to develop and coordinate training programs and to provide technical expertise both for program development and evaluation.

Implementation will ultimately require a staff of about 3300 comprised of 80 gazetted officers, 30 research personnel, 1800 extension personnel and 1390 sub-professional support personnel.

The project will be expanded over a six year period. The first year of operation will involve recruiting 300 staff and planting about 1425 hectares (ha). During the second year, the staff will increase to about 1200 and the planting program to 2900 ha. Effort during these two years will center on training, building extension and research programs, and initiation of pilot operations in 4 of the more fuel deficient districts of the state. In the remaining four years, program emphasis will shift to full scale extension and planting operations. During the final year more than 20,000 ha of mixed species plantation will be established through cooperative efforts between the Forestry Department and local villagers. This will bring the total area planted in the 29 districts where firewood supplies are 50 percent or less of demand, to almost 65,000 ha. More importantly, at the project conclusion, a fully operational organization, and a trained staff of 3300 with 5 years of experience (as well as supporting physical plant with nurseries fully stocked) will be ready for continued expansion.

The project is intended to serve as a catalyst for obtaining the support and participation of villagers in the establishment and management of village plantations. Training, demonstration plantations and technical assistance will be key elements in the extension program. Initial project success will be measured by the villagers' willingness to contribute community land and ultimately to take over and successfully manage village plantations.

The project is expected to supply 25% of the current annual firewood needs in 5000 villages. Mixed plantations supplying firewood, fodder, small timber, fruit and other minor produce will be planted on 63,450 ha of degraded land. Fodder production from these ungrazed plantations is projected to more than equal forage produced from the same previously unprotected and ungrazed area. Free seedlings will be provided to farmers to increase production

on private lands. Rural employment will increase an estimated 30 million person days. Women in rural areas are expected to benefit significantly in terms of employment as they are traditionally involved in planting and tending operations. When the plantations are in production and firewood and fodder are more available, the work and time spent by women collecting these products will be reduced.

C. Project Issues

The principal issues raised in the PID review are stated in the AID approval cable reproduced in Annex 1. Below is a brief summary of these issues and their treatment in terms of project design.

Participation

Motivation and participation of villagers and other government agencies is a central concern of the project design. Forestry Department staff training will be structured to not only emphasize the importance of participation but to develop a basic understanding of the socio-economic factors which will influence participation. As shown in Section III A-4 (training), the proposed curriculum includes both basic sociology and extension methodology with particular emphasis on communication and motivation. Section III A-2 describes the role of the Interdepartmental Policy Committee in coordinating the work of various government agencies and enhancing communications between local people and the Social Forestry Directorate. This same Policy Committee will be responsible for designing the Forestry Department - Panchayat Agreement which will define the rights and responsibilities of both parties in the establishment and maintenance of the panchvans or village wood lots.

The Forestry Department Panchayat agreement described in Section III E-3 will also describe the participatory role the panchayat must play before it assumes full responsibility for management of the panchvan. Section III E-4 describes production of seedlings in school nurseries which provides children with an opportunity to participate in the program. Finally, in regard to the APAC concern regarding the use of inefficient government nurseries, it should be emphasized that nursery costs are projected at \$31.0 per 1000 plants. Sixty percent of this cost (\$18) is day labor. Most of the nursery labor is provided by women who earn less than 5 rupees (\$0.70) per day. Since creation of employment is an objective of the project, these costs do not seem excessive.

Livestock Grazing

The economics of panchvan production and the preferences of villagers for different products were carefully analyzed. The details of the analysis are contained in Annex 2. As a consequence of this analysis, multiproduct panchvans rather than firewood plantations were emphasized in project design. Villagers require green fodder, grass, fruit, small timbers etc. in addition to firewood. In response to the APAC concern for loss of grazing land due to panchvan establishment, it should be recognized that the area panchvans will occupy will be a small fraction of the total land used for grazing. Because the productivity of grazing land in its present condition is so low, panchvan development, which requires fencing areas that excludes grazing, should result in increased vigor of the plants. The increased vigor, together with proper timing of harvest will increase the grass yields. Grass produced in the panchvan will be cut by hand and used for stall feeding cattle. The combination of green fodder and grass when the panchvan reaches full production will be substantially greater than the production possible under the current wasted condition of land.

For areas where especially acute shortages of forage exist, silvipastoral plantations have been incorporated in the project design (see breakdown in Annex 3). Grass is the primary product from these plantations, but some firewood, green fodder and fruit will also be produced.

Firewood Subsidies

The GOMP does subsidize shipment of firewood from Forest Department lands to both rural and urban areas with firewood deficits. Of the 1.8 million Metric Tons (MT) (2.3 million m³) of firewood removed from Forest Department land in 1978, 134,000 MT (168,000 m³) were supplied to 160 cities in the state and a similar amount to rural areas. While these shipments do moderate local prices, their magnitude is less than 4% of estimated consumption on a statewide basis. Hence the overall significance of subsidies is small and can be expected to decrease as potential demand increases with population expansion. However, given the potential significance of subsidies and intrastate shipment of firewood to social forestry, this topic will be given further examination (see Section III A-4 Research).

PART II

BACKGROUND AND RATIONALE

A. Forestry in India

About 75 million ha of land (185 million acres) or 23% of India's area, is classified as forest. However, only 40-50% of this area is actually under adequate tree cover, and an estimated 20 million ha (49.4 million acres) is seriously affected by erosion. Thus no more than 12% of India's land area is forested, as against a target of 33% recommended in the National Forest Policy of 1952. In terms of per capita forest area (about 0.5 ha), India ranks among the lowest in the world. The remaining indigenous forests are concentrated in the "Dome Area" of central India (Madhya Pradesh, Maharashtra, Andhra Pradesh and Orissa), the western Himalayas (Uttar Pradesh, Himachal Pradesh and Jammu and Kashmir), and the northeast (Assam and the other Indian states and territories to the north and east of Bangladesh). Coniferous forests comprise only about 5% of the forest area. Over 90% of the forests are owned and managed by the Government.

Forestry is an old and well-established activity in India. In 1865 the first Indian Forestry Act was passed to regulate exploitation of forests. A statement of National Forest Policy issued in 1894 emphasized the need to demarcate and conserve forests. A revision was issued in 1952 emphasizing the role of forestry in environmental protection. The importance of improving the productivity of Indian forests was not generally recognized, however, until the early 1970s, when the National Commission on Agriculture (NCA) began its extensive review of India's forestry prospects and policies. Based on NCA projections to the year 2000, existing plantation programs will adequately meet industrial hardwood demand, but would meet only about half the demand for coniferous pulpwood and perhaps two-thirds of the demand for fuelwood. To ensure an adequate supply of pulpwood, 500,000 hectares (1.23 million acres) would have to be planted by 1994; to meet the demand for fuelwood, an estimated 450,000 hectares (1.11 million acres) would have to be planted annually. This compares with the establishment of an estimated 3.7 million hectares (9.1 million acres) of forest plantations since Independence, of which approximately 1.5 million hectares (3.7 million acres) was planted during the period of the original Fifth Five Year Plan (1974-79). (For additional details on India's forestry sector, see IBRD, "India: Forestry Prospects", Report No. 1745 - IN, April 1978).

The final NCA report (1976) recommended that India's strategy for forestry development focus on a "production forestry" to supply the growing needs of the domestic wood products industry and "social forestry" to supply fuelwood, fodder, small timber and other forest products to the rural population. It further recommended that each state reorganize its Forestry Departments into Production Forestry and Social Forestry wings. Many states have now done so, and large-scale social forestry projects are now under way with World Bank assistance in the states of Gujarat and Uttar Pradesh. The Sixth Five Year Plan (1980-1985) states that

the main objectives of the forestry programme.. will be the conservation of existing forests and the launching of country-wide afforestation and social forestry programmes In conformity with this objective the major area of thrust will be the promotion of a people's forestry movement. (p.136)

Programs in the Sixth Five Year Plan which will support and complement social forestry include establishment of a Forest Survey of India (FSI) to provide reliable information on existing and potential forest resources; establishment of an autonomous Institute of Forest Management (probably at Bhopal, Madhya Pradesh); expanded forestry research programs at the Dehra Dun Forest Research Institute (FRI), at institutes under the Indian Council of Agricultural Research (ICAR), and at State Forest Departments and agricultural universities; establishment of a Division of Forestry Extension at FRI; extensive tree plantings under the National Rural Employment Project (food-for-work) and under the program for an Eco-Development Force made up of ex-servicemen; and a "Tree for Every Child Programme" to be carried out through the schools. Total allocations for forestry activities under the Sixth Plan are \$866 million, or 0.7% of total public sector Plan allocations.

B. The State of Madhya Pradesh

Madhya Pradesh lies in the geographical heart of India. With an area of 442,841 square miles (44.3 million hectares), which is slightly greater than California, it is the largest Indian state. Its western edge verges on desert; its eastern edge touches the humid tropics. The terrain is generally rolling with occasional low ranges and the great valleys of the Narmada and Mahanadi rivers. Topographic relief varies from 100 to 1400 meters. Black alluvial soils dominate the low lands; gravelly soils predominate at higher elevations. Rainfall in M.P. annually averages from 1000 mm in the west to 1400 mm in the east. Ninety percent of this precipitation

occurs during the monsoon between late June and early October. Because of the temporal distribution of rainfall and the intense heat of the dry season preceding the monsoon, vegetation within the state is more characteristic of a semi-arid climate than would normally be found in areas with 1000 mm of rainfall. Thorn, dry deciduous and moist deciduous forests are the major forest types within the state.

Madhya Pradesh was created as a political entity in 1956 from land previously under the British Raj or part of princely states. It is a rural, agricultural state marked by severe poverty and underdevelopment. Eighty four percent of its approximately 52 million inhabitants live in 76,000 rural villages. Two-thirds of these villages have fewer than 500 persons. The average farm size is 4 hectares. The population is predominately Hindu but there are large numbers of Muslims. Thirty-five percent of its population is made up of "scheduled castes" or "scheduled tribes". Scheduled castes are the lower castes in the hierarchal caste system and together with the tribal people constitute most of the lower economic strata. The average life expectancy is 53 years for men and 51 years for women. This reflects generally low health standards and nutritional levels. Child mortality is the third highest in India. Rates of foodgrain production, infrastructure development, and irrigation expansion are the lowest in the nation. Madhya Pradesh receives the lowest level of per capita public assistance for industrial development among the major states. Per capita income of 1978 was 896 rupees, (about \$112) compared with a national average of 1163 rupees (\$145).

Social relationships are dominated by the caste system, although since independence a more democratic tradition has been evolving. Madhya Pradesh is divided into 45 districts, each headed by a collector, an appointed official. Each District has approximately 10 development Blocks each governed by a Janpad Panchayat, an elected, statutory body which oversees development activities including extension programs. A typical block is further subdivided into an average of 30 village (gram) panchayats each administering approximately 5 villages. Panchayats have 10 to 25 elected members headed by a Sarpanch. Statutory provisions reserve 2 seats on the panchayat for women and minimum of 1 seat for scheduled tribals or scheduled castes:

C. Forestry, Deforestation and Rural Energy Use

The forests of M.P. are extensive, comprising approximately 25% of all forest land in India. They were exploited during the colonial period by the British who drew heavily on them for export but also initiated management programs for commercial species such as teak, sal and bamboo. Today the state government draws more than 15% of its

annual revenue from these lands. Most of the revenue is derived from timber sales (teak, sal), bamboo sold for pulp, and tendu leaves used for Indian bidis or cigarettes. The remainder comes from the sale of minor forest products and firewood. Of the 15.6 million hectares of state land (35% of total state land) legally classified as forest, 30 percent has been reduced to brush or grassland. Growth in the human population and in the numbers of livestock, has resulted in increasing agricultural encroachment and harvesting of fuel and fodder. Over the last 20 years more than 1.9 million hectares of forested land has been lost to settlement or other land uses or degraded due to these pressures. Much of this degraded land lies near the villages and has been used as common land along with land owned by the village. A decade or two ago these lands were sufficient to supply much of the needed firewood, greenfodder, and wood for farm implements and housing. In many villages it is now necessary to travel 2-3 km., and not infrequently 10-12 km. to obtain these same products. This is the genesis of the village firewood shortage in Madhya Pradesh.

At the state level, the critical nature of both rural and urban fuel needs is appreciated. It is estimated that since 1975 an average of 65 percent of the wood volume produced annually on state lands has been used as fuel. The exact percentage is difficult to determine because of the common village practice of obtaining firewood in headloads from the nearest available source. Accounting for the numerous headloads removed from state lands is impractical. A 1977 study by the MPFD (described in more details below), indicates that there is now a deficit of firewood and small timbers for domestic use in 26 of the state's 45 districts. By the end of the century a total of 39 districts are expected to experience similar conditions.

A regional survey of 6 North Indian States provides an additional perspective on energy use in M.P. This 1976 study by the National Council of Applied Economic Research (NCAER) shows that the energy supply-demand situation is dominated by noncommercial supplies and household use. Non-commercial fuels such as firewood, dung, and crop residues, were found to supply 67% of all energy used, while commercial fuels, including kerosene, gas, and coal supplied only 7 percent. The remaining energy was supplied by animals and human labor. Households were found to use approximately 65% of this energy, agriculture accounted for 26% and industrial (non-farm) use was 6%. The remaining 3% was used in transport and construction. It is reasonable to ask what the potential importance of the project will be from the perspective of overall state energy needs. The carrying out of a comprehensive overview of state energy needs and alternative sources has not been possible. However, some aspects of the problem are apparent. The economics governing increased substitution of kerosene, solar power, electricity or biogas for firewood do not look favorable in the short run. Despite efforts to refine these

technologies, their costs are currently beyond the means of most villagers. Even if the economics were favorable, it would take a substantial time to implement these options. Given the current price of petroleum and the probability of additional increases in cost, it is reasonable to assume for the near future that petroleum products will not be willingly substituted for firewood to meet home energy needs and a high demand for firewood will continue. Similarly the rural population will continue to rely heavily on animals for agriculture and transportation and household energy (dung). Thus the demand for fodder can also be expected to increase.

A 1978 study by the NCAER gives a more detailed picture of household consumption of noncommercial fuels. These data are tabulated in Annex 4 and summarized in table 1 below.

Table 1 - Annual Consumption Noncommercial Fuels in MP(1978)

Type of Fuel	R U R A L U S E				
	House hold (kg)	CR1/ (kg)	Per Capita (kg)	% Non-comm. Household Energy	Equivalent Wt.of firewood per household (kg)
Firewood	950	665	171	59	950
Dungcakes	1052	315	190	28	450
Crop Residues	253	154	46	13	220
	-	1134	-	100	1620

Type of Fuel	U R B A N U S E				
	House hold (kg)	CR (kg)	Per Capita (kg)	% Non-comm. Household Energy	Equivalent Wt.of firewood per household (kg)
Firewood	902	631	148	98	902
Dungcakes	1034	10	196	2	14
Crop Residues	0	0	0	0	0
	-	641	-	100	916

These data contrast urban and rural use. The lower consumption rate for noncommercial fuels in the urban areas is due to the use of commercial fuels. Note in the rural areas, that by weight, more dung cake than firewood is consumed. However, when the weights of firewood and dungcake used are converted to common units (i.e.kgs.of coal which

1/ CR is coal replacement value. Considering differences in energy content and burning efficiencies 665 kg of coal would be required to replace energy supplied by 950 kg of firewood.

would supply similar amounts of heat), the coal replacement weight for firewood is more than twice that for dung. Thus, while more dung is consumed (by weight), the greater amount of energy comes from firewood.

Given the strong dependence of the rural population on non-commercial fuels particularly firewood, and the high probability that this demand will continue, the central questions are: (1) what is required to make supplies more nearly equal to demand and (2) what contribution will the project make to resolving the difference. The M.P. Forestry Department addressed the first question in 1977 in terms of firewood and timber production. Demand for firewood was calculated for each of the states 45 districts using the per capita consumption figure of 0.2 m^3 ^[1] and the district population projected to the year 2000. A similar estimate was obtained for timbers and poles needed for domestic consumption. Supply estimates were obtained, by district, by estimating the average growing stock on both forest and non-forest (agricultural and urban) land and a mean annual increment (volume of tree growth) for each. From these district estimates of potential supply and demand in the year 2000, an estimate of the deficit to be expected in 2000 was obtained. These data indicated that 39 districts in M.P. had or would have firewood deficits by the year 2000. In 16 districts the forests would be completely utilized before the end of the century, assuming no reforestation. The projected deficit for the 39 districts totalled 8 million m^3 (5.33 million mt.) per annum. The total area required in plantations to meet this production would be 1.96 million ha. To meet this target by 2000 starting in 1981 would require planting approximately 98,000 ha annually. (This is equivalent to annually planting an area 19 miles long by 19 miles wide). It would require a yearly investment of about Rs.196 million or \$24.5 million at current prices. It is important to emphasize that the per capita consumption figure used in the projection (0.2 m^3 or 160 kg) reflects only firewood use and does not include substitution of firewood for dung or crop residues. Hence, to reduce the use of dung as fuel the targets would need to be increased. About 20 percent of the area required in the above targets is for production of timber and poles used primarily for local household construction and farm implements.

Under the MP Social Forestry Project 63,450 ha will be planted by 1987. Planting will be implemented in 29 districts of the state having existing or potential deficits of firewood and small timber.

[1] Note that the per capita firewood consumption of 171 kgm given in Table 1, (using a conversion factor of 0.8 tons/m^3) converts to 0.21 m^3 or 0.2 m^3 .

When this area is in full production it will produce conservatively: 86,000 mt. (108,000 m³) of small timber and firewood as well as 150,000 mt each of green fodder and grass annually. This would supply approximately 5000 villages with 25 percent of their annual firewood needs and 15 percent of their total non-commercial energy needs. In addition, sufficient fodder would be produced to feed approximately 120 cattle per village (2 per family) for 2 months of the year. Other products, e.g., fruit and medicinal herbs, would also be produced in significant quantities.

The planting program has been scheduled to increase rapidly over the project period as staff are trained and facilities and extension programs are established (see Annex 3). In the final year of the project more than 20,000 ha will be planted. With the additional 33,000 ha the Forestry Department annually plants in other socially-oriented forestry programs, the overall planting program will expand from about 35,000 ha during the first year of the project to 55,000 ha during the final year. Additional planting will occur on private land as a result of seedling supplied to farmers under the project. By 1987 the annual rate of plantation establishment by the Forestry Department for social forestry will be about 56 percent of that needed to reach the projected target of 98,000 ha per year. The intent of the social forestry project is to involve villagers through local government in self-help programs utilizing community lands as well as government lands. By 1987 it is projected that community contributions of land and local labor will permit an additional 10,000 ha per year to be planted. This would increase the annual rate of plantation establishment to 65,000 ha per year or 66 percent of 98,000 ha target.

Hence the impact of the plantations established during the project period will be significant in meeting the program goals. It is hoped that the institution building and phased expansion of the extension program will lead to even greater production increases after project completion.

Careful consideration was given to attempting to moderate per capita demand for firewood through the introduction of more efficient stoves under the project. Improved stoves are being introduced under World Bank - financed social forestry projects in the states of Gujarat and Uttar Pradesh. In both these states there had been substantial ongoing efforts to introduce improved stoves through research and extension programs. Similar programs have not been attempted in Madhya Pradesh. In order to avoid imposing an excessive workload on the extension staff of the Social Forestry Directorate in its early years an improved stove extension component has not been included under the project. Given all the importance of increased

energy efficiency and reduced per capita firewood demands, however, the Planning and Research Unit of the Directorate will undertake a feasibility study to determine the potential for the adoption of improved stoves by rural households in M.P.

A final factor influencing energy supply and demand is the inter and intra-state shipment of firewood. The GOMP stopped inter-state shipment of fuelwood in 1980 as a matter of policy. Intra-state shipment and sale of firewood, bamboo and small timbers at subsidized prices has been continued. The purposes of this latter program are two-fold: (1) to reduce scarcities of forest products in deficit areas of the state and maintain prices within reach of the poor, and (2) to minimize the impact of uncontrolled harvest on government lands both in economic and ecological terms. The volume of wood involved in government supported intra-state transfer is small, amounting to only 4% of statewide consumption. Therefore, while intra-state shipments may reduce local shortages and moderate prices, their overall impact on supply and demand is small. With potential demand for firewood increasing rapidly, these transfers are likely to be even less significant in the future.

D. Social Forestry

While various forestry programs with social or community oriented goals were begun in the 1950s they gained only limited momentum. In 1973, the National Commission on Agriculture (NCA) in its Interim Report analyzed factors responsible for the failure of these programs "to carry the message of trees to the masses". These were:

1. absence of people's interest and involvement
2. low rates of subsidy
3. lack of a well defined and suitably equipped agency to implement the programs
4. injudicious selection of areas and species for plantation establishment
5. disregard for the views and the convenience of nearby villagers
6. absence of quick results.

The report of the Interim Committee emphasized the need for an extension approach to social forestry stating:

"Social forestry is essentially a program for the people and requires their active participation. Success of the program therefore, lies in evolving a suitable mechanism which would

secure public involvement. The recommendations of the Estimates Committee of Parliament, the Planning Commission, etc. have unequivocally recommended the extension approach of the implementation of social forestry".

The findings of the Interim Committee were well received and included in the final NCA Report of 1976 noted in Section II A above. The report added emphasis to the growing concern for forestry programs to meet community needs (as opposed to commercial needs) and set the stage for more widespread support for social forestry on both state and central governments.

Currently, social forestry programs exist or are being established in all of the major Indian states. The term social forestry is being applied to programs encompassing farm forestry, extension, recreational forestry and community forestry as defined by the FAO. And, in some cases, soil and water conservation as a part of waste land reforestation efforts are also included.

The social forestry program in Madhya Pradesh was established in 1976. In 1978, with support from the Ford Foundation, a Social Forestry Project was established in Bhopal, the state capital. This project, staffed by Indian Forest Service (IFS) personnel posted with the Madhya Pradesh Department of Forestry has fostered a small but effective pilot program. During the years 1976-79 more than 10,000 ha were planted annually in panchvan and degraded forest areas. In 1980 the reforestation program was nearly doubled in size. During this period the studies necessary for development of an extension organization and the initiation of a much larger operational program were undertaken. The Social Forestry Proposal prepared by the MPFD for USAID is one of the results of those activities.

E. Project Strategy and Logical Framework Narrative

Deforestation of village common lands and adjoining government lands near rural villages has resulted in shortages of fuelwood, fodder and other forest products. The underlying cause is the absence of an effective management system. Village lands held in common and government lands used by custom do not provide the opportunity for an individual to put such lands into production with any assurance of receiving the fruits of his labor. This is the so-called "tragedy of the commons". As nearby lands are depleted, production is reduced and the people are forced to go greater distances to obtain wood and find adequate forage for their

animals. This sequence repeated in numerous villages has led to the wide-scale depletion of forest resources described previously.

Given past expenditure levels in forestry and that allocated for the current 5-year plan, it is unlikely that the problem can be handled directly by the Forestry Department. Neither the capital nor the manpower necessary is likely to be available for the department to do the job through large scale, internally administered, reforestation programs. The alternative is to develop a forestry extension program where the Department's expertise in reforestation can be coupled with a village based self-help program. The program's objective would be to instruct and motivate the villagers ultimately to assume responsibility for their own forest plantation or "panchvan" program. If the extension program using local common lands can be expanded to meet needs at the village level, it is reasonable to expect that degradation of lands intended for commercial use, watershed protection, etc. can be reduced.

The logical framework is attached as Annex 5. The project goal is to increase the supply of firewood and forest products on a sustained basis and to increase rural employment and decrease deforestation. The project purpose is the creation of a forestry extension organization which will institutionalize community management of forest plantations on government and village common lands and encourage reforestation on private land through production and distribution of seedlings. The outputs which would support the development of an effectively functioning forestry extension organization include, in addition to trained staff the establishment of nurseries and plantations, the preparation of panchayat extension plans, the development of a technical and social science research capability, and the establishment of a suitable monitoring and evaluation system. Only if the project purpose is achieved will it be possible to realize the goals of the project on a sustained, long-term basis.

F. Relationship to Mission Objectives and Target Groups

The Madhya Pradesh Social Forestry Project falls under the Mission's "energy, environment and forestry" program category. Assistance opportunities under this program category were analyzed in the background paper prepared by USAID for the Asia Bureau's November 1979 Conference on Energy Forestry and Environment, and were given greater programmatic emphasis in the FY 1983 Country Development Strategy Statement (CDSS) for India. The state of Madhya Pradesh lies within the Mission's preferred area of geographic concentration and is characterized by conditions of rural poverty and under-exploited natural resource potential.

The target population will be assisted directly by increased availability of firewood and fodder, timber for housing and agricultural implements and fruit. In the initial years of panchvan establishment, assistance will primarily be in the form of jobs and fodder; by the 5th year, in addition to grass, green fodder, some fruit and firewood will be available. Beginning in the 10th year the full complement of products will be available. Since traditionally women are responsible for planting and nurturing crops, employment opportunities for women, particularly in the forest nurseries and in panchvan establishment, will be enhanced. The project area in western Madhya Pradesh contains a substantial population of scheduled tribals and scheduled castes. The project is scheduled to begin in western M.P. and then will be expanded into the eastern area of the state where the firewood deficit is less acute.

The project will be closely coordinated with other proposed activities under the Energy Environment and Forestry program category, all of which emphasize technology transfer and development of institutional capacity. These include the biomass production component of the FY 1982 Alternative Energy Resources Development Project, which will support expanded forestry research capacity at India's two recently designated biomass centers (one of which is in the neighboring state of Uttar Pradesh), the Agro-Forestry sub-project of the FY 1982 Agricultural Research Project, which addresses the problems of shifting cultivation and use of marginal lands, and the FY 1982 Land and Water Conservation Project, which is similarly aimed at the development of an effective system for local management of common resources supported by extension programs.

PART III

PROJECT ANALYSIS

A. Institutional Development

The main thrust of this project, technological transfer through institutional development, will be accomplished through the establishment of the Social Forestry Directorate and its extension program within the Madhya Pradesh Forestry Department.

1. Madhya Pradesh Forestry Department

The Madhya Pradesh Forestry Department now consists of approximately 36,000 personnel of which 800 are professionally trained, gazetted officers. The Department administers 15.6 million ha of land, approximately 20% of the land classified as forest in India. The organization is headed by a Principal Chief Conservator of Forests who reports to the Minister of Forestry. The state is divided into two semi-independent functional units each under a Chief Conservator of Forests. In each region functional groups for handling activities such as logging, marketing and reforestation are under the direction of a Divisional Forest Officer.

The Forestry Department with an annual budget of about \$47 million supervises programs in watershed and wild-life management, plantation establishment (for both social and commercial uses) and commercial harvesting and marketing. It routinely administers welfare programs aimed at employment generation and food distribution using drought assistance and other monies. It assists tribals through training programs and in the production of minor forest products under tribal subplans. The Department also provides firewood to urban areas and to deficit rural areas of the state through supply depots.

The current social forestry program carried on by the Department involves other activities in addition to the panchvan scheme and road, rail and canal side plantings. It has established grass farms, natural areas, game reserves and urban parks. It is heavily involved in reforestation of critical upland watershed areas needed to protect the State's water resources. The Department has a continuing reforestation program aimed at placing degraded forest "waste" land under its supervision back in production.

The M.P. Forestry Department has been involved for some time in various social forestry and other welfare schemes as

previously described. However, because of the absence of established funding, and the lack of a specific administrative "home" within the Department, these programs have operated on an ad hoc basis. Formation of the Social Forestry Directorate will provide an administrative base and facilitate integration of emergency programs, (e.g. use of drought relief funds), with ongoing social forestry projects.

2. The Social Forestry Directorate

The Social Forestry Directorate will be established formally in October 1981 by order of the Government of Madhya Pradesh. The Directorate will be headed by a Director of Social Forestry with the rank of Chief Conservator of Forests (CCF). The CCF reports to the Conservator-in-Chief of Forests, the senior officer in the Forestry Department. Under the CCF will be two "Additional CCF" (ACCF), one for administration and one for planning, training and research. An organizational chart is shown in Annex 6. The ACCF for Administration has basic responsibility for extension and reforestation programs. His staff will be subdivided on a zonal basis and spread over four administrative levels with the largest number of staff serving at the block and panchayat levels. The evaluation and monitoring unit has also been placed under the ACCF Administration and at the zonal Directors level to facilitate cooperation between operational and monitoring staff. The second ACCF is responsible for Planning Research and Training. If the planning and research functions are to be timely and fruitful, the evaluation and monitoring staff must be responsive and effective in supplying information to the planning and research staff. Close cooperation between the two ACCF's is needed to make the program effective. The special research and planning committee nominated by the Director provides a vehicle for the required coordination and cooperation. The Public Affairs office under the Director will provide liaison at the legislative level and between the State level administrators and the advisory committee structure. Public affairs officers will be posted in each zone.

An important part of the organization is the advisory committee structure which helps ensure effective participation and cooperation between government departments, institutions and local bodies. These committees, which will operate at various administrative levels, will provide the opportunity for communication between administrative levels and with persons outside of the departments. The committees are expected to coordinate their activities with the appropriate levels within the Direc-

torate but in addition, provide alternative channels to express their concerns to the CCF.

The Interdepartmental Policy Committee will be established by the Government of Madhya Pradesh. It will consist of high level representatives from other Departments with whom the Directorate must coordinate its work e.g. the Revenue, panchayat and Social Welfare and Finance Departments, as well as the Forestry Department. It will advise the Director on matters presented to it by the Directorate, outside departments and subordinate advisory committees. A key function will be to insure expeditious handling of proposals requiring the approval of several Departments. One of the Committee's initial tasks will be to recommend to the Director the membership, function and responsibilities of District Block and Panchayat level advisory committees. These should be examined thoroughly in terms of building effective cooperation and participation between the Social Forestry Directorate, local government and the people. The Interdepartmental Committee will also assume the responsibility of designing a general agreement for use between the Forestry Department and the panchayats (see Part III, E-3 for more details).

The agreement would describe the responsibilities of parties concerned within a set of guidelines which permit sufficient administrative flexibility for the Department to cater to the specific needs of various communities.

3. Extension Program

For the Social Forestry project to reach its full potential an effective extension program and working relationship must be established. The extension program is the vehicle by which the communal system of panchvan production will be institutionalized at the village level. Its purpose will not merely be to convey the details of how to grow seedlings and establish and manage plantations, but will encourage understanding and acceptance of two ideas fundamental to the success of the program and project. First, trees, fodder and other forest products can and must be grown like food crops, if there is to be a continuous supply available at the village level. Secondly, of the Forest Department must be perceived as a partner in the production of forest crops, just as the Agricultural Department supports crop production. Bringing about enlightened acceptance of these ideas is the task of the Social Forestry Extension Program.

To simultaneously build an extension program, train extension personnel and initiate a planting program, a project expansion strategy has been devised. This strategy is based on a time phased program where training, extension work, and planting programs are initiated at 5 geographical centers within the project area. The expansion plan, described in Annex 7, involves project initiation with a small staff and modest program with rapid, but controlled, growth through to the final year of the project.

For administrative purposes the project area will be divided into 6 zones each encompassing 4 to 6 administrative districts. Each district is further divided into approximately 10 development blocks. In the year prior to full scale operation within a given district, a pilot division (staff, facilities, program) will be established in a centrally located block. During the 2nd year (1st year of full scale operation) the pilot program will be expanded to several surrounding blocks through establishment of additional regular divisions. In this manner the program will spread from geographical centers within each district. Similarly, repetition of the program within each of the 6 zones will extend the program to the entire project area. In addition to making project implementation easier, the strategy establishes a mode of operation suitable for program expansion after completion of the project.

Headquarters for the social forestry extension program will be situated near the existing center for other Block programs. Most Blocks have ongoing programs in health, education and agricultural extension, and coordination of the forestry extension effort with them is desirable. Further, the Block organization, headed by a Block Development Officer (BDO), is the focal point for local administration for the majority of government programs. Most importantly, however, the janpad panchayat, which coordinates local government at the block level is located here. The janpad panchayat consists of sarpanch (headmen) elected by the panchayats. The BDO is an ex officio member (secretary) of the janpad panchayat. Sarpanch generally are literate, knowledgeable about problems beyond the village and have been often elected because of the confidence villagers have in their fairness and judgement. It is to the janpad panchayat that the virtues of social forestry must be sold and with the block organization that the program must be coordinated. The sarpanch, once supportive of the program, can provide access to the panchayat and hence to the villages. The BDO and other extension personnel from other departments can provide assistance in the establishment of the Social Forestry program through cooperative endeavors. Full cooperation with

other extension programs is intended however, full integration of staff at the block level is not. While the extension staff build up under the Directorate is appreciable (1,800), there are 47,000 villages in project area. Assuming only 10% of these villages participate in the program, the staff level would be about 1 person per 3 villages. Greater interest in anticipated in the program hence the field staff may be spread even more thinly. Any further dilution of effort, in terms of forestry extension workers fulfilling needs of other extension programs, would be to the detriment of the social forestry program.

The Block level extension programs will be implemented by 6 extension officers, 13 assistant extension officers and about 40 extension workers. Extension program work plans for all social forestry activities within the block will be developed. These plans which are to be developed in consultation with the janpad panchayat, will detail implementation of the social forestry program and its coordination with other development efforts. Specifically, the plan will (1) identify strategies for resolving, economic cultural, political and technical problems which must be addressed in the formulation panchayat level management plans and (2) establish priorities, budgets, staffing and scheduling for overall program implementation.

The role and responsibilities of the Social Forestry Directorate, its extension staff at the local level and the panchayats will be described and defined in the following two documents: the panchayat level Management Plan and the Forestry Department - Panchayat Agreement. The management plans will be developed by the extension staff in collaboration with village panchayats. They will require a survey of current land use, a determination of site capability, and include a recommendation for development of plantations taking into account the needs and preferences of the villagers. Information about the panchayat, the local people and the existing socio-economic situation will also be included. After the technical information is compiled and before the plan is finalized, the proposed plan and alternatives will be reviewed by the panchayat. When the management plan is finalized, it will contain the mutually agreed upon technical and administrative details of panchvan establishment and maintenance and include the concerns elaborated upon in Part III Section 4.3). The Forestry Department - Panchayat Agreement is the legal document by which the management plan is implemented. Since the Agreement and its guidelines are to be drafted after project initiation, they will not be available during the first 2 years of project implementation. During this

interim period, the management plan between the Forestry Department and the panchayat will serve the purposes of the Agreement for pilot Divisions 1 through 4. As specified in Part IV D-3 the GOMP will covenant that the Forestry Department - Panchayat Agreement and Guidelines will be developed for review by October 1982. This will be the basis upon which the project will finance the remaining four years of the program.

4. Research and Training

a. Research

The need for a research program to support Social Forestry Directorate activities is well recognized. A Research Unit of 22 staff members is proposed. Personnel hired to fill research positions will be funded at local university wage schedules to secure and retain competent scientists in the program. The initial research program will be established in Jabalpur as a unit of the State Forest Research Institute (SFRI). The MP SFRI was established in 1963 and is currently engaged in research related to social forestry, e.g. silviculture, genetics, forest soils, pathology, entomology and forest management. This arrangement will permit the new research staff to have immediate access to laboratory and office space and facilitate the coordination and overall strengthening of social forestry research. It is the intent of the Department, however, that the research unit maintain its separate identity, and concentrate its efforts on problems of immediate concern to the Directorate at least throughout the duration of this project.

At present the research program is in its formative stages. The first priority of the research unit will be to design the zonewise species trials proposed under this project. Other priority research areas include:

- (1) Seed storage methods including effect of storage on viability.
- (2) Impact of increased firewood production and subsidies on the demand for commercial and other non-commercial fuels in M.P.
- (3) Potential for reducing firewood demand through the introduction of more efficient cooking stoves.
- (4) Current use of forests by villagers and expectations of villagers under social forestry program.
- (5) Attitudes of villagers towards the Forestry Department and potential impact on extension program.

(6) Economics of intensive silvicultural systems in panchvan context.

(7) Evaluation of alternative methods for distribution of panchvan produce, and the impact of cost recovery schemes.

(8) Socio-economic factors influencing the contribution of village lands to panchvan use.

When the research unit is operational a complete review of ongoing research and research needs will be made. The Forestry Department has given assurances that the research organization would be operationally staffed and a research program judged satisfactory AID prepared, by May 1982. This will include information describing the proposed remodeling at the State Forest Research Institute.

b. Training

Few of the current Forest Department staff have formal training in extension methods. Most of the new staff for the Directorate extension program will need additional training in extension methods, rural sociology and forestry. The need to develop a philosophy of service in the Directorate staff is well understood by senior Department staff. This understanding and philosophy needs to be emphasized and diffused throughout the current staff as well as the new staff via inservice training.

To meet these needs the following four types of training are proposed:

(1) Fellowships and study tours for senior and mid-level personnel in the U.S. and in third countries where substantive socially oriented forestry programs have been established. Training will include administration of extension programs, social science research methodology, monitoring and evaluation methods, and agro-forestry.

(2) Internships for extension personnel which provide short-term (4-12 months) formal training at Indian Universities or other centers prior to field assignment.

(3) Formal training programs of 3-4 months duration for entry level field personnel.

(4) In service training at all levels.

Topics which will be emphasized in the inservice and entry level training include:

- (a) socio-economic problems of rural Indian communities:
- (b) extension methods and organizations;
 - (c) communication with, and motivation of, rural people;
 - (d) land use opportunities for degraded land;
 - (e) soil and water conservation methods;
 - (f) concept of multi-use forestry including management principles for: firewood, small timber, fodder, silvipasture and other agro-forestry systems;
 - (g) elements of agronomy, fruit tree culture, animal husbandry and dairying; and
 - (h) common methods of raising tree crops.

The Directorate has already begun to develop its training program. One hundred new staff members received training at the Ranger School in Shivpuri in November of 1980. These men will provide the initial core staff for pilot operations to begin in 1981. To continue and enlarge this program, funds are provided for expansion of existing facilities at Shivpuri. A detailed training program, however, has not been prepared. The Directorate will obtain outside assistance in developing its training program and has provided assurance that a training program satisfactory to AID will be developed by June 1982. In addition to describing curricula, training schedules, facilities etc., the training program will describe recruiting procedures and efforts to encourage participation by tribals, scheduled casts, women and children.

B. Reforestation

Reforestation under the social forestry program will take place primarily on government lands administered by the Forest and Revenue Departments. These Departments have about 2.5 million ha of waste or degraded land under their combined jurisdiction. These lands are defacto common land generally used for grazing village cattle. Furthermore, the Public Works Department, the GOI and State Irrigation Departments control road rail and canal side areas estimated at 0.1 million ha which are generally in equally poor condition. Community waste land under control of the panchayats constitutes an additional 50,000 ha. Most of this land is marginally productive for agriculture. Though used for pasture, because of overgrazing and erosion, it produces only limited amounts of fodder. These 2.65 million ha

spread throughout the project area provide the basis for the social forestry reforestation program. The main virtues of these lands are their availability and general proximity to the villages. The specific location of plantations will be determined by which villages elect to participate in the program and the availability of government and community lands in that vicinity.

1. Planting Targets

A reforestation effort totaling 63,450 ha is planned under the project requiring only 2.3% of the available land. Of this amount, about 48,000 ha, 76%, will be planted to mixed species in panchvan or village forests. The balance will be in silvopasture and road, canal and rail side plantings. Planting targets by year are shown in Table 2 below. These targets assume a normal monsoon (monsoons provide only 50% of normal precipitation one year out of four) and that village extension programs nursery production and seedling distribution system are properly coordinated and in place to permit planting in June with the arrival of the monsoon.

Table 2 ANNUAL PLANTING TARGETS (ha)

<u>Y e a r</u>	<u>Zonewide Trials</u>	<u>Pilot Blocks</u>	<u>Regular Division</u>	<u>T o t a l</u>
1981-82	1200	225	0	1,425
1982-83	1500	1425	0	2,925
1983-84	0	2775	4950	7,725
1984-85	0	3525	10050	13,575
1985-86	0	4200	13050	17,250
1986-87	0	4500	16050	20,550
	2700	16650	44100	63,450

2. Local Site Selection

As pointed-out in previous discussion, the overall quality of land available for reforestation near or adjacent to the villages is not high. Still it is both biologically and psychologically desirable to select an average or better site for the first years planting. Careful consideration must be given to the trade-offs between the expressed desires of the villagers, potential site productivity, and other practical considerations, e.g. digging the trench fences. Because lands available for panchvan are scattered around the villages, it is important to look at the

overall availability and quality of community and government land in the context of existing land use. As previously described, selection of panchvan sites will be done in a collaborative effort between villagers and the directorate extension staff based on information and recommendations included in the management plans.

3. Silviculture

The species composition of panchvan will depend in part on the preferences of the villagers. In general about 80% of the trees planted will be firewood species and remainder for other products, e.g. medicinal plants, poles, materials for agricultural implements. A list of preferred species and their uses appears in Annex 3, Table 2. Because of the generally poor quality and aridity of sites, initial plantings will consist largely of local species. Reliable yield information for the poorer sites and arid conditions of Madhya Pradesh are not available for many of the species of interest. Most of the species trials established in Madhya Pradesh are too recent to be conclusive. Particularly with reference to two highly publicized, fast growth species, Mysore or Red Gum, Eucalyptus teriticornis, and Koo-babul, Leucaena species there is little evidence in Madhya Pradesh to show that on harsh sites, the early rapid growth characteristic of these species, will be sustained. There is more evidence that indigenous species such as Aonla, Embllica officinalis, neem, Azadirachta indica, Siris, Albizzia lebbeck, and Sissoo, Dalbergia, sissou can be productive on these sites. Hence, varieties of Leucaena and other exotics will be used in moderation until their productivity under local conditions is more clearly established.

Spacing in plantations will vary from 1.5 to 4 meters according to site conditions and village preferences for forage and grass. It is anticipated that the closer spacing will be used on better sites. This would permit more intensive green fodder production until crown competition was significant and thinning was necessary. Any enhancement of early production from panchvan will increase their utility and acceptance by villagers. Weeding and watering of seedlings will be done as needed, normally twice in the second year and once in the third year. Seedling survival rates are expected to range between 75% and 80%. Casualties will be replaced in the second year. Planting costs for a typical mixed species plantation and silvipasture are shown in Annexes 8 and 9 respectively.

As will be discussed in more detail later, an important avenue for technology transfer will be research programs. These

programs will supply information on productivity under local conditions and include spacing trials, provenance tests, and determinations of water requirements.

4. Protection

The major concern for panchvan protection is the illegal harvesting of produce by men and cattle. A trench fence approximately 1.5 meters wide and 1.0 meter deep will be hand dug by local labor around each panchvan. Acacia sp. and Prosopis juliflora will be planted inside the trench to further discourage cattle. A chowkidar (watchman) will be hired to protect against human interference, to maintain the trench and for fire protection.

To prevent termite damage, dieldrin will be dusted into the bottoms of the planting holes. Dieldrin is registered by the US Environmental Protection Agency for use in this manner. Burial of the material 30 cm below the surface minimizes subsequent human exposure.

5. Nursery Production

Nursery production will be decentralized and carried out almost entirely by manual labor. The use of manual labor will increase rural employment, a project goal. The decentralized production of seedlings is required because of the difficulty of transporting seedlings over an unpaved highway system during the monsoon season. Many villages are not served by a road and seedlings can not be transported in advance for lack of storage facilities at the village. Establishment of about 135 small nurseries through out the project area is therefore necessary.

Forestry Department seedling production will be augmented by 1200 school nurseries and a number of small private nurseries where applicable. School nurseries have been found useful in other projects both for their public relations value and as supplemental production. The small-scale private production offers an opportunity for the less fortunate, e.g. indigent women, and institutionalized persons to contribute to their own support.

Nursery facilities will not be elaborate. Nominal shelter for staff and equipment will be provided along with some sunscreen protection for plants. Planting pits will be used for both poly-pot and open grown seedlings. A small trench irrigation system will be developed but the major investment will be the engine and

and pump for water supply. Operating costs will be chiefly staff salaries, and petrol for the pump engine and vehicles. Seedling production costs are summarized in Annex 10.

6. Seed Production and Storage

Reliable supplies of good quality, genetically-superior, seed are desirable for efficient reforestation and to increase panchvan yields. In natural forests the frequency of good seed crops varies by species and is strongly influenced by climate. The quantity of seed production per tree also differs significantly between species. Equally important are genetic variations between varieties of the same species which influence their rate of growth, quantity of leaf production or ability to withstand drought. Hence the quantities and quality of seed produced in natural forest stands of mixed species varies significantly from year to year and between stands. To assure the availability of quality seed from selected species in sufficient quantities for large reforestation programs, it is common practice to collect, process (cleaning, testing the percent of viable seed, drying to prevent rot etc.) and store seed so that sufficient quantities of seed are available as needed.

In Madhya Pradesh seed processing and storage facilities are in short supply. It is common practice to base the current year's reforestation program on the last years seed crop. Seed collected and planted in nurseries during the previous year provide the seedlings for out-planting reducing storage costs and losses in seed viability frequently associated with longer storage. Where seed is collected from seed orchards, genetically superior seed can be obtained. However, in practice seed from orchards is not always available, and seeds collected from natural stands or plantations by unskilled laborers are frequently of inferior quality, particularly during periods of seed scarcity and drought. While these difficulties are appreciated by the Forest Department, they have not been completely resolved and the problem will become more acute with the expansion of the social forestry program. The probability of success in panchvan establishment and hence in the project, will be significantly improved with better seed supplies. The technology for improvement is well known hence a major effort under the project will be made enhance seed production and storage.

The Directorate staff in collaboration with consultants will address this problem in two steps. First, an evaluation will be made of current methods, facilities and staff in terms of the projected program needs. It is anticipated that with the construction of seed storage and processing facilities and a

modest training effort, significant improvements in seed quality and supply can be achieved within one to two years. A second step will be to define gaps in existing knowledge and to design a research program to meet these needs. It is anticipated that much of this research will be done by the Directorate staff in collaboration with already existing research programs.

C. Construction

1. General Design and Specifications

The proposed construction represents a continuation of the M.P. Forestry Ministry's efforts to provide an infrastructure for its staff near project sites. Standard plans for most of the buildings have been developed, and materials specifications are designed to take advantage of locally available materials and labor. Site selection criteria are consistent with the structures' generally simple and uniform design. Sites will be free of flooding, have natural drainage, and be easily accessible. Sites for major buildings will have electricity and a potable water supply. Approximately 1900 buildings will be constructed.

2. Construction Management

Building and construction procedures will follow the standard practices of the Forestry Department. Since the buildings to be constructed are generally simple in design and structure, the Forestry Department carries out supervision of activities, as there is little engineering skill required. Building materials are purchased locally utilizing a competitive bidding process. Labor is hired by the Forestry Department which on occasion completes work on a force account basis.

The Forestry Department is responsible for preparing cost estimates for financing and annual work plans for construction. Cost estimates include an inflation factor of 30% over the life of the project. This figure is considered reasonable due to the small size and type of structures contemplated and the availability of locally made materials. The construction plans are technically, financially, and administratively sound. On the basis of the above analysis, the requirements of Foreign Assistance Act 611 (a) have been met. For a more detailed analysis and cost estimates, see Annex 11.

D. Economic Viability and Impact

1. Benefit - Cost Analysis

The economic feasibility of the project has been examined from two perspectives: the village and the Madhya Pradesh government. In the village-level analysis, discounted benefits and costs are compared to determine trade-offs in plantation size, species composition and site conditions. In the overall analysis, benefits and costs are aggregated to determine the project's contribution to the state's economy. This section summarizes the results of the analysis. For details see Annex 2.

The village-level analysis uses panchvan models synthesized for ecological conditions in both eastern and western Madhya Pradesh, reflecting the more arid conditions in the west and the less harsh sites in the east. Each model contains a mixture of species and products, i.e., firewood, fodder, timber and poles, and fruit. The models were evaluated for a 30 year period on a sustained yield basis using current market values for the various products. The lowest internal rate of return (IRR) was 13% obtained with the "firewood" model. The highest IRR was 24% obtained with one of the four "mixed product" models. All mixed product models had IRRs in excess of 19% (see Annex 2, Table 4). Assuming 12% as an acceptable minimum rate of return for India, all models are economically viable. The greater IRRs of the mixed product plantations reflect the fact that despite its scarcity, the market value of firewood is relatively low. As firewood becomes increasingly scarce, however, its market value will increase relative to the market value of the other products included in the mixed plantations, since villages will find it very difficult to reduce firewood consumption given available foods and food habits. With the relative market value of firewood increasing villagers will tend to choose species mixes providing greater firewood production.

The panchvan models may be combined and aggregated to provide the basis for the benefit-cost analysis from the perspective of the Madhya Pradesh government and the state's economy. This is necessarily arbitrary, since both the panchvan models themselves and any projections concerning their relative importance over time require a large number of assumptions. An aggregated analysis based on one possible set of assumptions is presented in Annex 2, Table 16. The internal rate of return is simply the weighed average for the four mixed-product panchvan models, and works out to 22% in this case. This is an attractive investment from the perspective of the state.

The aggregated benefit-cost analysis, like the individual panchvan models, includes only establishment costs (seeding, planting and fencing) and recurring costs (protection and maintenance); it does not include overhead expenses of the Government of Madhya Pradesh. The overhead costs in the initial five years of the project are roughly equal to the costs of establishing and maintaining the projected plantation area, but these costs will decline sharply relative to plantation costs as the social forestry program matures. In any case with an IRR as high as 22%, substantial cost increases can be absorbed before the rate of return declines to the minimum acceptable level of 12%. Also, no attempt has been made in the benefit-cost analysis to assign "shadow prices" to various inputs and outputs based on their scarcity value. The effect of shadow pricing in the Indian context is generally to reduce costs associated with unskilled labor and to increase the benefits associated with most outputs. Furthermore, the benefits quantified in the analysis understate the true benefits of the project, since they do not include ecological benefits, time savings in fuel collection, or increased agricultural production deriving from the use of dung as fertilizer rather than fuel.

2. Distribution of Benefits

One of the attractive attributes of social forestry projects is the direct accrual of benefits at the local level. Both production and consumption will occur primarily in rural areas with the target population receiving benefits from both. The most immediate beneficiaries of the program will be local village labor hired to construct nurseries, housing and subsequently to staff the nurseries and establish the panchvan. Over the life of the project an estimated 30 million person days will be required. With respect to the distribution of produce the method of distribution will be determined at the time the panchayat enters into an agreement with the MPFD for the establishment of the panchvan (see Section E-3 below). A number of options are open to the panchayat. Produce can be sold to the villagers; it can be granted to them by permit according to need; or they can receive produce from a portion of the plantation they have tended. The panchayat also could elect to sell the more valuable fruit and timber to defray maintenance costs and distribute the firewood, etc., by another scheme.

While the Forest Department - Panchayat Agreement will be important in assuring an equitable distribution of project benefits, an even more important factor will be the close functional link between plantation viability and incidence of

benefits. Unless all groups in the village perceive some net benefit accruing from the village plantation, they will not cooperate in maintaining and protecting it. The panchvan guard and the cattle trenching can only protect the village plantation if there is general cooperation. Consequently, panchayats will have a strong incentive to arrange for a broad distribution of the benefits, otherwise the viability of the plantations may not be assured.

Regarding the distribution of project financial benefits between the panchayats and the MPFD, the GOMP has decided not to employ a cost recovery scheme. At one time the MPFD had considered requiring that panchayats turn over 50% of panchvan proceeds after deduction of harvesting costs. As Annex 2 shows, this could easily make panchvans relatively unattractive from the panchayat's perspective and would considerably reduce the incentive for villages to participate in the program. The MPFD has given assurance that it will not employ a cost recovery scheme during the project.

While the absence of a cost recovery scheme increases the apparent financial cost of the program to the GOMP, there are important offsetting financial benefits.

The MPFD estimates that 68% of the wood cut from forest land is used as firewood. Of this 68% they estimate that two-thirds could be used for products having a higher market value than firewood. If, as a result of social forestry programs, less firewood is taken from government lands, more wood volume could be marketed as other products, e.g. timber. This could substantially increase government revenues, as prices for timber can be 5-6 times those for firewood.

E. Social Soundness

the ultimate success of this project will depend not on the number of trees planted, but, on the acceptance and effectiveness of the Social Forestry Directorate and its extension program. Without local support, it is unrealistic to expect that the Directorate can either mount or sustain a socially oriented reforestation program sufficient to the need. Given the traditional role of women in the collection and use of firewood, it is paramount that the Directorate motivate and enlist the support of both sexes as workers and managers. In the following analysis three basic questions are addressed. Is the project culturally and socially feasible? What is the role of the Forestry Department - Panchayat Agreement? What will be the role of women and children?

1. Socio-Cultural Feasibility

Social practices and cultural beliefs should not be a major problem in the development of Social Forestry programs. Societal concerns on religious and other grounds regarding forests and cattle in particular, and natural resources in general, are either supportive of the project goals or can be accommodated within the proposed project framework.

Moreover, there has been a general awakening among rural people in recent years with respect to forests. This is particularly true among women who have been adversely affected by deforestation. One expression of this awakening is the "Chipko" movement in which women and children have thwarted forest exploitation by literally placing their bodies between axe and tree. This movement which started in the hill region of Uttar Pradesh has been successful in stimulating public concern and has received wide publicity. The GOI has expressed its support and appreciation by decorating the leader of the movement. Inspired by this popular movement panchayats and Mahila Mandals (rural womens clubs) have become interested in forest preservation. These public expressions of concern suggest the direction of public opinion regarding commercial forest exploitation, and imply support for the type of reforestation activities proposed in this project. For an extended discussion of these questions, see the detailed Social Analysis prepared by the design team (on file with ASIA/TR).

2. Extension Program Feasibility

Since the 1920's there have been programs, public and private, designed to enhance soil and water conservation or to plant trees or preserve wildlife. These programs have met with varying degrees of acceptance and success. In practice they did not displace the general population's expectation that forest produce would be available as a matter of right. This is understandable. The taking of forest produce or usufruct, referred to as "nistar" rights, was a long standing right of villagers from ancient times through the colonial period. With the formation of an independent India in 1947, these rights came to be viewed more as grants than as rights. Protection and regulation of reserved forest lands is the responsibility of the Forest Department as the government's agent. Despite efforts to avert the problem, the role of a production-oriented and uniformed Forestry Department in policing forest lands has often led to enmity between the Department and villagers. Coupled with a general reluctance to become involved in government programs, this enmity constitutes a signi-

ficant problem to be overcome in the development of an extension program. Perhaps the most positive aspect of this problem is the attitude of the Madhya Pradesh Forestry Department. It has fully acknowledged the problem and its significance. The Department currently has a public relations program to explain its programs and function. The Social Forestry Directorate will have public affairs officers in each district to enhance communication. Finally, and most importantly, the Department is irrevocably committed to development of a service philosophy among the new Social Forestry Directorate staff. Selection of staff for the Directorate will be made with this need in mind, and in-service training will emphasize the service orientation of the program.

3. Forestry Department-Panchayat Agreement

A written agreement between the panchayat and the Social Forestry Directorate will function as a key communication linkage in the extension program. The purpose of the agreement will be to establish an equitable relationship clarifying responsibilities and benefits of both parties in the establishment and subsequent management of the panchvan as described in the management plan (see Part III, Section A.3). It is intended that the tenor of the agreement serve primarily to enhance amicable working relationships. The agreement however will be legally enforceable and describe what recourse is open to either party in case of default or disagreement.

Flexibility in provisions of the agreement are necessary to meet the preferences of the panchayat and the varying administrative and fiscal situations under which panchvan will be established. Rather than have a single general agreement, it may be preferable to have a set of guidelines. These would specify and govern provisions in all agreements but offer some latitude in administrative arrangements, e.g. how and when produce will be harvested or the quantity of land to be contributed by the panchayat. The agreement (and the management plan) would address other concerns such as:

- (1) The quantity and location of community and government land to be used in the panchvan.
- (2) Type of species to be planted.
- (3) Responsibility for establishment, maintenance, and protection of the plantations.
- (4) Training to be provided by Forestry Directorate for villagers.
- (5) Records to be kept by both parties.

- (6) Conditions for panchvan expansion.
- (7) Manner in which management decisions will be made.

Finally, it should be emphasized that the agreement will play an important role in convincing villagers that the panchvan program is for their benefit. Since Directorate extension personnel will play a substantial initial role in planning for the panchvan, it is important for the project to be seen as a self-help effort. Villagers must be encouraged to view the panchvan as a village project with government support rather than a government project from which the village receives benefits. Three provisions to be contained in the agreement are paramount in this regard. These provisions would:

- (1) provide reimbursement to the panchayat for funds spent in panchvan establishment and protection;
- (2) define the method of distributing produce from the panchvan; and
- (3) specify the steps which the panchayat and village must accomplish before full control of the panchvan is vested in the panchayat.

As noted in Section IV-F below, the GOMP will covenant that the agreements and guidelines will be developed for USAID review by October 1982.

4. Role of Women and Children

A large number of women will be involved in this project through their traditional roles as collectors and principal household users of wood. Women are also very much involved in the collection of fodder for animals. Cutting of grass and green fodder in the panchvan should provide additional employment. Also most Forest Department nurseries now employ women to prepare seed beds, and tend and lift seedlings for transplanting. Women are also employed frequently in planting operations, including the hard manual labor involved in digging pits, hauling water, and digging trench fences. These employment opportunities will be increased by the project. With experience and training gained through the program, some women will also move from day-laborer positions into supervisory roles in nursery and planting operations.

There are also roles for women with professional and sub-professional skills. There are no legal bars to employment of women in such positions now. Their absence at present reflects traditional and continuing cultural biases, and the lack of trained

applicants. In 1981, the first three women will be graduated from the National Forest College at Dehra Dun, and enter the ranks of the Indian Forest Service. One of these women is from Madhya Pradesh and may be posted to the Social Forestry Directorate.

Women can also serve as extension officers and as extension workers (van sewikas). Extension officers will be drawn from the pool of graduates of university agricultural, science and forestry programs, and will provide the backbone of expertise needed in the outreach programs. Extension workers will have a high school education or equivalent experience and provide the major day-to-day contact with villagers. Women from rural areas where panchvan programs will be established would be particularly useful in the capacities described above, and education requirements will be modified to insure their participation of necessary. The M.P. Forestry Department has assured AID/India that qualified women will be actively recruited for these positions.

The M.P. Forestry Department is keenly aware of the need to include children in the social forestry program. The Department's current radio program is designed to appeal to both adults and children. With the formation of the Directorate, a more comprehensive effort will be made to communicate with children. Active participation of school age children will be encouraged through the establishment of seedling production program as a part of school activities. The Forestry Department will supply the necessary materials and technical skill free of charge to approximately 1200 schools. Seedlings grown by the children will be purchased by the Department for distribution to farmers. The children's experience in growing seedlings will enhance individual awareness of social forestry problems and reinforce the concepts of self-help through community participation.

F. Financial Analysis and Plan

1. Project Costs

Project Cost Estimates are based primarily on estimates and projections prepared by the M.P. Forestry Department for a six-year period covering the life of the project. These figures as contained in the project proposal submitted to AID were reviewed by the project design team and found to be reasonable. The proposal has been incorporated in the M.P. five-year (1981-1986) plan and will form the basis of annual budget allocations to the project. The summary cost estimates below are a result of final discussions between USAID and M.P. forestry officials. They differ slightly from the those in the M.P. proposal and revisions made by the team. As Table 3 below indicates, total project costs at \$50

million will be shared by AID and the M.P. Government on an equal basis except for costs related to the grant component of \$1 million.

Project costs incurred after April 1981 primarily in connection with the start-up of plantations during the monsoon season (June-July 1981) would be eligible for AID financing after the agreement has been signed.

2. Loan Financing

The loan portion of \$24 million will finance local costs related to establishing and maintaining plantations and nurseries. These make up about 50% of total project costs. The remainder are related to staff salaries, general operations, construction, and equipment. AID financing will not be used for vehicles nor costs incurred in the expansion and remodeling of the existing research and training facilities.

3. Grant Financing

For this portion of the project, AID will finance 100% of the costs of obtaining the services of short-term U.S. consultants and Indian organizations for assisting in the design and implementation of research and with the design of a training curriculum. These costs will account for about half the grant while the remainder will be used for training both in-country and abroad. As estimated \$400,000 (40% of grant funds) will finance direct foreign exchange costs for participant training abroad and for U.S. consultancy services.

Table 3 Summary Cost Estimates and Financial Plan (\$1000)^{1/}
(More detailed estimates are found in Annex 12)

<u>I t e m</u>	<u>A I D</u>	<u>G O I</u>	<u>Total Cost</u>
Staff	4,934	4,934	9,868
Operations	2,401	2,401	4,802
Nurseries	3,105	3,105	6,210
Plantations	9,314	9,314	18,628
Equipment ^{2/}	1,592	1,592	3,184
Buildings ^{2/}	2,654	3,654	6,308
Training ^{3/}	520	-	520
Consultancies	480	-	480
<u>T o t a l</u>	<u>25,000</u>	<u>25,000</u>	<u>50,000</u>

^{1/} Rate of Exchange: \$1.00 = Rs.8.0

^{2/} Includes \$600,000 for remodeling of training and research facilities, not eligible for AID financing.

^{3/} AID Grant component.

Note: Estimates include inflation factor of 16% for the first five items and 30% for buildings.

G. Environmental Analysis

As a result of the Initial Environmental Examination a negative determination was recommended by USAID and subsequently approved by AA/Asia. See Annex 13. As can readily be seen from the description above of the various project facets, the project activities are designed to identify and correct existing environmental degradation and contribute to the long run improvement and rationalization of land use for the areas involved.^{1/}

The project will support construction of offices and housing to accommodate the increased members of staff needed for expansion of the Social Forestry Directorate. The structures vary in size but are generally small and of a similar basic design. Good natural drainage and the avoidance of flood prone areas are criteria used in selecting sites. Local materials, except for small amounts of cement for surface plastering, will be used. USAID's inspection of buildings similar to the type to be constructed, site locations, and construction practices indicate that this component of the project is consistent with the conclusions reached in the IEF.

^{1/} Note that over the course of project development the project as now conceived has institutional building as its primary purpose. While this differs with the purpose as stated in the Project Description of the IEE (Annex 13), because project activities remain unchanged, the conclusions of the IEE are still valid.

Part IV

IMPLEMENTATION

A. Implementation Schedule

The basic project elements are (1) establishment of the Social Forestry Directorate and (2) execution of the organization's extension program. The project will commence in FY 81 and continue for six years. Initial emphasis in (FY 81 and 82) will be placed on establishment of the Social Forestry Directorate. However, research trials and Pilot extension operations will begin as specified in Annex 7. To insure adequate time for staff recruitment, training and program development during the first two years, planting targets for both research trials and pilot extension operations will be kept to a minimum. It is important to initiate research and pilot extension operations during this initial phase of the project so that research results and extension experience, however preliminary, can be used as feedback during the latter part of the project. By FY 83 with staff trained, nurseries in production and research, monitoring and training programs fully developed, emphasis will shift to extension.

The schedule for activities during the first two years of the project appear below. Technical assistance in support of these activities will be provided as described below.

1. AID/GOI

<u>Action</u>	<u>Target Date</u>
a. Project Authorization	August 1981
b. Project Agreement Signed	August 28, 1981
c. Implementation Letter No. 1 issued	September 30, 1981
d. Standard Conditions Precedent Met	November 30, 1981
e. All Conditions Precedent Met	December 30, 1981

2. MPFD

a. Planning & Research:	
Committee Established	January 31, 1982
Unit Initially Staffed	February 28, 1982
Consultant Services Begin	March 1, 1982
Research Plan Prepared	May 31, 1982
Unit Fully Staffed	March 31, 1982

<u>Action</u>	<u>Target Date</u>
b. Training:	
Consultant Service Begins	November 1981
Initially Staffed	February 28, 1982
Training Plan Prepared	June 30, 1982
Unit Fully Staffed	April 30, 1982
c. Monitoring and Evaluation:	
Unit Initially Staffed	June 30, 1982
Consultant Services Begin	July 1982
Unit Fully Staffed	October 31, 1982
d. Inter Departmental Committee Established	June 30, 1982
e. Public Affairs Office Established	June 30, 1982
f. Headquarters Staff in Place	June 30, 1982
g. Forestry Department Panchayat Agreement:	
Initiated	February 28, 1982
Completed	October 31, 1982
h. Seed Production & Storage	
Assesments begin	January 1982
Assesments complete	March 1982

B. Technical Assistance

Technical assistance will be provided by grant funds. Both U.S. and Indian consultants and Institutions will be utilized. Immediate, short-term assistance will probably be provided using an IQC or PASA. Consultant services totaling 12-15 person-months over a 12 month period are planned. Expertise in research design, extension curriculum development, seed production, and monitoring and evaluation will be required as soon as the counter-parts in the Social Forestry Directorate are appointed by the Forestry Department. A schedule for these services is included in the implementation schedule above. After appointment of key Indian staff, Mission staff and consultants will develop specifications for a second contract for technical assistance during the remainder of the project. The two step (two-contract) procedure for technical assistance can be provided via the IQC or PASA so as not to delay project implementation. Second, the development of a second, longer contract after appointment of the Indian staff will permit better definition of the types of assistance preferred and understanding of the assistance which can be obtained from Indian sources. Visits to U.S. institutions by key Indian administrative staff are planned

to permit them the opportunity to assess potential U.S. technical contributions.

To permit rapid initiation of the program several additional steps are planned. First, retro-financing of pre-project cost associated with establishment of research trials will be allowed so that the 1981 planting season (June and July) can be utilized. This will expedite the research effort and enhance the opportunity for early feedback of results. Second, the three-month training program established by the MPFD in 1980 to train extension workers will be reviewed during late 1981. The curriculum, training activities and facilities will be strengthened if necessary prior to the completion of the overall training plan in 1982. Finally, as part of the field program, personnel not in training or involved in the initial pilot program will be engaged in establishment of nurseries, production of seedlings and housing construction in support of the expanded field program.

C. Monitoring and Evaluation

1. Monitoring

As noted in Section III A-2 above, a Monitoring and Evaluation unit will be established under the Additional Director for Administration of the Social Forestry Directorate. Based on present plans the unit will have 13 professional staff by year 6 of the project, including one staff member assigned to each of the 8 zones. This unit will monitor and assess all aspects of project progress, and will prepare periodic progress reports for the use of the Social Forestry Directorate, the GOMP, GOI and AID.

Detailed guidelines about the contents and frequency of these reports will be provided to the GOI through an Implementation Letter.

USAID will carry out its monitoring functions through periodic visits by its Forestry Officer to project sites to observe first hand progress in meeting project objectives and the maintenance of project records and documents. He will be assisted in this effort by a second forester, an Indian national, who will be recruited in early FY 1982. USAID's monitoring activities will also encompass site visits to determine progress of construction activities. USAID's engineer will assist in this regard. Shortly after project initiation, USAID intends to develop a more detailed monitoring plan that will indicate frequency of USAID staff visits and specific information required for project management.

2. Evaluation & Research

It is planned that M.P. Forestry Department progress reports submitted to AID and USAID site visits will form the basis for two project reviews to be conducted by AID staff assisted by consultants. The first

review would be held in the spring of 1983 following the establishment of all the basic units of the Social Forestry Directorate. The first review would assess the results of the 1981 and 1982 planting seasons and the initial experience with establishment of pilot divisions and development of management plans. Training, research and monitoring plans will also be examined in light of this preliminary experience. The Forestry Department Panchayat agreement and supporting guidelines, the current training program and progress in seed production will also be reviewed. A team of consultants and AID staff will conduct the review, citing progress made and suggestions for remedial actions as appropriate.

A second review will be held in the spring of 1985 to assess overall project progress and determine the need for a second project. By this date sufficient data should be available for an appraisal of all aspects of the project. The review team consisting of Mission staff and consultants will examine all project elements. However, the critical question will be that of village participation. Since ultimate success of the project depends on motivating villagers to self-help, evidence indicating that they are more than passive recipients in the current program will be important. Evaluation criteria for such a determination might include:

- a) the number of villages expanding their initial project size per year;
- b) the number of panchayats assuming full responsibility for the panchvan under conditions of the agreement;
- c) demand for seedlings to be planted on private land;
- d) number of requests for participation in the program by Panchayats; and
- e) numbers of villagers assisting in and contributing to development of management plans.

Similarly the question of equitable distribution of project benefits among villagers will be important. Examples of evaluation criteria might be:

- a) the type and quantity of benefits actually delivered to villagers in various economic strata in comparison to the delivery of benefits specified in the Department-Panchayat agreement;
- b) the number and substance of complaints regarding distribution of panchvan products received by the Directorate; and
- c) the types and quantities of panchvan produce sold outside the village.

The work carried out by the Monitoring and Evaluation unit will be complemented by special studies to be undertaken by the Planning and Research unit under the Additional Director for Planning, Research and Training. The Planning and Research unit will concentrate on long range studies such as those listed in Section III A-4 above, whereas the Monitoring and Evaluation unit will concentrate on rapid feedback of information to permit mid-course corrections in project implementation. The precise division of labor between the two units will be specified in the work plans to be prepared following the establishment and initial staffing of the two units. Initial staffing of the Planning and Research and Monitoring and Evaluation units is to be completed by February

and June 1982, respectively, and work plans are to be completed by October 1982. The Social Forestry Directorate will draw upon U.S. and Indian consultants as necessary in preparing the work plans and carrying out studies. Consultant costs will be eligible for financing under the grant component of the project (see Section III F.3 above).

D. Procurement

General

Annex 12 table 4, provides the list of required project commodities and the general time frame in which they are required. All items to be financed by AID are normally eligible for AID financing and can be specified in generic, non-restrictive, terms. No proprietary and/or sole source procurement waivers are anticipated.

Source/Origin of Project Commodities

The authorized source/origin of project commodities will be AID Geographic Code 941 and India. Because of the competitive advantage offered by local manufacture, a majority of the project items are expected to be of Indian source/origin. All items are believed to be available from authorized source countries and no source/origin waivers are anticipated.

Procurement Entity

Procurement will be conducted directly by the State of Madhya Pradesh in conjunction with the Ministry of Finance. While both of these entities have experience in competitive procurement, they are largely unfamiliar with AID requirements. Accordingly, it is expected that the USAID will have to provide considerable assistance in developing acceptable bid documents. AID/W/SER/COM will assist in this task as required.

Procurement Procedures

Procurement will, to the extent feasible, be conducted by formal competitive bid procedures as specified in Handbook 11 Chapter 3. Where small value (less than \$100,000) procurements are involved, the USAID may authorize competitive negotiations. All procurements in excess of \$25,000 will be advertised in the Commerce Business Daily and the A.I.D.-Financed Export Opportunities Bulletin as well as in Indian publications. Procurement on a C & F basis is anticipated. Bid opening and evaluation will be conducted in India. The USAID will monitor the process and review and approve all award recommendation.

Insurance

The Government of India will self-insure all project commodities.

Shipping

Shipment will be by ocean freight via eligible flag carriers.

E. Disbursements

Shortly after execution of the Project Agreement, USAID will seek Direct Reimbursement Authority (DRA) from AID/W to reimburse the GOI for eligible expenditures made under the project. Disbursements will be made based on supporting documentation. These may include summary statements of expenditures and of work completed along with a certification from M.P. project authorities. The latter will retain copies of contracts, vouchers, and other records of expenses for AID monitoring and audit purposes. Guidelines for disbursement procedures will be detailed in a separate Implementation Letter. The disbursement schedule is as follows:

Disbursement Schedule (\$ millions)

<u>U.S. FY</u>	<u>82</u>	<u>83</u>	<u>84</u>	<u>85</u>	<u>86</u>	<u>87</u>	<u>Total</u>
Loan	2.3	3.4	4.3	5.2	5.8	3.0	24
Grant	.1	.2	.2	.2	.2	.1	1
<u>Total</u>	<u>2.4</u>	<u>3.6</u>	<u>4.5</u>	<u>5.4</u>	<u>6.0</u>	<u>3.1</u>	<u>25</u>

F. Conditions and Covenants

In addition to the standard conditions and covenants, the following conditions and covenants would be included in the initial Project Agreement:

1. Conditions Precedent to First Disbursement

(a) Evidence of the establishment and initial staffing of a Social Forestry Directorate, together with a statement of its scope, organizational structures and duties;

(b) Evidence of the establishment of a State Inter-Departmental Policy Committee, its constitution and a statement of its procedures and functions.

2. Condition Precedent to Disbursement for Construction

(a) Detailed drawings and specifications for all types of building to be constructed.

3. Condition Precedent to Disbursement for Forestry Plantation

(a) A description of the content of the management plan for such plantations, including the social and legal arrangements to be established with participating Panchayats.

4. Covenants

In order to meet various project requirements the Cooperating Country shall covenant the following:

(a) Evaluation. The establishment of a monitoring and evaluation unit within the Social Forestry Directorate by June 1982 and its being fully staffed by October 1982.

(b) Planning and Research. The establishment of a planning and research unit by February 1982 which is fully staffed by March 1983 and the development of a research plan by May 1982.

(c) Training. The development of a training plan under the Social Forestry Directorate by June 1982.

(d) Panchayat/Forestry Department Agreement. Sample agreements and guidelines governing legal and other relations between the Forest Department and Panchayats submitted to A.I.D. by October 1982.



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Annex 1
Page 1

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 PP RUEHD
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 ZNR UUUUU ZZH
 P 291150Z MAY 80
 FM SECSTATE WASHDC
 TO AMEMBASSY NEW DELHI PRIORITY 8431
 BT
 UNCLAS STATE 140847

AIDAC

E.O. 12865: N/A

TAGS:

7
 SUBJECT: APAC: MADHYA PRADESH SOCIAL FORESTRY PID
 (386-0475)

REFS: (A) STATE 126624, (B) NEW DELHI 9498,
 (C) STATE 122285

1. APAC APPROVED PID ON MAY 13, 1980. REF C, EXCEPT AS QUALIFIED IN THIS CABLE, SHOULD BE APPLIED AS GUIDANCE IN PROJECT PREPARATION. APAC DECISIONS AND RECOMMENDATIONS FOLLOW.

2. WHILE SUBSTANTIVE QTE FORESTRY UNQTE PROBLEMS MUST BE EFFECTIVELY ADDRESSED, WE BELIEVE KEY ELEMENT FOR PROJECT SUCCESS IS DEVELOPMENT OF A WORKABLE QTE SOCIAL UNQTE COMPONENT. INTEGRATION OF BIOLOGICAL, ECONOMIC AND CULTURAL COMPONENTS MUST BE ACHIEVED IN PROJECT DESIGN IF A VIABLE SOCIAL FORESTRY SYSTEM IS TO CONTINUE AFTER PROJECT COMPLETION.

3. PARTICIPATION: MOTIVATION AND PARTICIPATION OF VILLAGERS AND GOVERNMENT OFFICIALS NEEDS FURTHER DESCRIPTION. ALTERNATIVE MODELS FOR MOTIVATING AND ENCOURAGING VILLAGER PARTICIPATION BOTH FROM NATURAL

AND ECONOMIC VIEWPOINTS SHOULD BE DEVELOPED AND THE MODEL TO BE RECOMMENDED DEFINED IN DETAIL. PARTICIPATION SHOULD MEAN THAT VILLAGERS HAVE CONTROL OVER THE USES OF THEIR LANDS AND THAT BEHAVIORAL CHANGE IS THE GOAL. PARTICIPATION GENERALLY IS TO BE MAXIMIZED AND COST PER HECTARE MINIMIZED, RECOGNIZING THE DISTINCTION BETWEEN COMMERCIAL TREE FARMING AND SOCIAL FORESTRY AROUND VILLAGES. IT WAS POINTED OUT THAT, TRADITIONALLY, TREES GROWN IN GOVERNMENTAL NURSERIES ARE QUITE COSTLY, A CONSEQUENCE OF INFRASTRUCTURE OVERHEAD AND INEFFICIENT NURSERY PRACTICES. THIS RESULTS IN INCREASED AFForestation PROJECT COSTS. HOWEVER, THESE COSTS CAN BE GREATLY DECREASED BY TRAINING STUDENTS AND VILLAGERS IN APPROPRIATE TECHNOLOGY AND PROVIDING ADEQUATE RESOURCES TO GROW SEEDLINGS IN THEIR BACKYARDS AND AT SCHOOLS.

4. RURAL ECONOMY: GIVEN TRADE-OFFS IN VILLAGE ECONOMIES TO BE AFFECTED BY THE PROJECT AND THE FEEDGRAIN DEFICIT IN MADHYA PRADESH, THIS CAN BE VIEWED AS MUCH AS A LIVESTOCK AND GRADING PROJECT AS A FORESTRY ONE. CONCERN WAS EXPRESSED REGARDING CHANGES IN TRADITIONAL ECONOMIC PATTERNS THAT APPEAR NECESSARY TO THE PROJECT'S SUCCESS. FOR EXAMPLE, REFORESTATION IS TO TAKE PLACE ON LANDS TRADITIONALLY USED FOR GRAZING. WHERE IS THE LIVESTOCK THEN TO BE GRAZED? CONSULTANT ASSISTANCE FOR PROJECT DESIGN MIGHT BE DIRECTED TO ADDRESS THESE MICRO-ECONOMIC ISSUES.

5. MADHYA PRADESH ECONOMY: APPROPRIATE ALLOCATION OF PROJECT RESOURCES BETWEEN SOCIAL FORESTRY AS FULFILLING VILLAGE NEEDS, AND COMMERCIAL FORESTRY, NEEDS CLARIFICATION. WE UNDERSTAND THAT THE MADHYA PRADESH GOVERNMENT SUBSIDIZES URBAN FIREWOOD CONSUMPTION THROUGH THE PURCHASE OF FIREWOOD FROM RURAL AREAS FOR DELIVERY TO URBAN AREAS. THIS PRACTICE AS WELL AS THE OVERALL FUEL AND FOOD ECONOMY OF THE STATE SHOULD BE ANALYZED.

6. SEPTEL INDICATES ADDITIONAL INFORMATION REQUIRED FOR RECOMMENDATION OF NEGATIVE IEE DETERMINATION.

7. EXPECT TO DISCUSS PROJECT DESIGN NEEDS AND ANY OUTSTANDING ISSUES WITH BLOOM DURING HIS TRIP IN AID/W. MUSKIE
BT
#0847

ECONOMIC ANALYSISA. VILLAGE ANALYSIS: THE MODEL PLANTATIONS

The first step in the analysis was to synthesize two model plantations for Western Madhya Pradesh, and two for Eastern Madhya Pradesh. These will be referred to as models I and II (for the West), and models III and IV (for the East). The variations represent the differing ecological conditions as between the two regions, and different species mixes reflecting likely preferences by villagers.

With respect to fuel deficits, the Madhya Pradesh Forestry Department (MPFD) has compiled statistics on probable serious deficits in forest resources. There are 16 districts in which forest resources are not expected to last beyond 20 years. These districts (and the number of years until complete extinction at current use rates) are: BHIND (3), UJJAIN (4), SHAJAPUR (5), RAJGARH (7), BHOPAL (7), GWALIOR (8), INDORE (10), RATLAM (10), DATIA (6), DHAR (11), MANDSAUR (14), VIDISHA (16), DURG (9), REWA (13), SATNA (17), and TIKAMGARH (10). Of the 20 crucial districts, only the final 4 are in the Eastern part of the state. This deficit situation encompasses all forest products, not just fuel wood and hence models I and II are designed to be heavy on the multiproduct species. This assumption is consistent with virtually all panchvan schemes observed on the field trips.

There are a large number of tree species under consideration by the MPFD and an equally large number of other possible candidates. At this early stage it is impossible to specify the exact species composition of any future plantation. The approach followed here, therefore, has been to construct "composite plantations" which will likely represent the ultimate species mix for the two regions as a whole, although no plantation will contain these particular species in the precise densities modeled here. Yet, for State (or region) averages it is believed that these 4 composite plantations are an accurate forecast of what will exist at the end of the 5-year development stage.

Another assumption concerning species relates to the densities per hectare at which various species will be planted. Here, data from MPFD, and the World Bank appraisals for Gujarat and Uttar Pradesh were consulted, and then correlated with other findings from government agencies in India. These densities are, of course, also a function of the purposes for which a particular plantation is being established. If grass is a high priority then densities of more than 1100 trees per hectare will diminish grass yields. If, however, maximum fuelwood per hectare is desired then certain species should be planted quite close together. An average density for each selected species was chosen and retained throughout the four models; this greatly simplified the subsequent calculations. Finally, tree species were grouped into 4 categories depending upon their growth characteristics and/or their primary product. This is shown in Table 1.

To complete the economic analysis, planting costs were employed based on experience -- such costs were computed on a per-tree basis. The other major cost elements are fencing, and maintenance and protection. The major form of fencing in the Social Forestry program is to be cattle proof trenches as opposed to wire fence. Although perhaps less secure (and durable) than wire, the trenches do have much to recommend them. Firstly, they are very labor intensive; to the extent that unemployment exists, and if labor costs are covered by external funds, then net national (and State) income goes up accordingly without representing a transfer of employment away from other public-sector jobs. Secondly, the full cost of fence is retained within the State rather than leaking out to purchase wire, posts, etc. Having agreed on the form of the fence, it became necessary to assume a certain plantation size before per/hectare costs (and hence benefits) could be calculated. As will become clear below, per-hectare costs of trenching vary by a factor of 10 depending on whether one assumes a plantation size of 1 hectare or 100 hectares. In order to reduce the number of variables in the models, all benefit-cost calculations in the 4 models were made assuming fencing costs for a 10 hectare plot. Subsequent calculations will illustrate the effect on net present value (NPV) for various plantation sizes. But it warrants mention that because of this 10-hectare size assumption, net present

Table 1

<u>TREES AND GRASS SPECIES, AND MODEL PLANTING DENSITIES</u>			
<u>A. TREE SPECIES</u>			
GROUP I:	<u>HIGH VOLUME WOOD & TL</u>		
	Eucalyptus hybrid	Eucalyptus	1600/HA
	Cleistanthus collinus	Garari/Gumbar	1600/HA
	Gmelina arborea	Sewan	1600/HA
	Sesbania grandiflora		
GROUP II:	<u>FRUIT</u>		
	Mangifera indica	Mango	600/HA
	Tamarindus indica	Imli	600/HA
	Emblica officinalis	Aonla	600/HA
	Zizyphus jujuba	Ber	30/HA
	Anacardium occidentale	Kaju	600/HA
GROUP III:	<u>BAMBOO</u>		
	Dendrocalamus strictus	Manvel	156/HA
GROUP IV:	<u>ALL PURPOSE</u>		
	Leucaena leucocephala	Koo Babul	1000/HA
	Dalbergia sissoo	Sheesham	1000/HA
	Prosopis juliflora	Prosopis	1000/HA
	Acacia spp.	Babul	1000/HA
	Albizzia lebbek	Siris	1000/HA
	Terminalia tomentosa	Saja	1000/HA
	Pongamia pinnata	Kanji	1000/HA
<u>B. GRASS SPECIES</u>			
	Schima nervosum		
	Andropogon spp.		
	Cenchrus ciliaris		
	Chrysopogon montanus		
	Dicanthium annulatum		
	Eremopogon foveolatus		
	Panicum antidotale		

values per hectare are slightly over-estimated in the model plantations if plots of less than 10 hectares are planted, and these values are underestimated for plantations of a size greater than 10 hectares. This effect is illustrated in Figure 1.

The final cost component is that of a chowkidar (guard). The practice is to have one chowkidar for a plantation, almost regardless of its size. That is, a 2 hectare plot has a chowkidar, as does a 75 hectare plot. It was assumed here that a chowkidar would watch the 10 hectare plantation as well as perform minimal maintenance. For this an annual expense of Rs. 1800 was employed (Rs. 5/day). Then, as with fencing, 1/10 of this amount was used as the annual cost of the 1 hectare model plantations. As with fencing, this assumption will have a slight distortion on the net present values of those plantations other than 10 hectares in size. Such distortions are, however, minimal.

The planting and survival information (assumed at 80%) is shown in Table 2. From this the next step is to calculate frequency of harvests, and periodic yields of the various products. Two general types of plantations were first assumed, a small timber plantation, and a mixed product plantation. Data on yields and harvesting frequencies were compiled and adjusted for presumed planting densities. In all cases, yields were selected on the low side. Yield and harvesting data for these two general plantations are presented in Figures 2 and 3.

When turning to physical and economic yields from tree plantations the computations become somewhat complicated. Unlike most agricultural crops which are harvested after 6-9 months, most tree products are harvested only after 5-8 years. As seen in Figures 2 and 3, the bulk of the yields occur at 5 year intervals, with most of the timber coming at the end of 30 years when the initial plantings are liquidated. Of course, the coppicing of trees at more frequent intervals is possible for small timber production, although that has not been included here in order to place more productive emphasis on fuelwood. Intermittent yields of this sort can be annualized to present a general picture of "annual" production. The same can be done for the value of such production, though convention discourages such annualizing because of the time-value of money. That is, to

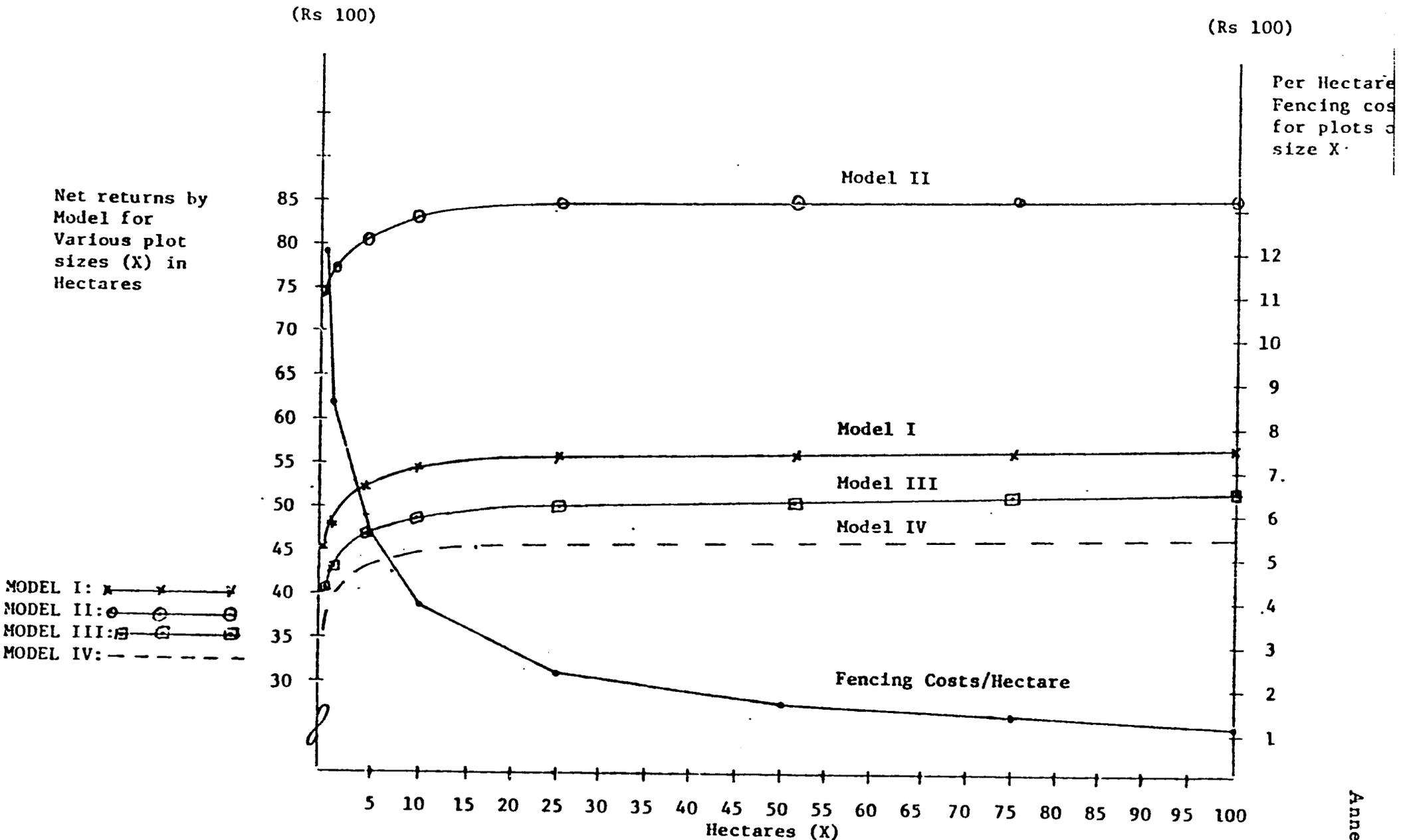


Figure 1: Per hectare net present value of four models as a function of plot size (left axis), and fencing costs per hectare as a function of plot size (right axis) (i = 10%).

Table 2

	MODEL I		MODEL II		MODEL III		MODEL IV				
	Species Composition %	Number Planted per Hectare	Number Harvested per Hectare	Species Composition %	Number Planted per Hectare	Number Harvested per Hectare	Species Composition %	Number Planted per Hectare	Number Harvested per Hectare		
GROUP I	20%			20%			30%				
Eucalyptus	(40%)	128	102	(40%)	128	102	(40%)	192	154	50%	
Cleistanthus	(30%)	96	77	(30%)	96	77	(30%)	144	115	(40%)	
Gmelina	(30%)	96	77	(30%)	96	77	(30%)	144	115	(30%)	
		<u>320</u>	<u>256</u>		<u>320</u>	<u>256</u>		<u>480</u>	<u>384</u>		
GROUP II	5%			20%			10%			5%	
Mangifera	(20%)	6	5	(20%)	24	19	(20%)	12	10	(20%)	
Tamarindus	(20%)	6	5	(20%)	24	19	(20%)	12	10	(20%)	
Eublica	(20%)	6	5	(20%)	24	19	(20%)	12	10	(20%)	
Zizyphus	(20%)	1	1	(20%)	1	1	(20%)	1	1	(20%)	
Anacardium	(20%)	6	5	(20%)	24	19	(20%)	12	10	(20%)	
		<u>25</u>	<u>21</u>		<u>97</u>	<u>77</u>		<u>49</u>	<u>41</u>		
GROUP III	10%			10%			30%			15%	
Dendrocalamus	(100%)	16	13	(100%)	16	13	(100%)	47	38	(100%)	
		<u>16</u>	<u>13</u>		<u>16</u>	<u>13</u>		<u>47</u>	<u>38</u>		
GROUP IV	65%			50%			30%			30%	
Acacia	(25%)	162	130	(25%)	125	100	(20%)	60	48	(20%)	
Prosopis	(25%)	162	130	(25%)	125	100	(20%)	60	48	(20%)	
Albizzia	(15%)	98	78	(15%)	75	60	(20%)	60	48	(20%)	
Leucaena	(15%)	98	78	(15%)	75	60	(20%)	60	48	(20%)	
Dalbergia	(10%)	65	52	(10%)	50	40	(10%)	30	24	(10%)	
Terminalia	(5%)	32	26	(5%)	25	20	(5%)	15	12	(5%)	
Pongamia	(5%)	32	26	(5%)	25	20	(5%)	15	12	(5%)	
		<u>649</u>	<u>520</u>		<u>500</u>	<u>400</u>		<u>300</u>	<u>240</u>		
GRAND TOTALS		<u>1010</u>	<u>810</u>		<u>933</u>	<u>746</u>		<u>876</u>	<u>703</u>		
										<u>1148</u>	<u>918</u>

→ = Harvest annually at indicated yield
 S = Poles/Tree
 K = Kg
 F = Fodder/Tree
 W = Wood/Tree
 T = Timber
 E = Edible Fruit

SMALL TIMBER

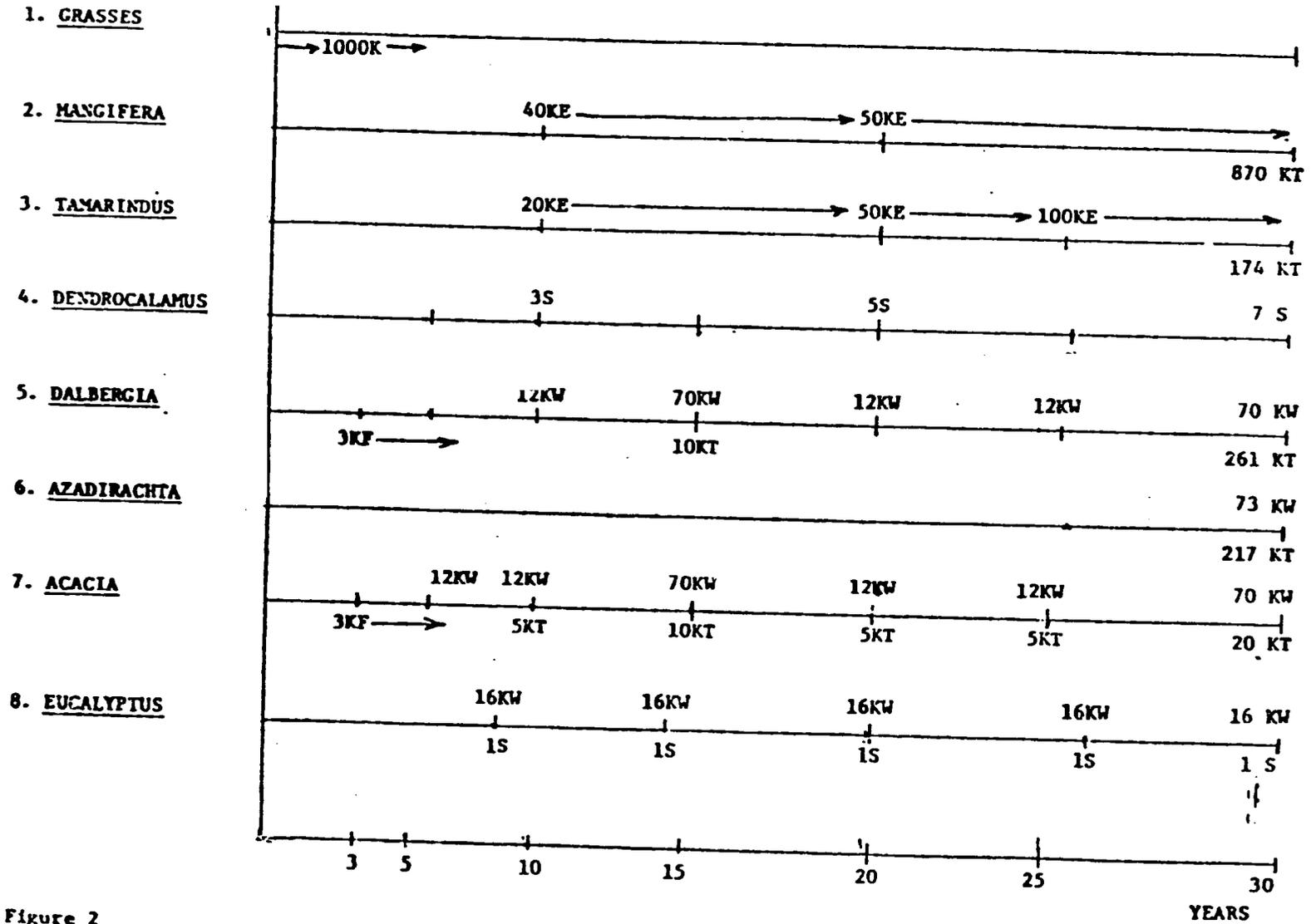


Figure 2

- = Harvest annually at indicated yield
- K = Kg.
- F = Fodder/Tree
- W = Wood/Tree
- G = Grass/HA
- P = Pods/Tree
- T = Timber/Tree
- E = Edible Fruit

MIXED PLANTATION

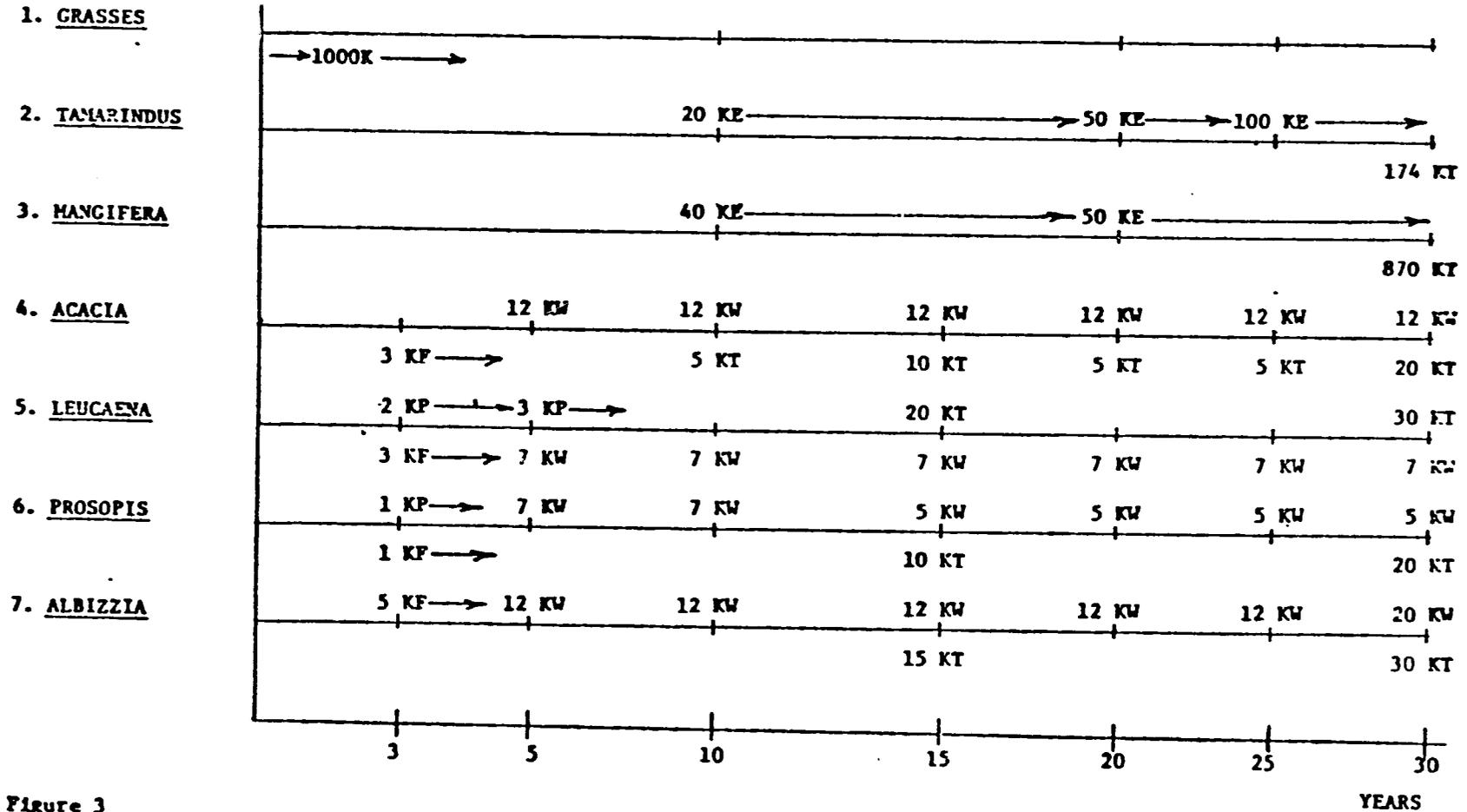


Figure 3

spread the undiscounted income received in year 30 over the 30 year life of the project introduces a distortion in the annual value of production in those early years. The discounted value of that 30th year harvest can be averaged over all years, but to do so introduces confusion with other annual net present value figures.

In what follows, we have attempted to show several things. Firstly, the total lifetime production of each product in the four models is shown. Secondly, that product is multiplied by an assumed price so that total lifetime value is shown. For crude comparisons this lifetime value (gross) is annualized (undiscounted) and also shown.

From these statistics it is possible to obtain a quick glance of the product mix, the value of that mix, and the relative (though crude) productivity of each model over its life time. It should be borne in mind that as plantations spread over the State, each with a different initial and final period (years 1 and 30), the harvests will be rotated in such a way that the sort of comparisons discussed here become more appropriate. That is, in any one year, harvests will be occurring on a complete mixture of age stands.

The results of this crude comparison of plantation production and lifetime value -- along with product mix -- are shown in Table 3.

The ultimate test of the economic value of any plantation is found in computation of net present values; this is particularly the case when each alternative (model) is similar in terms of establishment and maintenance costs. Were we comparing investment A which costs Rs. 1000 with investment B which cost Rs. 1,000,000 the net present value of each would need to be augmented with their respective benefit-cost ratios, plus their internal rate of return. But here we can be content with net present value calculations, and comparisons of the annuity value per hectare of each plantation. The annuity value represents the net annual returns from a project, and this also represents the economic loss if the project is not undertaken. The practical importance of the annuity value in a social forestry setting is that we are comparing mutually exclusive uses of a piece of land. For land currently in dryland pasture but being considered for a social forestry plantation, the annuity value of the forestry project is directly comparable with the current annual net

TABLE 3. LIFETIME YIELD, TOTAL VALUE OF YIELD, AND PRODUCT SHARE OF VALUE, FOUR MODEL PLANTATIONS, MADHYA PRADESH.

MODEL		GRASS (Rs 0.10/K)	FODDER (Rs 0.04/K)	FUEL (Rs 0.15/K)	TIMBER (Rs 0.40/K)	FRUIT (Rs 0.50/K)	PODS (Rs 0.50/K)	POLES (Rs 2.00 Each)
I	Lifetime Yield Value of Yield Share of Value	30,000K Rs 3,000 6%	42,525K Rs 1,701 3%	62,140K Rs 9,321 17%	55,105K Rs 22,042 41%	20,520K Rs 10,260 19%	10,036K Rs 5,018 9%	1,475 Each Rs 2,950 5%
II	Lifetime Yield Value of Yield Share of Value	30,000K Rs 3,000 4%	31,465K Rs 1,259 2%	52,540K Rs 7,881 10%	61,528K Rs 24,611 30%	74,420K Rs 37,210 45%	7,720K Rs 3,860 5%	1,475 Each Rs 2,950 4%
III	Lifetime Yield Value of Yield Share of Value	30,000K Rs 3,000 6%	20,825K Rs 833 2%	45,862K Rs 6,881 13%	35,290K Rs 14,116 27%	39,770K Rs 19,885 37%	5,280K Rs 2,640 5%	2,490 Each Rs 4,980 10%
IV	Lifetime Yield Value of Yield Share of Value	30,000K Rs 3,000 7%	20,202K Rs 808 2%	70,662K Rs 10,599 23%	28,328K Rs 11,331 25%	20,020K Rs 10,010 22%	5,280 Rs 2,640 6%	3,470 Each Rs 6,940 15%

TOTAL VALUE OF YIELD MODEL I -- Rs 54,292
TOTAL VALUE OF YIELD MODEL II -- Rs 80,771
TOTAL VALUE OF YIELD MODEL III -- Rs 52,335
TOTAL VALUE OF YIELD MODEL IV -- Rs 45,328

net revenue attributable to the pasture in its current use. In this respect also the annuity value of a social forestry plantation can be used as a guide in site selection; the annuity value of the plantation on a per hectare basis sets the upper bound on net returns from possible sites in their current use. That is, any current use which exceeds the forestry annuity value is better retained in its current use. The annuity value is calculated as:

$$A = \sum_{i=1}^n \frac{NPV}{(1+r)^i} \quad \therefore \text{Hectares} = A / \text{Hectares}$$

The denominator in this formulation is nothing but the sum of the discount factor for the appropriate rate of discount (r) for the life of the plantation (n). This can be found by simply summing the discount factors over n years in a table entitled "Discount Factors" or "Present Worth of an Annuity."

The economic situation for each of the model plantations is presented in Table 4.

As the final step in the village level analysis it is necessary to relate these model plantations to the economic condition of village India. Here again, heroic assumptions are necessary in that no village situation can truly be described as "typical." Nonetheless, it is possible to demonstrate some general impacts on villages of presumed size.

We start by assuming that 24 hectares of Model I are planted near a village of 400 persons (67 families) in the West. In the East, 48 hectares of Model III are planted near a village of 800 persons (133 families). We can then imagine that each plantation is managed on a sustained yield basis so that rotations allow an annual offtake. For the 2 models, we would have the following general rotations:

Grass:	Every Year
Fodder:	Every Year
Fuelwood:	Every Sixth Year
Timber:	Every Fifteenth Year
Fruit:	Every Year
Pods:	Every Year
Poles:	Every Sixth Year.

TABLE 4. ECONOMIC SUMMARY, FOUR MODEL PLANTATIONS.

	WEST				EAST			
	Model I		Model II		Model III		Model IV	
A. COSTS:								
1. Initial Costs								
a. Seedlings @ Rs 0.55	Rs 556		Rs 513		Rs 482		Rs 631	
b. Planting @ Rs 0.64	Rs 646		Rs 597		Rs 561		Rs 735	
c. Fencing @ Rs 400/HA	Rs 400		Rs 400		Rs 400		Rs 400	
2. Recurring Costs								
a. Protection/Maintenance @ Rs 180/HA/Year	Rs 180/year		Rs 180/year		Rs 180/year		Rs 180/year	
B. RETURNS IN PRESENT VALUES (Rs)								
	10%	15%	10%	15%	10%	15%	10%	15%
1. Gross Present Value	8,704	4,529	11,483	5,556	8,027	4,088	7,928	4,261
2. Initial Cost	-1,602	-1,602	-1,510	-1,510	-1,443	-1,443	-1,766	-1,766
	7,102	2,927	9,973	4,046	6,584	2,645	6,162	2,495
3. P.V. of Recurring Costs	-1,724	-1,226	-1,724	-1,226	-1,724	-1,226	-1,724	-1,226
4. Net Present Values	5,378	1,701	8,249	2,820	4,860	1,419	4,438	1,269
5. Annuity Values per Hectare	571	258	876	429	516	216	471	193
6. Internal Rate of Return	22%		24%		20%		19%	

To simplify matters, we might ignore the timber harvest and imagine a six-year rotation for fuelwood and poles, plus an annual harvest for the other four products.

This means that in a 24 hectare plantation we would harvest 100% of the area (24HA) for grass, fodder, fruit, and pods, plus 1/6 of the area (4HA) for fuelwood and poles. For the 48 hectare plantation we would harvest 48 hectares annually for grass, fodder, fruit, and pods, and 8 hectares for fuelwood and poles. The results of these harvesting assumptions for the two models are shown in Tables 5 and 6.

The nature of the village and the agreements struck will influence the way in which the products from a village plantation will be distributed. For instance, the Panchayat may choose to manage the plantation exclusively for revenue generation and sell all produce. This scenario seems quite unlikely. A more probable situation will be to market some of the product, and to retain the balance within the village for local needs.

Recall that we assume that Model I (West) is located on the lands of a village containing 400 persons (67 families), and Model III (East) is located in a village of 800 persons. Further, let us assume that the following distributions are effected for Model I (Table 9), and Model III (Table 10).

In this simple calculation, which ignores the timber harvest at 15 and 30 years, we see that the sort of village plantations envisioned in the project could be expected to have an important impact on individual villagers. The product from 24 hectares of Model I (West) situated in a village of 67 families would provide both village revenue, and important commodities for direct consumption. The significance of this to each family is highlighted in the final column of Table 7. For instance, each family could obtain 2 1/2 months of fodder for 2 cows/carabao, plus protein supplement for that same period. Additionally, the fuelwood could be expected to match 15% of current wood use. This would have several important implications. If wood is gathered in the forest this reduces pressure on an already strained resource, plus alleviates the need for as many trips. Alternatively, if wood is purchased from a

TABLE 5. ANNUAL PRODUCTION AND VALUE FROM 24 HECTARES OF MODEL I (ON 6-YEAR ROTATION AND EXCLUDING TIMBER)

PRODUCT	ANNUAL YIELD PER HECTARE	HECTARES HARVESTED ANNUALLY	GROSS ANNUAL HARVEST	GROSS ECONOMIC VALUE	PRODUCT SHARE OF ANNUAL VALUE
Grass	1000K	24	24,000K	Rs 2,400 @ 0.10/K	14%
Fodder	1418K	24	34,032K	Rs 1,360 @ 0.04/K	8%
Fuelwood	2070K	4	8,280K	Rs 1,242 @ 0.15/K	7%
Fruit	680K	24	16,320K	Rs 8,160 @ 0.50/K	46%
Pods	335K	24	8,040K	Rs 4,020 @ 0.50/K	23%
Poles	50 Each	4	200 Each	Rs 400 @ 2.00 Each	2%
				Rs 17,582	100%

TABLE 6. ANNUAL PRODUCTION AND VALUE FROM 48 HECTARES OF MODEL III (ON 6-YEAR ROTATION AND EXCLUDING TIMBER)

PRODUCT	ANNUAL YIELD PER HECTARE	HECTARES HARVESTED ANNUALLY	GROSS ANNUAL HARVEST	GROSS ECONOMIC VALUE	PRODUCT SHARE OF ANNUAL VALUE
Grass	1000K	48	48,000K	Rs 4,800 @ 0.10/K	11%
Fodder	690K	48	33,120K	Rs 1,325 @ 0.04/K	3%
Fuelwood	1530K	8	12,240K	Rs 1,836 @ 0.15/K	4%
Fruit	1320K	48	63,360K	Rs 31,680 @ 0.50/K	70%
Pods	175K	48	8,400K	Rs 4,200 @ 0.50/K	9%
Poles	80 Each	8	640 Each	Rs 1,280 @ 2.00 Each	3%
				Rs 45,121	100%

TABLE 7. MODEL I (WEST) ON 24 HECTARES OF VILLAGE LAND, 67 FAMILIES.

PRODUCT	ANNUAL HARVEST	% SOLD IN MARKET	VILLAGE REVENUE	AVAILABLE FOR VILLAGE USE	ANNUAL PRODUCT PER FAMILY	COMMENTS
Grass	24,000K	0	0	24,000K	358K	Will feed 2 cows/carabao for approximately one month.
Fodder	34,032K	0	0	34,032K	508K	Will feed 2 cows/carabao for approximately 6 weeks.
Fuelwood	8,280K	0	0	8,280K	124K	Represents approximately 14% of current annual wood use. Permits substitution for 23% of current dung use. 234K of dung can be diverted to manuring.
Fruit	16,320K	50%	Rs 4,080	8,160K	122K	Provides 2/5K fruit per week for each family member.
Pods	8,040K	0	0	8,040K	120K	Will feed (as protein supplement) 2 cows/carabao for two months.
Poles	200 Each	75%	Rs 300	50 Each	0.75 Each	
Income			Rs 4,380			Revenue to Panchayat.

TABLE 8. MODEL III (EAST) ON 48 HECTARES OF VILLAGE LAND, 133 FAMILIES.

PRODUCT	ANNUAL HARVEST	% SOLD IN MARKET	VILLAGE REVENUE	AVAILABLE FOR VILLAGE USE	ANNUAL PRODUCT PER FAMILY	COMMENTS
Grass	48,000K	0	0	48,000K	361K	Will feed two carabao for approximately one month.
Fodder	33,120K	0	0	33,120K	250K	Will feed two carabao for approximately 3 weeks.
Fuelwood	12,240K	0	0	12,240K	92K	Represents 13% of current annual wood use. Permits substitution for 13% of current dung use. 174K of dung can be diverted to manuring.
Fruit	63,360K	50%	Rs 15,840	31,680K	238K	Provides 3/4K fruit per week for each family member.
Pods	8,400	0	0	8,400K	63K	Will feed (as protein supplement) two carabao for one month.
Poles	640 Each	75%	Rs 960	160 Each	1.2 Each	
Income			Rs 16,800			Revenue to Panchayat

government supply depot this would permit a savings of money which could be used for other things. Finally, it may be possible to reduce the extent of government fuelwood distribution programs, with an accompanying saving in national financial resources.

Table 8 shows a similar summary for Model III in proximity to a village in the East.

There are two remaining (and related) issues to be discussed at the level of the village, both of which have a profound impact upon the success of a social forestry program. The first of these is the matter of the type of contractual agreement which exists between the government of Madhya Pradesh and the village/panchayat. The second is the willingness of the village to dedicate its lands to social forestry.

To assess the nature of the contract as it influences village interest in social forestry, consider again Table 7 (Model I). The sample contract indicates that the harvested produce of a plantation will be placed at the disposal of the village, minus harvesting costs and (an unspecified) royalty payment. Then, the balance will be sold and the proceeds split evenly between villagers and government. This means that of the market value of Rs. 4380 in Table 7, we must subtract harvesting costs and a royalty payment. Assume average harvesting cost of Rs. 50/ hectare for all products, and a 5% royalty on the total value of the product (Rs. 17,582 in Table 5). Total harvesting costs for 24 hectares are Rs. 1,200 and 5% of 17582 is Rs. 879. The sum of this financial obligation to the government is Rs. 2,079. If this must be paid out of the 50% village share of the auctioned produce, then the village gains only Rs. 111 in revenue for the allocation of 24 hectares to social forestry. This is Rs. 5/hectare. Of course, the village gains use of the produce not sold, but the terms of the contract may be too severe to elicit much interest on the part of many villages.

Finally, we come to the economic of land use in a village as it influences village participation in social forestry. As land is taken out of its current use to be put into social forestry the amount of remaining land which can be used as it formerly was begins to shrink. And, we know that as an asset becomes increasingly scarce, it also becomes increasingly dear. One of the major elements in the acceptance of social forestry at the village level concerns this balancing of net returns to land in the two alternative uses.

Those lands with the lowest economic value in their current use (and also of high potential value in social forestry because of site capability) will be the first to be selected by the village and the government for plantations. But as the fraction of village lands so dedicated increases, the remaining lands become increasingly scarce. As this value increases, then the scale of expansion of the village level will be controlled by the ever decreasing differential between the two annuity values. Ultimately a point will be reached at the village level where the two annuity values are brought into equality and social forestry ceases to be a viable alternative land use. This is illustrated as H^* in Figure 4.

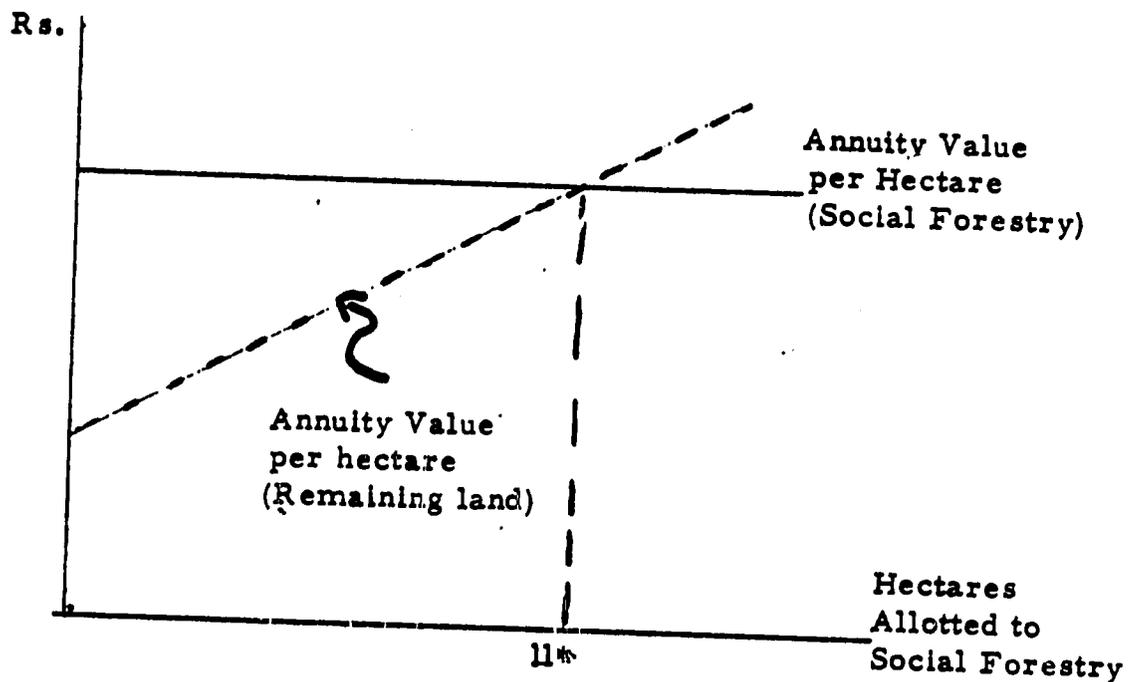


Figure 4

During the early stages of social forestry the increase in the value of remaining land will be rather rapid. However, as the plantations become productive the produce will replace that which has been lost and eventually the value of those remaining lands will return to their former level, if not actually below their former value; this will depend on the way in which these remaining lands are cared for.

Summary

The analysis of social forestry at the village level indicates a considerable potential for improving several aspects of rural life. The fruit products will make possible an improved diet as well as provide much needed income to villagers. The grass and fodder from the plantations could contribute as much as 15-20 percent of livestock needs. It is possible that a similar percentage of fuelwood needs could be met, permitting the diversion of a much greater quantity (by weight) of valuable dung to cultivated fields. Fuelwood has almost twice the heat value per kilogram as does dung, and hence .53K of wood will displace .1K of dung. This magnitude of dung saved for manuring could have an important impact on agricultural yields. Timber production has played a rather minor role in the model plantations but it should not be overlooked that the market value of this product is 3-4 times that of fuelwood. To the extent that timber was excluded from Tables 5 - 8 we have underestimated the full impact at the village level.

Before leaving the village level analysis the issue of "pure" fuelwood plantations must be addressed. Given the concerns for rural energy supplies in India the obvious question becomes one of the feasibility of plantations created for the sole purpose of providing a maximum harvest of fuelwood. To explore this consider Model V. Here, in contrast to the earlier models, only Group I and Group III species are planted (Table 9). The yield, value of product, and product share of value from Model V are shown in Table 10. The economic summary for this fuelwood Model is in Table II.

As with the previous four models it is useful to relate the product from such plantation to a village situation. As in Tables 5 and 6, assume that 24 hectares of Model V are planted near a village of 400 persons (67 families) in the West, and that 48 hectares of Model V are planted near a village of 800 persons (133 families) in the East. Each plantation will be managed on a sustained yield basis, with fuel and poles harvested every sixth year from a given area of land. Additionally, bamboo poles are available every tenth year. This means that in a 24 hectare plantation an annual harvest from Group I species could occur on 4 hectares, and bamboo poles could be harvested on 2.4 hectares. On the 48 hectare plantation an annual harvest of Group I species could occur on 8 hectares, while bamboo poles could be harvested from 4.8 hectares. The results from these two harvesting assumptions are shown in Table 12.

TABLE 9

MODEL V			
	SPECIES COMPOSITION %	NUMBER PLANTED PER HECTARE	NUMBER HARVESTED PER HECTARE
<u>GROUP I</u>	90%		
Eucalyptus	(40%)	576	460
Cleistanthus	(30%)	432	346
Gmelina	(30%)	432	346
		<u>1440</u>	<u>1152</u>
<u>GROUP III</u>	10%		
Dendrocalamus	(100%)	<u>16</u>	<u>13</u>
		<u>16</u>	<u>13</u>
GRAND TOTALS		<u>1456</u>	<u>1165</u>

TABLE 10 LIFETIME YIELD, TOTAL VALUE OF YIELD, AND PRODUCT SHARE OF VALUE, MODEL V, MADHYA PRADESH.

	Fuel (Rs 0.15/K)	Poles (Rs 2.00 each)	Total Value
LIFETIME YIELD	92,160	5955	
VALUE OF YIELD	Rs 13,824	Rs 11,910	Rs 25,734
SHARE OF VALUE	54%	46%	

TABLE 11. ECONOMIC SUMMARY, MODEL V.

A. COSTS			
1. Initial Costs			
a.	Seedlings @ Rs 0.55 x 1456	=	801
b.	Planting @ Rs 0.64 x 1456	=	932
c.	Fencing @ Rs 400/HA	=	<u>400</u>
			Rs 2,133
2. Recurring Costs			
a.	Protection and Maintenance:	Rs 180/HA/YR	
<hr/>			
B.	RETURNS PER HECTARE (PRESENT VALUES)	10%	15%
1.	Gross Present Value	5231	2920
2.	Initial Costs	<u>-2133</u>	<u>-2133</u>
		Rs 3098	Rs 787
3.	P.V. of Recurring Costs	-1724	-1226
4.	Net Present Values	Rs 1374	-Rs 439
5.	Annuity Value =	$\frac{1374}{9.42} = 146$	$\frac{-439}{6.58} = -67$
6.	Internal Rate of Return	13%	

TABLE 12. ANNUAL PRODUCTION AND VALUE FROM 25 AND 48 HECTARES OF MODEL V.

	24 HECTARES (West)		48 HECTARES (East)	
	FUEL	POLES	FUEL	POLES
ANNUAL YIELD PER HECTARE	3072K	198 each	3072K	198 each
HECTARES HARVESTED ANNUALLY	4	2.4	8	4.8
GROSS ANNUAL HARVEST	12,288K	475 each	24,576K	950 each
GROSS ECONOMIC VALUE	Rs 1,843 @0.15/K	Rs 950 @2.00 each	Rs 3,686 @0.15/K	Rs 1,900 @2.00 each
PRODUCT SHARE OF ANNUAL VALUE	66%	34%	66%	34%

The implications of Model V for the two villages can be described as previously done for Models I-IV. As in Tables 7 and 8, the fuelwood implications are predicated upon the following assumed current fuel use per family:

TABLE 13 *

	WEST		EAST	
	(Kgs)	%	(Kgs)	%
WOOD	900	40%	720	30%
DUNG	1020	44%	1356	55%
AGRICULTURAL WASTES	390	16%	390	15%
TOTALS	2310		4266	

*For conversion to equal heat value assume that 1 Kg of wood equals 1.99 Kg of dung, and 1.08 Kg of agricultural wastes.

These results are shown in Table 14. Comparing the results with those from Tables 7 and 8 reveals that the pure "energy" plantations of the assumed sizes would meet approximately 20.25% of current fuelwood consumption. This gain over the mixed plantations would come at the expense of grass, fodder, pods, and fruit.

This issue of the appropriate type of plantation will need to be resolved on a village-by-village basis. Where local conditions permit, the choices of the villagers should dominate in plantation composition. If harsh conditions rule out certain preferred mixtures then "second" alternatives must be considered.

TABLE 14. MODEL V ON 24 HECTARES OF VILLAGE LAND IN THE WEST (67 FAMILIES) AND ON 48 (HECTARES) OF VILLAGE LAND IN THE EAST (133 FAMILIES).

	WEST 24 HECTARES 67 FAMILIES		EAST 48 HECTARES 133 FAMILIES	
	FUEL	POLES	FUEL	POLES
ANNUAL HARVEST	12,288K	475 each	24,576 K	950 each
PERCENT SOLD IN MARKET	0	75%	0	75%
VILLAGE REVENUE	0	Rs 712	0	Rs 1,424
AVAILABLE FOR VILLAGE USE	12,288K	119	24,576K	238
ANNUAL PRODUCT PER FAMILY	183K	1.8 each	185K	1.8 each
VILLAGE INCOME	0	Rs 712	0	Rs 1,425
COMMENTS	Represents approximately 20% of current annual wood use. Permits substitution for 34% of current dung use. 346K of dung can be diverted to manuring.			Represents approximately 26% of current annual wood use. Permits substitution for 26% of current dung use. 348K of dung can be diverted to manuring.

B. OVERALL BENEFIT COST ANALYSIS

Any expenditure of public-sector funds for investments in projects such as social forestry sets into motion a whole chain of beneficial and adverse effects, the nature and extent of which can only be imperfectly measured. Indeed, there is a benefit-cost analysis where the economist is aware of the marginal benefit of yet one more assumption and subsequent calculation. As assumptions become ever more tenuous, and/or as reasonable impacts ripple through the system, it soon becomes prudent to ignore subsequent effects. This will become obvious in the following discussion.

In the evaluation of the Madhya Pradesh social forestry program we will be concerned with both direct and indirect benefits and costs, and with those which are expressible in monetary terms, and those which can only be expressed in non-monetary terms. There are three broad classes of direct effects, and four broad classes of indirect effects. As for the former, we have gross benefits which accrue to the direct beneficiaries of the project, associated costs which must be incurred by the direct beneficiaries in order to receive the benefits of the project, and finally projects costs. Concerning the indirect effects we have four kinds: indirect effects stemming from the plantations, indirect effects induced by the plantations; indirect effects induced by consumption by the direct beneficiaries; and indirect effects induced by planting and maintaining the project. Net indirect benefits in these four only exist to the extent that the gross beneficial effects exceed the gross costs.

We now treat each of the categories in more detail.

Direct Gross Benefits

At the village/panchayat level, we will treat all households as our basic unit of analysis. Obviously it would be superior to use the individual family as the basic unit but that would require precise knowledge concerning the distribution of benefits among individual families -- a level of the detail clearly absent for

the present. With the village being the basic analytical unit, the direct gross benefits are those effects which make the village as a whole better off. We have seen that the four model plantations are capable of generating approximately Rs. 600 (as an average) of net returns per hectare at a discount rate of 10%. This is arrived at by imputing prices to the various products arising from the respective plantations.

It is unlikely that all of the produce from the plantations will be sold, but instead a significant fraction of it may be consumed directly. This is particularly the case for grass, fodder, fuelwood, and pods. Alternatively, fruit, poles, and timber are likely to be marketed. Regardless of the ultimate disposition of the product, we may safely impute values to it on the grounds that if it is consumed rather than sold it represents an income loss of the magnitude of its market value. Hence the gross benefits to a village are the economic value of the plantations products.

There are some non-monetary benefits which will also accrue at the village level. One of the more important of these will be the improved nutritional composition of the typical diet -- especially if much of the fruit is consumed rather than sold. Even if some of it is sold and other nutritious foods purchased with the revenue diets will improve.

Another direct non-monetary benefit would be the vitalization of the village as an economic decision unit. At Independence control of much of the resource base was transferred to something called "the Government" with a corresponding decline in village management. Social forestry would revive the tradition of village management of a valuable natural resource. This should also enhance the concept of village identity and cohesion which may have been threatened by the gradual deterioration of village assets and the irresistible urge to get at least a little of the ever-decreasing forage available for livestock.

The final non-monetary direct benefit can be considered to be the protection of the land included in a plantation, and other lands downstream from same. We must be careful not to double count by including here those benefits which are already captured in the per-hectare annuity values. This category of beneficial effects comprehends those which go beyond the mere market-valued gains from social forestry. Erosion control is one obvious category, as are the benefits arising from protection as a wind break.

The second category of direct effects are referred to as associated costs: There are a number of expenses which must be incurred in order that the gross benefits can be realized. It is the difference between gross benefits and associated costs which gives rise to net direct benefits.

One major item in associated cost would be the expense which must be incurred to protect the plantation once it is established. This involves a chowkidar and in the calculations presented in the village analysis these costs were netted out to arrive at the net present values and the annuity values. Yet another expense would be any required maintenance which must be performed annually to keep the plantation productive. As with the chowkidar, this expense has been subtracted from the gross benefit figures presented in the earlier discussion on village level analysis.

An important item which must be included in associated costs is the opportunity cost of using the land as a plantation rather than it in its former use. This figure was not included in the earlier village level calculations and hence the annuity values listed there overstate the net economic gain from social forestry. It is not an easy matter to determine this economic opportunity cost. A lower bound would be the economic return (annuity) in its current use. This is a lower bound for two reasons. Firstly, the open grazing land provides both time and space utility to the village, in addition to its form utility which we would capture in our normal economic calculations. Put in slightly different terms, the land has its use value, and its exchange value. The former represents

what the villager would gain from its productivity toward the sustenance of livestock ignoring its place in the annual grazing cycle. The latter (exchange) value represents what the villager would require by way of compensation to be denied its use. This value reflects the probable cost of purchasing a replacement for the lost land. Consider the following illustration. One hectare of degraded range land may produce forage worth only Rs. 50 annually -- this is its use value. However, if denied access to it, villagers may be required -- during certain times of the year -- to purchase forage to sustain their livestock. If that necessary forage would cost Rs. 200 then this represents the minimum that the villagers would accept to be denied access to the land; this is the exchange value of one hectare.

The final monetary associated cost is the necessary repayment obligation of the village to the Forest Department. Note that this does not affect the economic desirability of the project from the social perspective for an entry in associated cost account is offset by an equal entry (only a negative amount) in the project cost account. Of course repayment is central to a village's perception of its gains from a plantation, and also from the government's perspective.

The sample contract proposed by the MPFD indicates a 50-50 split of the proceeds after harvesting costs have been deducted, along with an unspecified royalty payment to the government. Depending upon the level of this royalty payment it is quite easy for a social forestry project to be unprofitable from the village's point of view, and quite attractive to the government.

Consider the following example of how the proposed contract might affect villages. It is stated that the harvested proceeds will be placed at the disposal of the villagers minus harvesting cost and royalty. Assume the following:

Rs. 550	Productive value
- Rs. 50	Harvesting
- <u>Rs. 55</u>	10% Royalty
Rs. 445	

If the village chooses to utilize Rs. 225 of this in direct consumption, that leaves Rs. 220 worth to sell. If the proceeds are split 50/50 then the village realizes an additional Rs. 110. Finally assume that the current land use is grazing which has an annuity value only 1/2 of that were it to be devoted to social forestry. This must be subtracted from the village's calculations to determine its net position. This is shown below for both government and the village:

INCOME OR VALUE TO:

<u>Village</u>	<u>Government</u>
Rs. 225 consumed Product	Rs. 55 Royalty (10%)
Rs. 110 Sale Proceeds	Rs. 110 Sale Proceeds
335	
- Rs. 275 Opportunity cost of land use	<u>Rs. 165</u> NET GAIN
<u>Rs. 60</u> NET GAIN	

Are we really to suppose that villages will enthusiastically donate land to social forestry for a net gain of Rs. 60 per hectare?

This question can be evaluated in light of the final consideration in associated costs -- albeit a non-monetary cost. This pertains to the loss of "freedom" which villagers might feel in turning over grazing land to the government. This is more than income loss; it is a loss of individual discretion in resource management. Of course to be offset against this is the social cost which such individual behavior has wrought; the degraded range.

Turning finally to project costs, we encounter the usual types of expenditures for seeds, planting, fencing, nurseries, protection, maintenance, and overhead. These direct costs reflect the actual cash outlays of the Madhya Pradesh government, regardless of the ultimate contributor (such as A. I. D. or the villages via repayment). It is important that all costs be shown in this account, with subsequent reimbursements deducted in a separate account.

The earlier discussion about repayment obligations by villages is pertinent here.

We now turn to a discussion of the indirect effects from a social forestry program. In the monetary account we find the possibility for new village, state and national income to be created through the establishment of forest-based cottage industries. A second example can be found in the enhancement of the local milk production which increases value added at regional (or local) milk processing facilities. In both instances, the purchase of forest products from the villages represents costs to these related sectors, and the source of income to the villages (which we have earlier referred to as direct gross benefits). The existence of a positive value-added figure in those economic sectors utilizing new forest resources represents a net gain to income in the locality. To the extent that this does not reduce the price of existing forest products or milk products -- and thereby reduce incomes of other producers -- then the State and the Nation gain by this full amount.

An example of a non-monetary indirect effect is to be found in the offsite enhancement of watershed protection. It may or may not be possible to impute a monetary value to the reduced siltation of streams and reservoirs. If the economic life of a reservoir is extended by 10 years then it is clear that the present value of that deferred expenditure is an indirect monetary benefit.

All of these indirect effects carry the appellation "indirect benefits stemming from the project."

The second class of indirect effects arises because of a positive difference between gross benefits and associated costs. That is, when the project leaves villagers with increased net income over and above necessary expenses (chowkidar, maintenance, royalty payments, etc.) there is new income in the village which will be spent on a variety of consumer goods, or education for children, or for travel to the regional capital. When this new expenditure results in a net income gain to respective suppliers (over and above their associated costs) then we have net indirect benefits induced by consumption.

The third category of indirect effects arise from the associated costs which must be incurred by the direct beneficiaries (villagers) in order to realize the gross income. These costs would be wages to chowkidars, maintenance people, and those who harvest the produce. There are net indirect benefits induced by the plantations to the extent that these workers lose less by giving up their former jobs than they gain in this new employment. Assume that these personnel were formerly working for Rs. 4.50/day in the agricultural labor force, but are now paid Rs. 5.00/day in the employ of village panchayats. Their income goes up by Rs. 0.50 per day and this represents a real income gain to the locality, the State and the nation rendered possible by the establishment of a more valuable resource.

The final category of indirect effects are referred to as net indirect effects induced by the project. One example is the labor cost component. As in the above category there is a potential gain in net national income if the new wage exceeds the former wage; and if people would have been otherwise unemployed their opportunity wage is zero. In this instance the full wage payment is a net gain. A second possible source of national (or regional) gain is the value added which is created in private seed supply firms from a social forestry plantation.

There are in addition to the above, two redistributive issues which now warrant discussion; they both apply to most cost categories.

Firstly, if the S. F. program causes wages to be increased (as we assumed above) then it is quite likely that employers in the locality will be forced to pay their existing workers something more in order to prevent their flight to tree planting, etc. These other workers clearly gain by the fortuitous conditions which brought such a large government program to Madhya Pradesh. We must assume that existing wages would increase slightly, and that this would come out of the pockets of owners of capital who also hire labor, or else it will be passed on to consumers. At any rate, this represents a small income transfer toward workers and away from consumers and entrepreneurs. In a State such as Madhya Pradesh we should not ignore this possibility.

The other redistribution concerns income payments to workers in a S. F. program. It is clear that incomes in Madhya Pradesh will go up as all of the anticipated labor is actually employed. What is not so clear is whether or not incomes somewhere else in India fall as a result of this. That is, if the Indian government reduces public sector jobs in another state (or even elsewhere in M. P.) by an amount exactly equal to the wage bill in S. F. then net national income in India remains unchanged.

This is unlikely since A. I. D. funding will underwrite some of the labor cost, we might expect employment (and incomes) elsewhere to be largely unaffected.

By way of summary, these various types of benefits and costs are illustrated in Figure 5. A final tally of the gains and losses is a rather demanding undertaking, but given the favorable benefit-cost assessment of the village-level plantations there seems little chance that the overall program benefits would not be comfortably positive. It is possible to present a general picture of the overall benefit-cost picture for the first five year program even ignoring the indirect effects. To do this we must hypothesize a mix of the various models developed earlier. Ignoring the pure fuelwood model (V), we assume the mix depicted in Table 16. Here, it is assumed that the 85,800 hectares in the five-year program are allocated to the four plantations as shown. The aggregate value excluding government overhead costs of the program is Rs. 221,670,000 net of all other costs including an assumed value of current land use. For the 85,800 hectares this averages out to Rs. 2584 per hectare. To compute the net annuity value for a discount rate of 10% we compute: $Rs. 2584 \div 9.42$ which yields Rs. 274 per hectare. This represents the net economic value per hectare generated annually by social forestry. The internal rate of return for the composite shown in Table 16 would be the weighted average (by area) of the four models. This is approximately 22%.

FIGURE 5. DIRECT AND INDIRECT BENEFITS AND COSTS FROM SOCIAL FORESTRY

EFFECTS	MONETARY / NON MONETARY	DIRECT GROSS BENEFITS	DIRECT ASSOCIATED COSTS	DIRECT PROJECT COSTS					
		<p>New Income or Reduced Costs</p>	<p>Chokidar Village Maintenance Foregone Income from Plantation Lands Harvesting Costs Village Cost Obligations</p>	<p>Seeds Planting Fencing Nurseries Overhead Maintenance Protection Possible Transfer (Offset) Minus the cost savings from Reduced Wood Depot Needs.</p>					
	NON MONETARY	Better Diet Village Identity Strengthen Pauchayat Land Protection	Loss of "Freedom" to Graze Planted Lands						
INDIRECT EFFECTS	MONETARY	INDIRECT BENEFITS SPENDING FROM PLANTATIONS		INDIRECT BENEFITS INDUCED BY CONSUMPTION		INDIRECT BENEFITS INDUCED BY PLANTATIONS		INDIRECT BENEFITS INDUCED BY THE PROJECT	
		<u>BENEFITS</u> Gross Value Added in Forest Products Industry	<u>COSTS</u> Purchases by Forest Products Industry	<u>BENEFITS</u> Gross Income to Suppliers of New Household Purchases	<u>COSTS</u> Purchases by Household Suppliers	<u>BENEFITS</u> Income to Chokidar	<u>COSTS</u> Foregone Chokidar Income	<u>BENEFITS</u> Labor Income	<u>COSTS</u> Foregone Wages
		Value Added in Dairy Sector	Costs of Purchased Milk from Farmers			Income to Harvesters	Foregone Harvester Income	Higher Induced Wages in Other Sectors	Higher Induced Wages in Other Sectors
						Income to Maintenance Workers	Foregone Income to Maintenance Workers	Income to Private Seed Producers	Factor Costs in Private Seed Sector
	NON MONETARY	Watershed Protection							
		If B > C then have net indirect benefits from Plantations.	If B > C then have net indirect benefits induced by Consumption.	If B > C then have net indirect benefits induced by Plantations.	If B > C then have net indirect benefits induced by the Project.				

TABLE 16.

	<u>MODEL I</u>	<u>MODEL II</u>	<u>MODEL III</u>	<u>MODEL IV</u>	<u>TOTALS</u>
Percent of Plantation Area	40%	10%	30%	20%	
Hectares	34,320	6,580	25,740	17,160	85,800
Total Production Value (Gross present value) Rs. @ 10% interest	2.9872×10^8	0.98524×10^8	2.0661×10^8	1.3604×10^8	7.39694×10^8
Present Value of recurring costs	0.59167×10^8	0.14792×10^8	0.44376×10^8	0.29584×10^8	1.47919×10^8
Net Value	2.39553×10^8	0.83732×10^8	1.62234×10^8	1.06456×10^8	5.91975×10^8
Initial Costs	0.54981×10^8	0.12956×10^8	0.37143×10^8	0.30305×10^8	1.35385×10^8
Opportunity cost of foregone production	0.97057×10^8	0.24264×10^8	0.65071×10^8	0.48528×10^8	2.3492×10^8
Aggregate Value Net of Initial Costs and Foregone Production	0.87515×10^8	0.46512×10^8	0.60020×10^8	0.27623×10^8	2.21670×10^8

Annex 3
Table 1

ANNUAL PLANTING TARGETS BY PLANTATION TYPE & PURPOSE

TYPE	PURPOSE	PRODUCT EMPHASIS	COST (Rs) Per ha	81-82	82-83	83-84	84-85	85-86	86-87	TOTAL
				Panchvan mixes species	General supply of forest products for village needs	Firewood, greenfodder, small timber, fruit, grass	1,700	225	1137	6093
Silva pasture	Augmentation of livestock feed	Grass, green fodder, firewood	1,100	0	270	1530	2700	3450	4110	12060
Roadside	Public awareness and aesthetics	Firewood, fodder shade	10,000	0	18	102	180	230	274	804
Experimental	Research (species trials)	Firewood, fodder	3,000	1200	1500	0	0	0	0	2700
				1425	2925	7725	13575	17250	20550	63450

Acacia Arabica	Babul	Fuel, small TBR, fodder, gum, tannin, coppices in dry are enriches soil.
Acacia Auriculiformis	Australian Acacia Akashmoni	Fodder, fuel, coppice, enriches soil
Acacia Catechu	Khair	Charcoal, dye (cutch), tannin
Acacia Nilotica	Babul	Fuel, kataa (pans), timber, enriches soil, posts, tool Coppices
Albizia Lebbeck	Siris	Fuel, small Tbr, fodder, gum, tannin, enriches soil. Handicraft
Ailanthus Excelsa	(Aura) Maharukh	Fuel, small timber, fodder, enriches soil, shade Shade, fodder, pulp, softwood
Anacardi Occidentale	Cashew, Kaju	Gum (insecticide), ink, sand dunes Nuts, shade, fuel crating, stalkedible, oil (termites)
Azadirachta Indica	Neem	Tooth brush, oil, fuel, small timber, fodder
Buchanna Lanzan	Char Chiromsi	Seeds on dessert, soil erosion
Cassia Fistula	(AVAL), Amaltas	Purgative, insect repellent, tannin, handicraft (Hard wood)
Cleistanthus Collinus	Garari	Tannin
Dalbergia Sissoo	Sheesham Sissoo	Fuel, (Fodder) construction, hardy, fire resistant Shade, enriches soil
Dendrocalamus Strictus	Bamboo (Manuel)	Fuel, fodder, fruit, TBR, small timber, Handicraft
Emblica Officinalis	Aonla, Amla	Construction, poles, pulp, fodder, food, tools, paper pulp Tannin
Eucalyptus Tereticornis (Hybrid)	Eucalyptus	Fruit, medicine, coppices, ornamental, tools, construction Timber, fuel, poles, pulp
Gmelina Arborea	Sewan, Gumbar	Timber, poles, fuel, (construction (Teak-like))
Leucaena Leucocephala	Ipil Ipil (Phil) Koo-bahul	Fuel, fodder, small timber, pulp, gum
Pongamia Pinnata	Karanj	Oil from seed, shade, fuel, green manure
Prosopis juliflora	Ganao babul	Fuel, pods (fodder), gum, tools, sand dunes stabilization
Schlechteria Oleosa	Kosam (Kusum)	Oil (seed-soap), shade
Salmalia Malabarim	Silk cotton tree Semal	coppices, fuel Match sticks, ornamental, rough lumber, cordage floss
Tamarindus Indica	Imli	Fruit, fuel, seeds (starch), light construction
Terminalia Arjuna	Koha Arjun	Medicine, silkworm food, timber, tannin (no coppice)
Terminalia Tomentosa	Saja	Construction, fodder, silkworm food, medicine, fuel
Tectona Grandis	Teak	Timber, fuel, poles, Thatch
Zizyphus Jujuba	BER	Fuel, fodder, fruit

Total Annual Consumption of Firewood by End Use in
Madhya Pradesh (In thousand tons)

Description	Cooking		Water Heating		Space Heating		Total	
	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
Logs	2494.9	1224.4	27.3	26.4	6.7	7.5	2528.9	1258.3
Twigs	4360.8	251.6	68.7	10.3	28.7	1.8	4458.2	263.7
Wood Shavings	-	-	0.9	-	0.3	-	1.2	-
T O T A L	6855.7	1476.0	96.9	36.7	35.7	9.3	6988.3	1522.0

Average Annual Per House-hold Consumption of Firewood
in M.P. By End Use (In kgs.)

Logs	338.8	725.3	3.8	15.6	1.3	4.5	343.9	745.4
Twigs	593.4	149.0	8.1	6.1	3.9	1.1	605.4	156.2
Wood Shavings	-	-	0.2	0.1	-	-	0.2	0.1
T O T A L	932.2	874.3	39.1	21.8	5.2	5.6	949.5	901.7

Average Annual Per Capita Consumption of Firewood (In kgs.)

Logs	61.0	134.8	0.6	2.9	0.2	0.8	61.8	138.5
Twigs	106.8	27.7	1.5	1.1	0.8	0.2	109.1	29.0
Wood Shavings	-	-	-	-	-	-	-	-
T O T A L	167.8	162.5	2.1	4.0	1.0	1.0	170.9	167.5

Annual Consumption of Dung Cakes in M.P. By End Uses

Total Consumption in (000 tons)	7513.0	46.8	182.9	8.4	54.7	2.6	7750.5	57.8
Per House-hold (In kgs.)	1020.3	27.7	24.8	5.0	7.4	1.6	1052.5	34.3
Per Capita consumption (In Kg)	183.7	5.1	4.5	0.9	1.3	0.3	189.5	6.3

Annual Consumption of Crop Waste in M.P. By End Uses

Description	Cooking		Water Heating		Space Heating		Total	
	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
Total consumption in (000 tons)	1752.6	-	72.9	-	39.7	-	1865.2	-
Per Household Consumption (In kgs.)	238.0	-	9.9	-	5.4	-	253.3	-
Per Capita Consumption (In kgs.)	42.8	-	1.8	-	1.0	-	45.6	-

Annex 5.

MADHYA PRADESH SOCIAL FORESTRY PROJECT 386-0475

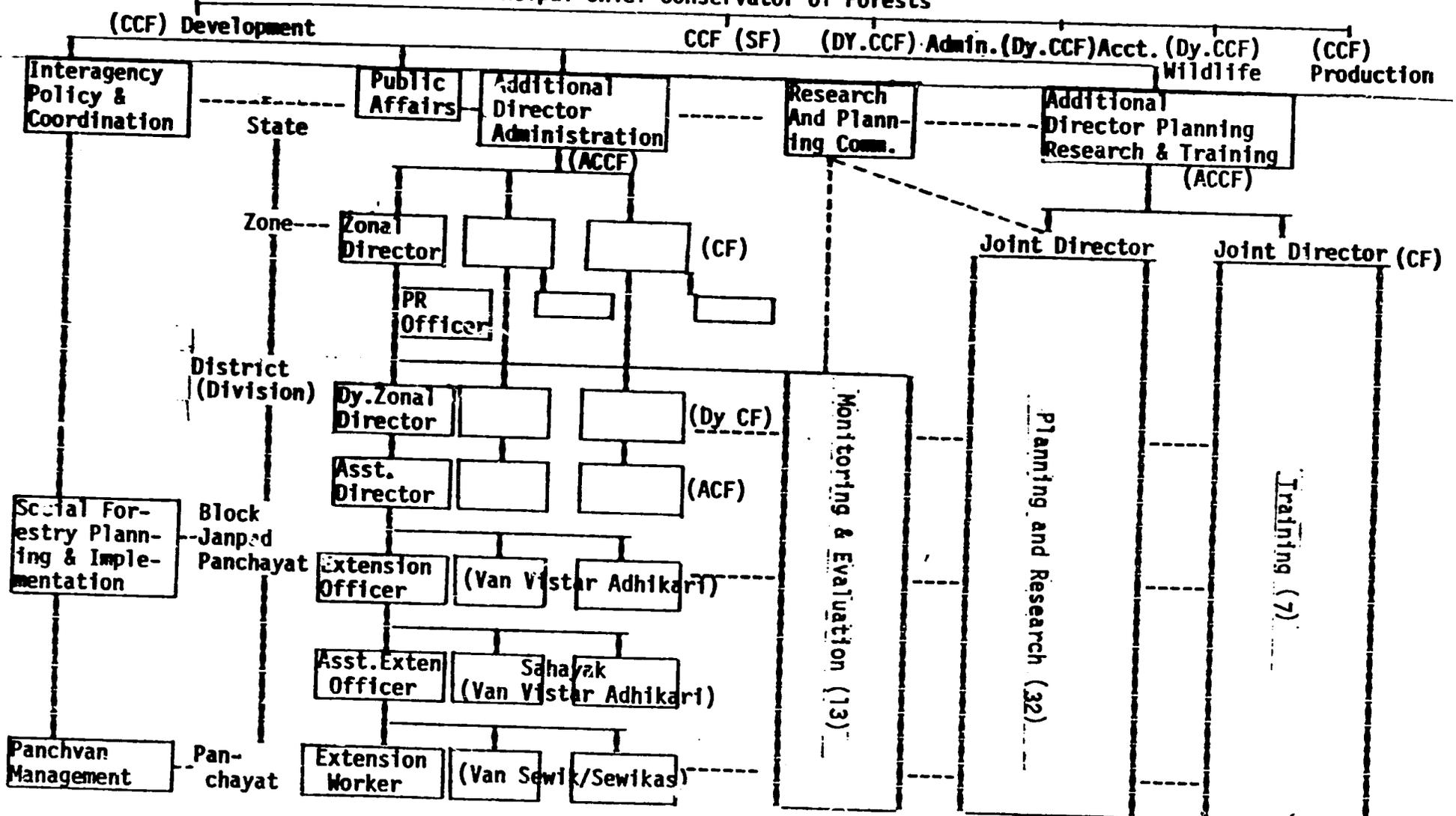
Life of Project:
From FY 82 to FY 86
Total US Funding \$25 million
Date Prepared 4/81

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions																																
<p>Goal</p> <ol style="list-style-type: none"> Increase the supply of firewood, fodder, fruit and small timbers for agricultural implements and house construction at the village level on a sustained basis. Increase rural employment. Reduce the rate of deforestation. 	<p>Measures of Goal Achievement</p> <ol style="list-style-type: none"> 6,000 villages supplied with 25 percent of current annual household needs for firewood by EOP 30 million days of employment provided in nursery production, panchvan establishment and harvesting. 63,450 ha of degraded forest and village waste land reforested. 	<p>Records of M.P. Social Forestry Directorate and Panchayat</p>	<ol style="list-style-type: none"> Extension program will gain support of villagers to extend program in self-help mode beyond EOP Labor intensive, nursery, planting and harvesting methods continue to be used. 																																
<p>Purpose:</p> <p>Create the institutional capability to assist villagers to manage communal and private lands for increased and sustained production of forest products through</p> <ol style="list-style-type: none"> establishment of forestry extension organization institutionalization of communal plantations on village common and government wasteland production and distribution of seedlings for reforestation on private land. 	<p>Conditions indicating purpose achieved at EOP.</p> <ol style="list-style-type: none"> Soc. For. Directorate fully staffed and all divisions operational. Nurseries able to supply quantity and quality of seedling on schedule. Plantations established tended, harvested and produce distributed according to panchayat agreement and extension project plans. Villagers/panchayats participating on Advisory Committees. No. of panchayats signing agreements and assuming responsibility for panchvan management increasing. Extension program and staff coordinated with other block programs. Increased amounts of village land made available for panchvan program. Demand for seedlings for private land increases. 	<p>Panchayat and Social Forestry Directorate Records.</p> <p>Report of Block Extension Programs</p>	<p>Assumptions for achieving purpose:</p> <ol style="list-style-type: none"> Motivated and qualified indigenous personnel can be recruited and trained in sufficient numbers. Current for. Department staff who have skills and experience to initiate program will be made available. A workable form of agreement between Panchayat and Social Forestry Directorate can be designed & implemented Villagers believe fuelwood, fodder and other panchvan products will accrue to them. Farmers consider planting seedlings on own land profitable. The government will not institute a cost recovery program for panchvan which would seriously impair the returns to the village. GOI support for project, both financially and administratively, remains strong. Increased availability of firewood does not encourage greater rates of household consumption. 																																
<p>Outputs</p> <ol style="list-style-type: none"> Firewood, fodder plantations (ha). Nurseries Trained extension and nursery staff Extension project plans Research and monitoring Other professionals trained 	<p>Magnitude of Outputs</p> <p>63450 (ha)</p> <p>135</p> <p>2000</p> <p>1060</p> <p>20</p>	<p>Research Reports</p> <p>Reports of monitoring and Evaluation Branch Panchayat & Directorate</p> <p>Records</p>	<ol style="list-style-type: none"> Panchayats have and are willing to commit portions of their common land to panchvan scheme. Labor is available at wages budgeted Severed climate conditions, e.g. monsoon failure, do not occur. 																																
<p>Inputs</p> <p>Financing Consultants Training</p>	<p>Implementation Targets (\$ millions)</p> <table border="1"> <thead> <tr> <th>U.S. FY</th> <th>82</th> <th>83</th> <th>84</th> <th>85</th> <th>86</th> <th>87</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>Loan</td> <td>2.3</td> <td>3.4</td> <td>4.3</td> <td>5.2</td> <td>5.8</td> <td>3.0</td> <td>24</td> </tr> <tr> <td>Grant</td> <td>.1</td> <td>.2</td> <td>.2</td> <td>.2</td> <td>.2</td> <td>.1</td> <td>1</td> </tr> <tr> <td>Total</td> <td>2.4</td> <td>3.6</td> <td>4.5</td> <td>5.4</td> <td>6.0</td> <td>3.1</td> <td>25</td> </tr> </tbody> </table>	U.S. FY	82	83	84	85	86	87	Total	Loan	2.3	3.4	4.3	5.2	5.8	3.0	24	Grant	.1	.2	.2	.2	.2	.1	1	Total	2.4	3.6	4.5	5.4	6.0	3.1	25	<p>USAID Progress and Evaluation Reports.</p>	<ol style="list-style-type: none"> Highly motivated persons with technical skills required can be recruited when needed. Qualified candidates can be placed in appropriate training programs.
U.S. FY	82	83	84	85	86	87	Total																												
Loan	2.3	3.4	4.3	5.2	5.8	3.0	24																												
Grant	.1	.2	.2	.2	.2	.1	1																												
Total	2.4	3.6	4.5	5.4	6.0	3.1	25																												



Minister Forest (Cabinet Rank)
State Minister Forest
Secretary Forest
Special Secretary

Deputy Secretary Under Secretary
 Principal Chief Conservator of Forests



MAGYTA PROVINCE SOCIAL FORESTRY PROJECT - EXPANSION PLAN

Annex 7

Year	Operating Units	Area Plan-		Staff		Total Staff	...							Lecturers/Scientists	Trg. Evalua- tion/Publi- city Off.	Support Staff		
		ted by Year (ha)	No.	Level Eq	50%		CCF	ACCF	CF	DCF	ACF	VYA	SYVA				WS	
1981-82	Headquarters (1)*	-	1	1	1		1	1	2	1	-	-	-	-	9	1	12	94
	Pilot Divisions 1-3 (1)	225	3	3	3		-	-	-	3	-	9	20	63	-	-	-	55
	Zone-wide Trials (1)	1200	120	-	-		-	-	-	-	-	-	-	-	-	-	-	-
		<u>1425</u>				271	1	1	2	3	-	9	20	63	9	1	12	149
1982-83	Headquarter (2)	-	1	1	1		1	2	4	2	-	-	-	-	18	2	25	188
	Pilot Div. 1-3 (2)	1350	3	3	3		-	-	-	3	3	18	39	126	-	-	-	111
	Regular Div. 1-11 (1)	-	11	11	11		-	-	-	6	5	33	72	231	-	-	-	203
	Pilot Div. 4 (1)	75	1	1	1		-	-	-	1	-	3	7	21	-	-	-	18
	Zone Offices (1)	-	3	-	3		-	-	2	1	-	-	-	-	-	2	-	38
		<u>1500</u>	150	-	-	1185	1	2	6	13	8	54	118	378	18	4	25	568
1983-84	Headquarters (3)	-	1	1	1		1	2	4	2	-	-	-	18	2	25	188	
	Pilot Div. 1-3 (3)	2250	3	3	3		-	-	-	3	3	18	39	126	-	-	-	111
	Pilot Div. 4 (2)	450	1	1	1		-	-	-	1	1	6	13	42	-	-	-	37
	Reg. Div. 1-11 (2)	4950	11	11	11		-	-	-	11	11	66	143	462	-	-	-	407
	Pilot Div. 5 (1)	75	1	1	1		-	-	-	1	-	3	7	21	-	-	-	18
	Reg. Div. 12-15 (1)	-	4	4	4		-	-	-	2	2	12	26	84	-	-	-	74
	Zone Offices (2)	-	4	3	1		-	-	4	3	-	-	-	-	-	3	-	88
		<u>7725</u>				2086	1	2	4	23	17	105	228	735	18	5	25	929
1984-85	Headquarters (4)	-	1	1	1		1	2	4	2	-	-	-	18	2	25	188	
	Pilot Div. 1-3 (4)	2250	3	3	3		-	-	-	3	3	18	39	126	-	-	-	111
	Pilot Div. 4 (3)	750	1	1	1		-	-	-	1	1	6	13	42	-	-	-	37
	Pilot Div. 5 (2)	450	1	1	1		-	-	-	1	1	6	13	42	-	-	-	37
	Pilot Div. 6 (1)	75	1	1	1		-	-	-	1	1	6	13	42	-	-	-	37
	Reg. Div. 1-11 (3)	8250	11	11	11		-	-	-	11	11	66	143	462	-	-	-	407
	Reg. Div. 12-15 (2)	1800	4	4	4		-	-	-	4	4	24	52	168	-	-	-	148
	Reg. Div. 16-19 (1)	-	4	4	4		-	-	-	2	2	12	26	84	-	-	-	74
	Zone Offices (3)	-	5	4	1		-	-	5	4	-	-	-	-	-	4	-	112
		<u>13575</u>				2617	1	2	9	29	22	135	293	945	18	6	25	1132
1985-86	Headquarters (5)	-	1	1	1		1	2	4	2	-	-	-	18	2	25	188	
	Pilot Div. 1-3 (5)	2250	3	3	3		-	-	-	3	3	18	39	126	-	-	-	111
	Pilot Div. 4 (4)	750	1	1	1		-	-	-	1	1	6	13	42	-	-	-	37
	Pilot Div. 5 (3)	750	1	1	1		-	-	-	1	1	6	13	42	-	-	-	37
	Pilot Div. 6 (2)	450	1	1	1		-	-	-	1	1	6	13	42	-	-	-	37
	Reg. Div. 1-11 (4)	8250	11	11	11		-	-	-	11	11	66	143	462	-	-	-	407
	Reg. Div. 12-15 (3)	3000	4	4	4		-	-	-	4	4	24	52	168	-	-	-	148
	Reg. Div. 16-19 (2)	1800	4	4	4		-	-	-	4	4	24	52	168	-	-	-	148
	Reg. Div. 20-23 (1)	-	4	4	4		-	-	-	2	2	12	26	84	-	-	-	74
	Zone Offices (4)	-	6	5	1		-	-	6	5	-	-	-	-	-	5	-	137
		<u>17250</u>				3095	1	2	10	34	27	162	351	1134	18	7	25	1324
1986-87	Headquarters (6)	-	1	1	1		1	2	4	2	-	-	-	18	2	25	188	
	Pilot Div. 103 (E)	2750	3	3	3		-	-	-	3	3	18	39	126	-	-	-	111
	Pilot Div. 4 (5)	750	1	1	1		-	-	-	1	1	6	13	42	-	-	-	37
	Pilot Div. 5 (4)	750	1	1	1		-	-	-	1	1	6	13	42	-	-	-	37
	Pilot Div. 6 (3)	750	1	1	1		-	-	-	1	1	6	13	42	-	-	-	37
	Reg. Div. 1-11 (5)	8250	11	11	11		-	-	-	11	11	66	143	462	-	-	-	407
	Reg. Div. 12-15 (4)	3000	4	4	4		-	-	-	4	4	24	52	168	-	-	-	148
	Reg. Div. 16-19 (3)	3000	4	4	4		-	-	-	4	4	24	52	168	-	-	-	148
	Reg. Div. 20-23 (2)	1800	4	4	4		-	-	-	4	4	24	52	168	-	-	-	148
	Zone Offices (5)	-	6	6	6		-	-	6	6	-	-	-	-	-	6	-	150
		<u>20550</u>				3310	1	2	10	37	29	174	377	1218	18	8	25	1471

* No. in parentheses indicate year of operation.

Cost Structure for Typical Mixed
Plantation

<u>1st Year</u>	<u>COSTS</u>		
		<u>(Rs./ha)</u>	
<u>I t e m</u>	<u>Labor</u>	<u>Non-Labor</u>	<u>Total</u>
1. Inspection, and identification of area	1	0	1
2. Layout of fencing	5	0	5
3. Cattle proof trench excavation	700	50	750
4. Staking including cost of stakes	25	10	35
5. Carriage of plants	50	-	50
6. Seedling sit excavation (30x30x30 cm)	200	25	225
7. Planting	75	-	75
8. Application of insecticide including cost of insecticide	44	40	84
9. Application of fertilizers including cost of fertilizers	40	50	90
10. Watering, weeding, hoeing etc. (2 operations)	200	-	200
11. Soil conservation measures	50	-	50
12. Sowing of babul & prosopis along the boundary of the field	50	50	100
13. Miscellaneous items	25	10	35
T o t a l	1465	235	1700
<u>2nd Year</u>	<u>Maintenance</u>		
1. Replacement of casualties	25	-	25
2. Cost and application of fertilizers	30	50	80
3. Weeding, watering, and hoeing etc.	195	-	195
T o t a l	250	50	300
<u>3rd Year</u>			
1. Weeding, hoeing & watering	200	-	200

Cost Structure for Silviculture

<u>1st Year</u>		<u>COSTS</u> (Rs./ha)		
<u>I t e m</u>	<u>Labor</u>	<u>Non-Labor</u>	<u>Total</u>	
1. Inspection and identification of area	1	0	1	
2. Layout of fencing	5	0	5	
3. Excavation of cattle proof trench (1.5mx1.0m)	700	50	750	
4. Soil working including of pits 30x30x30 cm	150	-	150	
5. Collection, storage, carriage, and sowing of seeds of improved grasses	10	-	10	
6. Planting of seedlings including transport	50	-	50	
7. Planting of tussocks of napier grass and other selected grasses	40	-	40	
8. Weeding and hoeing etc. (once)	80	-	80	
9. Miscellaneous	15	-	15	
T o t a l	1050	50	1100	
<u>2nd Year</u>		<u>Maintenance</u>		
1. Weeding, hoeing Beating up etc. (2 operations)	150	-	150	
2. Other miscellaneous operation	150	-	150	
T o t a l	300	-	300	
<u>3rd Year</u>				
1. Weeding, hoeing beating up etc.)	200	-	200	
2. Other miscellaneous operation)				

Annex 10

Nursery Production Costs

I t e m	Rs.per 1000 plants		Total Rs/1000 plants
	Labor	Non-Labor	
1. Cost of seed collection, transport upto nursery	22.00	-	22
2. Pre-treatment seeds	0.30	-	30
3. Cost of nutrient solution in germination beds	-	4.50	4.50
4. Showing in germination beds	0.30	-	.30
5. Preparation of germination beds	0.30	-	.30
6. Watering of germination beds	2.60	-	2.60
7. Pricking out in germination beds	2.70	-	2.70
8. Cost of insecticide and weedicides	-	0.10	.10
9. Cost of application of insecticides and weedicides	0.30	-	.30
10. Raising of transplant beds including soil preparation an polythene bags	13.50	-	13.50
11. Weeding in transplant beds and polythene bags	12.00	-	12.00
12. Cost of ploythene bags	-	78.75	78.75
13. Cost of filling polythene bags	12.75	-	12.75
14. Cost of transplanting of seedlings in polythene bags	12.75	-	12.75
15. Watering in polythene bags	45.00	-	45.00
16. Cost of fertilizers in polythene bags	-	7.50	7.50
17. Cost of application of fertilizers	0.50	-	.50
18. Preparation of polythene bags for transportation including material	12.00	3.00	15.00
19. Miscellaneous	13.00	6.15	19.15
T o t a l	150.00	100.00	250
or say	150.00	100.00	250

Assumptions - One ha nursery = 500 beds
 1 Bed = 600 seedlings
 Total seedlings = 300000 in One ha-Nursery

ENGINEERING ANALYSIS

1. General Description

The engineering and construction phase for AID financing includes for 29 districts construction of different types of buildings with necessary facilities for water supply, septic tank for sewer disposal and provision for electric supply where necessary. The proposed construction represents a continuation of the State Ministry of Forestry efforts to provide an infrastructure for its staff near project sites for the delivery of services under the Project.

2. Site Selection

The simple and uniform design of structures will not require any special or unusual site characteristics. All sites provided will be free of cost and with easy accessibility. These sites will also be free of flooding and will have natural drainage. Provision for future expansion will also be made. The Forestry Department is in a process of selecting the sites based on these criteria.

3. General Design Aspects and Specifications

The State Forestry Department has developed standard plans for most of the buildings to maximize the use of men and material resources which are locally available at the project sites, and to suit the aesthetic and functional requirements (including withstanding moderate to heavy rains) of the buildings. The buildings proposed are similar to the existing buildings in the project areas and are in unison with the surrounding environment. The structural design of the buildings are simple, the construction requiring minimal use of engineering skills. The roofs are slanting and its top provided with locally manufactured tiles. The wooden trusses and purlins, supported by columns and beams, constitutes the roof structure. The walls are generally non-load bearing. The dead load of the roof and nominal live load of about

20 pounds square ft. of these structures (which is much lower than for similar structures having flat roofs in RCC) is borne by the columns and transferred to the foundation. The lateral stability of the structure is provided by inter-connecting the columns with the beams.

The specifications proposed are:

- a. Foundation in boulder and murrum, gutti and murrum watered and rammed under brick work, and 1:4:8 cement concrete under the pillars.
- b. Pillars, beams, lintels in reinforced cement concrete 1:2:4.
- c. Masonry work up to plinth level in mud mortar for smaller buildings, and in cement mortar 1:6 medium and big size buildings.
- d. Damp proof course in cement concrete 1:2:4 with bitumen layer at top where required.
- e. Superstructure in second class brick masonry with mud mortar or cement mortar 1:6 depending on the design requirement.
- f. Plaster work inside and outside in cement mortar 1:6 to 1:8.
- g. Flooring in stone slabs laid with cement mortar 1:6 or 1:8 or cement concrete 1:2:4 depending on the design requirement.
- h. (i) Wood work for doors and window frames and joineries in Bija/teak/sal wood, and shutters in sal/teak.
(ii) Wooden trusses of the adopted design with purlins and ballies in teak/Bijal/sal wood, and roof (slanting) in locally manufactured roof tiles/ACC corrugated sheets.

4. Construction and Project Management

The Forestry Department prepares construction work plans and rough cost estimates for the buildings for approval by the State Government. After the work plans and cost estimates are approved, the State Government releases funds. Thereafter, each Divisional Forest Office (DFO) prepares detailed plans and cost estimates and obtains from the Forestry Department technical approval to start construction.

Once the building schemes are sanctioned, the DFO calculates the quantities of building materials required based on available plans. Quotations are invited for the purchase of the building materials from the local market. The quotations are evaluated and lowest responsive bidder is awarded the contract.

Construction is carried out by the Forestry Department by hiring skilled and unskilled labor on daily wages or under force account. Construction supervision is carried out by the DFO who is assisted by the Range Officers and Foresters. The Range Officers provide full-time construction supervision. Measurements for the different construction stages such as foundation, plinth, roof levels etc are checked and certified by a senior official of the rank of Assistant Conservator of Forest and above. The range officer maintains records for the measurements. The designs for the buildings are simple and traditional and, therefore, special engineering skills for construction and construction supervision are not required. In addition, the Forestry Department has several years of experience in project management for implementation of the construction.

USAID intends to rely mostly on the experience and proven capability of State Forestry Department for its monitoring functions. However, field visits to several randomly selected on-going schemes will be made by USAID representatives to ensure that the various project elements are being implemented in accordance with agreed design and specifications. Such visits will be undertaken several

times a year by the USAID/Delhi Indian engineer, who is familiar with the technical requirements, and other components for the building construction activities under this project. This engineer will also be responsible for reviewing requests for reimbursement for project construction elements and for making final recommendations for construction reimbursements.

5. Cost Estimates

The State Forestry Department is responsible for the preparation of cost estimates. Calculations are based on the standard plans and the existing site conditions. Thereafter, the cost estimates are finalized by using the current local market prices for materials and labor. To this, a lump sum amount is added for water supply and sewerage disposal for all buildings, and for electric supply where required. Further, an escalation of 30% is added for a construction period of 6 years. This figure is considered adequate, as the use of simple designs, low-cost building materials, local skilled and unskilled labor are taken into consideration. For detailed cost estimates see Appendix I attached.

6. Conclusion

The engineering and construction phase of the project will be implemented in accordance with the long established and accepted standards and practices followed by the Forestry Department. Design and cost estimates proposed by the Forestry Department have been reviewed by USAID and have been found simple and adequate. Cost estimates are reasonable. Detailed drawings and specifications would be provided by the State Forestry Department to USAID for its review and approval, prior to undertaking any construction activity under this project.

COST ESTIMATES FOR CONSTRUCTION

COST IN (000'Rs.)

No.	Description	Total Units	Unit Cost* (Rs.)	Estimated Yearly Expenditure (000'Rs.)						T o t a l
				1981-82	1982-83	1983-84	1984-85	1985-86	1986-87	
1.	Deputy Conservator Forest Offices	29	150	225	1,125	1,275	750	675	300	4,350
2.	Deputy Conservator Forest Quarters	29	100	150	750	850	500	450	200	2,900
3.	Assistant Conservator Forest Quarters	29	70	105	525	595	350	315	140	2,030
4.	Van Vistar Adhikari Quarters	174	35	315	1,575	1,785	1,050	945	420	6,090
5.	Van Vistar Sahayak Quarters	377	20	390	1,950	2,210	1,300	1,170	520	7,540
6.	Van Sewak Quarters	1218	10	630	3,150	3,570	2,100	1,890	840	12,180
				1,815	9,075	10,285	6,050	5,445	2,420	35,090

Total Cost of Construction Rs.35,090,000

Add inflation of 30% for

6 years Rs.10,530,000

Grand Total Rs.45,620,000

*Base early 1981 estimate

or \$ 5,702,500

PROJECT BUDGET AT A GLANCE - SOCIAL FORESTRY - MADHYA PRADESH

Sl No.	Item Description	(Rs. '000)						Sub total	Inflation (5 years)	Total	
		1981-82*	1982-83	1983-84	1984-85	1985-86	1986-87			Rs.(000)	\$Million
1.	Staff	1,727	6,779	10,963	14,180	16,647	17,756	68,052	10,887	78,939	9.87
2.	Operations	1,175	4,150	5,600	6,700	7,650	7,850	33,125	5,300	38,425	4.80
3.	Nurseries	1,525	4,050	7,038	8,937	10,637	10,637	42,824	6,850	49,674	6.21
4.	Plantations	3,983	7,337	14,223	25,854	34,782	42,633	128,812	20,210	149,022	18.63
	i. Establishment	(3,983)	(6,910)	(13,060)	(22,952)	(29,164)	(34,743)	(110,812)	(17,330)	(128,142)	(16.02)
	ii. Maintenance	(-)	(427)	(1,163)	(2,902)	(5,618)	(7,890)	(18,000)	(2,880)	(20,880)	(2.61)
5.	Training	500	960	800	800	600	500	4,160	-	4,160	0.52
	i. Overseas	(100)	(400)	(400)	(400)	(200)	(100)	(1,600)	-	(1,600)	(0.20)
	ii. India	(400)	(560)	(400)	(400)	(400)	(400)	(2,560)	-	(2,560)	(0.32)
6.	Grants & Consultancy	500	800	900	900	500	240	3,840	-	3,840	0.48
	i. US Consultants	(300)	(400)	(300)	(300)	(200)	(100)	(1,600)	-	(1,600)	(0.20)
	ii. Grants to Indian Organization(s)	(200)	(400)	(600)	(600)	(300)	(140)	(2,240)	-	(2,240)	(0.28)
7.	Equipment	2,900	9,475	3,725	3,225	2,625	-	21,950	3,520	25,470	3.18
8.	Buildings	1,815	9,075	10,285	6,050	5,445	2,420	35,090	10,530	45,620	5.70
9.	Remodelling of Training & Research Institutes	-	2,400	2,450	-	-	-	4,850	-	4,850	0.61
Total		14,125	45,026	55,984	66,646	78,886	82,036	342,703	57,297	400,000	\$50 million

* GOI Fiscal Year April 1 - March 31

Annex 12
Table 2

Schedule Showing Costs by Major Functions
and Sub-Functions

Type of Expenditure	Rs. (000)	\$ (000)	Percent of Total
STAFF	78,939	9,868	20%
Headquarters	12,465		
Administration, Public Affairs, Monitoring & Evaluation	6,800		
Research & Education	5,665		
Zones	5,284		
Administration & Public Affairs	5,284		
Divisions	61,190		
Administration, Planning (add'l) & Extension	61,190		
OPERATIONS	38,425	4,802	10%
Headquarters	9,251		
Administration	3,828		
Public Affairs	319		
Research & Training	5,104		
Zones	2,784		
Divisions	26,390		
Administration & Extn.	24,708		
Planning	1,682		
NURSERIES	49,674	6,210	13%
Establishment, Operations & Maintenance	47,922		
Free distribution of seedlings to farmers	1,752		
PLANTATIONS	149,022	18,628	37%
Establishment	128,142		
Maintenance	20,880		
TRAINING	4,160	520	1%
GRANTS & CONSULTANCY	3,840	480	1%
EQUIPMENT	25,470	3,184	6%
BUILDINGS	45,620	5,702	11%
REMODELLING OF TRAINING & RESEARCH INSTITUTIONS	4,850	606	1%
T O T A L	400,000	50,000	

SUMMARY COST ESTIMATES AND FINANCIAL PLAN
(U.S. \$ 000)

Sl. No.	Source	Loan LC	AID		Total	GOI		Total	Total	%age financed by AID
			Grant LC	FX		LC	FX			
1.	Staff	4,934	-	-	4,934	4,934	-	9,868	9,868	50%
2.	Operations	2,401	-	-	2,401	2,401	-	4,802	4,802	50%
3.	Nurseryes	3,105	-	-	3,105	3,105	-	6,210	6,210	50%
4.	Plantations	9,314	-	-	9,314	9,314	-	18,628	18,628	50%
	i. Establishment	(8,009)	-	-	(8,009)	(8,009)	-	(16,018)	(16,018)	
	ii. Maintenance	(1,305)	-	-	(1,305)	(1,305)	-	(2,610)	(2,610)	
5.	Training	-	320	200	520	-	200	320	520	100%
	i. Overseas	-	-	(200)	(200)	-	(200)	-	(200)	
	ii. India	-	(320)	-	(320)	-	-	(320)	(320)	
6.	Grants & Consultancy	-	280	200	480	-	200	280	480	100%
	i. U.S. Consultants	-	-	(200)	(200)	-	(200)	-	(200)	
	ii. Indian Consultants & Grants to Indian Organization(s)	-	(280)	-	(280)	-	-	(280)	(280)	
7.	Equipment	1,592	-	-	1,592	1,592	-	3,184	3,184	50%
8.	Buildings	2,654	-	-	2,654	3,048	-	5,702	5,702	47%
9.	Remodelling of Training and Research Institutes	-	-	-	-	606	-	606	606	-
		24,000	600	400	25,000	25,000	400	49,600	50,000	50%

Rate of Exchange - Rs.8.00 = \$1.00

Note: Financial Plan estimates inclusive of inflation factors. 16% for items 1,2,3,4 & 7 and 30% for item 8

Equipment List*

<u>Item</u>	<u>Cost</u>
<u>Headquarters Unit</u> (1)	\$(000)
1 Vehicles, 16 @ \$9400	150.4
2 Office equipment (furniture, typewriters, copiers, duplicators, calculators, etc.)	124.6
	<u>\$ 275.0</u>
<u>Research Unit</u> (1)	
1 Vehicles, 3 @ \$9400	28.2
2 Office equipment (furniture, typewriters, etc.)	15.8
3 Laboratory equipment (furniture, scientific instruments, etc.)	48.5
	<u>\$ 92.5</u>
<u>Training Unit</u> (1)	
1 Vehicles 2 @ 9400	18.8
2 Office equipment (furniture, typewriters, calculators, duplicators)	8.2
3 Instructional equipment (furniture, audio visual)	15.5
	<u>\$ 32.5</u>
<u>FIELD OFFICES</u> (<u>29</u> DIVISIONS)	
1 Vehicles, 58 @ \$9400	545.0
2 Farm type tractor & trailer, 87 @ \$8750	761.0
3 Motorcycles, 174 @ \$1900	330.0
4 Office equipment (typewriters, calculators, Duplicators, furniture, etc.) 29 lots @ \$18,600/lot	539.0
	<u>\$2175.0</u>

* No vehicles, Motorcycles or tractors will be purchased with AID funds.

Table 4

FIELD OFFICES (6 ZONES)

1	Vehicles 12 @ \$9400	112.8
2	Office equipment (typewriters, calculators, furniture, etc.) 6 lots @ 9375/lot	<u>56.2</u> \$169.0

Equipment Cost Summary

	(\$000)
Headquarters	275
Research	92.5
Training	32.5
Division	2175.0
Zones	<u>169.0</u>
Subtotal	2744.0
<u>Inflation</u>	<u>436.0</u>
Total	\$3180.0 = budgeted cost

Estimated
Equipment Expenditure by Year (\$000)

81-82	362.5
82-83	1184.3
83-84	465.6
84-85	404.2
85-86	328.1
86-87	nil
	<u>\$2743.7</u>

PROJECT BUDGET AT A GLANCE - SOCIAL FORESTRY - MADHYA PRADESH

(In '000 Rs.)

Sl. No.	1981 - 82		1982 - 83		1983 - 84		1984 - 85		1985 - 86		1986 - 87		T O T A L		Grand Total
	AID	GOI	AID	GOI	AID	GOI	AID	GOI	AID	GOI	AID	GOI	AID	GOI	
1. Staff	1,641	86	7,204	801	11,008	1,942	10,247	6,503	7,863	11,795	3,145	17,823	41,108	38,950	80,058
2. Operations	1,116	59	4,410	490	5,620	993	4,830	3,082	3,614	5,420	1,391	7,879	20,981	17,923	38,904
3. Nurseries	756	769	2,372	2,411	4,125	4,186	5,235	5,319	6,230	6,331	6,230	6,331	24,948	25,347	50,295
4. Plantations:	1,976	2,007	4,504	4,160	8,817	7,979	15,540	14,991	19,753	21,321	21,747	28,598	72,337	79,056	151,393
i) Establishment	1,976	2,007	4,050	4,110	7,649	7,773	13,450	13,654	17,100	17,340	20,350	20,678	64,575	65,562	130,137
ii) Maintenance	-	-	454	50	1,168	206	2,090	1,337	2,653	3,981	1,397	7,920	7,762	13,494	21,256
5. Training	500	-	960	-	800	-	800	-	600	-	500	-	4,160	-	4,160
i) Overseas	100	-	400	-	400	-	400	-	200	-	100	-	1,600	-	1,600
ii) India	400	-	560	-	400	-	400	-	400	-	400	-	2,560	-	2,560
6. Grants & Consultancy:	500	-	800	-	900	-	900	-	500	-	240	-	3,840	-	3,840
i) US Consultants	300	-	400	-	300	-	300	-	200	-	100	-	1,600	-	1,600
ii) Grants to Indian Organization(s)	200	-	400	-	600	-	600	-	300	-	140	-	2,240	-	2,240
7. Equipment	1,438	1,462	5,550	5,639	2,182	2,218	1,890	1,918	1,550	1,550	-	-	12,610	12,787	25,397
8. Buildings	900	915	5,316	5,401	5,951	6,195	3,545	3,600	3,200	3,230	1,104	1,746	20,016	21,087	41,103
9. Remodelling of Training & Res. Institutes	-	-	-	2,400	-	2,450	-	-	-	-	-	-	-	4,850	4,850
T O T A L	8,827	5,298	31,116	21,302	39,403	25,963	42,987	35,413	43,310	49,647	34,357	62,377	200,000	200,000	400,000

Note:

The data from 1982-83 onward includes an 18% inflation factor.

Madhya Pradesh Social Forestry Project ..
Initial Environmental Examination

Project Location : India

Project Title : Madhya Pradesh Social Forestry

Life of Project : 5 years, FY 81 commencement

Funding : LOP: \$25.0 million

I.E.E. Prepared by : Jane E. Stanley, ASIA/TR/STEP

Environmental Action Required : Negative Determination

Mission Concurrence : Priscilla M. Boughton
Priscilla M. Boughton
Director, USAID/India
Date April 9, 1980

Assistant Administrator Decision : Approved [Signature]
Disapproved _____
Date 6/27/80

INITIAL ENVIRONMENTAL EXAMINATION

Madhya Pradesh Social Forestry

I. Project Description

The purpose of this project is to increase the supply of fuelwood, small timber, fodder, and other forest products in the rural areas of Madhya Pradesh, India.

The project's principal activity will be the establishment and maintenance of community tree plantations and improved grasslands in deficit districts. Using the approximately 2 million hectares available for this purpose, the project will establish mixed fuelwood, fodder, small timber and bamboo plantations on village wasteland unsuited for cropping, on degraded government forest lands, and along roads, canals, and railways. It is currently estimated that approximately 115,000 hectares of tree plantations will be established by year 5 of the project and an additional 50,000 hectares of improved grasslands will be developed. These plantations will be established with the full participation of local villages and panchayats, and wherever possible, be turned over to them for on-going maintenance and distribution of benefits.

Supplementing the establishment of community forest and fodder resources, the project will also encourage the establishment of private farm forestry through extension, demonstration, and the free distribution of tree seedlings and grass seeds. By the fifth year of the project it is estimated that over 2 million seedlings will have been distributed and over 400 demonstration plots established. In addition, it is expected that the project will also promote the adaptation and dissemination of improved household fuelwood stoves and, possibly, biogas units.

In order to carry out these activities, the project will also include (a) survey, mapping, site assessment and the formulation of management plans for the plantations and grasslands improvements on village lands and degraded forests, (b) establishment of departmental and community nurseries (including school and private nurseries) to meet increased seedling requirements, (c) extension and information services to support farm forestry and the management of community forest and grazing areas, (d) provision of small timber, bamboo, pole, and fuelwood supplies to the rural population while plantations are maturing, (e) research, evaluation and monitoring activities and (f) strengthening of the social forestry unit through provision of additional staff, training, and the establishment of forestry extension training capabilities.

II. Evaluation of Impacts

All the project's activities are designed to identify and correct existing environmental degradation. The only project activity which does have a potential for creating adverse effects on the environment is the establishment of forest plantations. Large forest plantations can adversely affect the hydrological balance of an area and decrease water supply for downstream users.

However, in this project the average size of individual plantations will range from 15 to 25 hectares. In some degraded forest areas individual plantings may range up to 75 hectares. Because the size of individual plantations will be small, no adverse hydrological consequences are anticipated.

III. Conclusion and Recommendations

The project is designed to create many positive environmental impacts and no adverse impacts are anticipated to result from project activities. USAID/India therefore recommends the project be given a Negative Determination.

INDIA - MADHYA PRADESH SOCIAL FORESTRY
CERTIFICATION PURSUANT TO SECTION 611 (e)
OF THE FOREIGN ASSISTANCE ACT OF 1961,
AS AMENDED

I, Priscilla M. Boughton, Principal Officer of the Agency for International Development in India, having taken into account among other things the maintenance and utilization of projects in India previously financed or assisted by the U. S. and the commitment and resources of the Government of India applied to Social Forestry, do hereby certify that in my judgment India has the financial and human resources capability to implement, maintain and effectively utilize the assistance proposed for India's Madhya Pradesh Social Forestry program.


Priscilla M. Boughton
Priscilla M. Boughton
Mission Director
USAID/India

Date July 2, 1981

386-0-21

ANNEX 15

AUG 24 4 18 PM '81

EXECUTIVE SECRETARIAT

18 AUG 1981

ACTION MEMORANDUM FOR THE ADMINISTRATOR

THRU: ES

THRU: A/AA/PPC, Mr. Larry Smucker

FROM: AA/ASIA, Jon B. Holstine

Problem: You are requested to authorize the Madhya Pradesh Social Forestry Project (386-0475) for India involving planned obligations of \$24 million in loan funds and \$1 million in grant funds over a three year period beginning in FY 1981. The Project Paper is attached (Tab 2).

Background: The economy of India as a whole, and particularly that of its rural areas, is heavily dependent on forests and forest products for domestic fuel. Household consumption of fuelwood is estimated at 95 million tons, representing about 50 percent of rural household energy consumption and 37 percent of urban energy use. Forest resources are being depleted by a growing population. As a result, the amount of time per rural family devoted to fuelwood collection is increasing. The reduction of forests impacts adversely on agricultural productivity because it leads to soil erosion, altered surface and ground water supplies, and shortages of livestock forage.

In India, social forestry, i.e., village participation in forest protection, afforestation and the planned use of forest resources, historically has not been a part of overall forest management. Government forestry programs which had social or community goals have failed due to lack of public understanding and involvement. Moreover, the process for diffusing innovations was ineffective. Beginning in the late 1970s, corrective programs were initiated in each of the major states of India. These new programs recognize that the villagers themselves can increase the local production of forest products and protect vital forest resources. To assist the villager in this role, new state government institutions have been established. Through technical assistance and the provision of material, these institutions will transfer suitable forest management technologies to the villager.

0127872

Such a social forestry program was established by the State of Madhya Pradesh in 1976. Its development was assisted by a Ford Foundation-supported pilot project begun in 1978. The results of that pilot project and an intensive review of the forestry sector in Madhya Pradesh by AID indicate that the deforestation of village common lands and adjoining government lands near villages can be reversed. It was concluded that a forestry extension program where the state government's expertise in reforestation can be coupled with a village-based self-help program is both economically and socially feasible.

Discussion: This project will create the capacity in the Government of Madhya Pradesh to mount a large-scale, effective social forestry program. During the life of the project specific technical solutions to reforestation at the village level will be developed and disseminated, and approximately 5,000 villages in 29 districts will be helped to increase their fuel, fodder and forest products supply and their agricultural productivity. A new management system will be created, embodied in the Social Forestry Directorate. This will provide extension, training and logistical support at the district and local levels. The Directorate's staff will increase dramatically during the life of the project as training and program development proceed. At the conclusion of the project, a fully operational organization with a trained, experienced staff of 3,300, a network of fully-stocked nurseries, and a vigorous research program will be ready to expand the social forestry program in the state.

The loan portion of this project will finance local costs related to establishment and maintenance of plantations and nurseries, and a portion of staff, operations and facilities costs. The innovative nature of the project calls for technical assistance in the design and implementation of research and training programs and for in-country and overseas training. These will be financed by the grant.

This project requires rapid institutional development concurrent, during its life, with establishment of new state-village relationships, changed behavior in the rural economy, and significant investment in support structure. Careful attention has therefore been given to the project's implementation and the steps and controls necessary to assure success. Detailed planning by the Social Forestry Directorate of its training and research programs and its monitoring and evaluation functions are prior conditions to disbursement of AID funds or scheduled to occur before stipulated deadlines. Obligation of the third tranche of the loan, in FY 83, will take place only after the first full evaluation, a central feature of which will be an assessment of village participation.

A Congressional Notification for this project expired on August 7, 1981. There are no outstanding Congressional queries or audit recommendations. No waivers are requested.

Recommendation: That you approve this project, a \$24 million loan and \$1 million grant, by signing the attached Project Authorization (Tab 1).

Attachments:

1. Project Authorization
2. Project Paper

Clearances:

AAA/PPC/PDPR:JEriksson Andy Date 8-19-81
GC:JHBolton KCK for Date 8-19-81

ASIA/PD/SA:JOsborn:fv:8/13/81:X58450

UNITED STATES INTERNATIONAL DEVELOPMENT COOPERATION AGENCY
AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D.C. 20523

PROJECT AUTHORIZATION

INDIA

Madhya Pradesh
Social Forestry
Project No. 386-0475
Loan No. 386-T-230

1. Pursuant to Section 103 of the Foreign Assistance Act of 1961, as amended, I hereby authorize the Madhya Pradesh Social Forestry Project (the "Project") for India (the "Cooperating Country") involving planned obligations of not to exceed Twenty-Four Million United States Dollars (\$24,000,000) in loan funds and One Million United States Dollars (\$1,000,000) in grant funds over a three year period from date of authorization, subject to the availability of funds in accordance with the A.I.D. OYB/allotment process, to help in financing foreign exchange and local currency costs for the Project.

2. The Project will assist the Cooperating Country in the establishment and operation of a Social Forestry Directorate in the State of Madhya Pradesh to support villages in managing communal and private lands for increasing the supply of fuelwood, fodder, small timber and other forest products. Loan funds will finance staff and operating costs, extension, goods and equipment, services including construction, and the establishment and maintenance of nurseries and plantations. Grant funds will finance training in the Cooperating Country, the United States and designated third countries, required technical assistance, and research and studies.

3. The Project Agreement which may be negotiated and executed by the officer to whom such authority is delegated in accordance with A.I.D. regulations and Delegations of Authority shall be subject to the following essential terms and covenants and major conditions, together with such other terms and conditions as A.I.D. may deem appropriate.

4. a. Interest Rate and Terms of Repayment

The Cooperating Country shall repay the Loan to A.I.D. in United States Dollars within forty (40) years from the date of first disbursement of the Loan, including a grace

period of not to exceed ten (10) years. The Cooperating Country shall pay A.I.D. in United States Dollars interest from the date of first disbursement of the Loan at the rate of (a) two percent (2%) per annum during the first ten (10) years, and (b) three percent (3%) per annum thereafter, on the outstanding disbursed balance of the Loan and on any due and unpaid interest accrued thereon.

b. Source and Origin of Goods and Services

With the exception of ocean shipping, goods and services financed by A.I.D. under the Project shall have their source and origin in the Cooperating Country or (in the case of grant funds) the United States or (in the case of loan funds) in countries included in A.I.D. Geographic Code 941, except as A.I.D. may otherwise agree in writing. Ocean shipping financed by A.I.D. under the Loan shall be on flag vessels of the Cooperating Country or any country included in A.I.D. Geographic Code 941, and under the Grant shall be on flag vessels of the United States, except as A.I.D. may otherwise agree in writing.

c. Conditions Precedent to Disbursement

The Project Agreement shall contain conditions precedent providing in substance, except as A.I.D. may otherwise agree in writing, as follows:

1. Prior to the first disbursement of any funds under the Project, or to the issuance by A.I.D. of documentation pursuant to which disbursement will be made, the Cooperating Country will furnish to A.I.D. in form and substance satisfactory to A.I.D.:

- (A) evidence of the establishment and initial staffing of a Social Forestry Directorate, together with a statement of its scope, organizational structure and duties;
- (B) evidence of the establishment of a State Interdepartmental Policy Committee, its constitution and a statement of its procedures and functions.

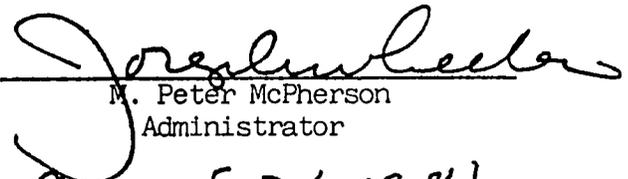
2. Prior to the disbursement of loan funds for individual construction activities under this Project, or to the issuance of documentation by A.I.D. pursuant to which such disbursement will be made, the Cooperating Country shall furnish to A.I.D. in form and substance satisfactory to A.I.D., detailed drawings and specifications for all types of buildings to be constructed.

3. Prior to the first disbursement of loan funds for establishment of forestry plantations with participating panchayats under the Project, or to the issuance by A.I.D. of documentation pursuant to which such disbursement will be made, the Cooperating Country shall furnish to A.I.D., in form and substance satisfactory to A.I.D., a description of the content of the management plan that will be used for such plantations, including the social and legal arrangements that will be established with participating panchayats.

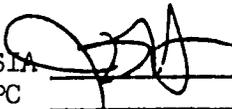
d. Covenants

The Project Agreement shall contain covenants providing in substance that the Cooperating Country shall, except as A.I.D. may otherwise agree in writing:

- (1) establish a monitoring and evaluation unit within the Social Forestry Directorate by June 1982 that is fully staffed by October 1982;
- (2) establish for the Project a planning and research unit by February 1982 that is fully staffed by March 1982 and develop a research plan satisfactory to A.I.D. by May 1982;
- (3) develop a training plan satisfactory to A.I.D. by June 1982;
- (4) submit to A.I.D. sample agreements and guidelines governing legal and other relations between the Madhya Pradesh Forestry Department and panchayats by October 1982.

Signature 
 M. Peter McPherson
 Administrator
 Date August 26, 1981

Clearances:

Jon D. Holstine, AA/ASIA	<u></u>	Date	<u>8/18/81</u>
Larry Smucker, A/AA/PPC	<u>LS</u>	Date	<u>8/24/81</u>
John R. Bolton, GC	<u>JRB for</u>	Date	<u>8-19-81</u>

SRT

A. I. D. Loan No.

Project No. 386-0475

Project Description

The goal of this project is to increase the supply of fuelwood, fodder, small timber, and other forest products on lands adjacent to rural villages in Madhya Pradesh (M. P.) to benefit the inhabitants of these villages. The project will provide the institutional capability to assist such villages to manage communal and private land for sustained production of these forest products. This will be accomplished through the establishment of a Social Forestry Directorate within the M. P. Forest Department with full responsibility for the development of this program. Under the direction of the Directorate and in agreement with local panchayats, mixed plantations will be established adjacent to the villages with some plantings also along road, rail and canal sides; seedlings to increase forest production on private land will also be provided. The major aspects of the Social Forestry Directorate program will include:

(a) an extension program for planning and coordination, providing information, motivation, training and operational demonstrations at the district and local levels;

(b) an implementation program supplying logistical support for the extension program in the form of seed and seedling production and plantation establishment;

(c) an information and problem solving network consisting of (i) an advisory committee system to present needs and problems from the viewpoint of local government and cooperating state agencies and function as a problem solving forum for considering legal, political, social and other related issues encountered by the Directorate, (ii) a technical monitoring and evaluation branch providing information on program accomplishments and problems in both social sciences and forestry operations, and (iii) a research program to address problems of an applied nature in both social sciences and forestry; and

(d) an administrative program to give program direction and coordination to the overall social forestry efforts and direct a substantial program for formal education and in-service training.

The Social Forestry Directorate will be headed by a Director of Social Forestry with the rank of a Chief Conservator of Forests (CCF). Under the CCF will be two Additional CCFs (ACCF), one for administration and one for planning, training and research. The

ACCF for administration has basic responsibility for the extension and reforestation program along with monitoring. The second ACCF is responsible for support programs. The overall staff of the Directorate will consist of about 3300 employees including 80 gazetted officers, 30 research personnel, 1800 extension personnel and 1390 subprofessional support personnel.

The project will be expanded over a six year period. The first two years will be used to build and train an extension organization, initiate research and establish pilot plantations and extension programs in 15 districts of the state. In the final 4 years the program will be extended to 14 additional districts.

AID will provide 50% of financing of the overall project activities. The major components included for financing are staff, operations, nurseries, plantations, scholarships, grants and consultancies, equipment and buildings. The share of AID financing for each of these items is shown in Attachment A to this Annex.

In addition to the establishment of the Social Forestry Directorate, the major outputs of the project will be seedlings for planting on private land and mixed plantations, supplying fuelwood, fodder, small timber and fruit and other minor products planted on government and community lands. It is anticipated that during the life of the project,

these mixed plantations will be planted on approximately 63,450 hectares of marginal or degraded land adjacent to villages. The project is expected to supply 25 percent of the current annual firewood needs in 5,000 villages in addition to other products coming from these plantations. The project should have a significant impact on rural employment, both during the development stage in the establishment of these plantations or "panchvans" and in the continued maintenance and harvesting of such schemes when they are fully developed. It is estimated that 30 million person days of employment will be provided during the project life.

Since women are major gatherers and users of forest products, it is expected that women will have an important role in project implementation. Employment opportunities will be created in the development of panchvans where women have traditionally provided labor for such things as digging pits, trenches and hauling water. There will be an increasing opportunity to employ women in nursery operations as well as to serve as extension officers and extension workers. Qualified women will be actively recruited for these positions including tribal women for those panchvan programs in tribal areas as appropriate.

AID will provide \$1 million of grant financing primarily to support scholarships, training grants, consultancies, and research and studies envisioned under the program. It is contemplated that required technical assistance will be provided through contracts with one or more U. S. organizations and counterpart Indian institutions. Training will consist of both in-country training, short and long term courses in the United States, and training in designated third countries.

Since the relationships and cooperation between panchayats and the Forestry Department will be critical to project success, an agreement between these two institutions based on a management plan is considered important in establishing roles and responsibilities of each. While flexibility is necessary to reflect the preferences of various panchayats and varying administrative and fiscal situations under which a panchvan will be established, in general these agreements should address the following:

- (1) Land to be used for the panchvan and species to be planted.
- (2) Responsibility for establishment, maintenance and protection of the panchvan.

(3) Training to be provided by the Social Forestry Directorate for the villagers.

(4) Conditions for panchvan expansion.

(5) A mechanism for making management decisions.

The panchvan schemes are in essence to be developed for the benefit of the panchayat and with panchayat participation. It is also anticipated that at some point the panchayat will take over full responsibility for these plantations. Thus, the agreement should further indicate how the reimbursement of funds allocated by the Directorate for panchvan establishment and protection will be made to the panchayat; specify the steps which the panchayat would need to accomplish prior to full control of the panchvan schemes being vested in the panchayats; and define the method of distributing production from the panchvan within the panchayat.

Since the objective of the program is to provide increased forest production, primarily on revenue and forest lands traditionally used by villagers for the benefit of the village, then the full production obtained from such panchvans should accrue to the panchayat involved. Consequently, the government will not seek to recover costs for

the establishment of these panchvans but permit the full production to accrue to the benefit of the panchayat.

The Social Forestry Directorate will provide a continuous monitoring and evaluation service as part of its program. This service will encompass both the social and forestry aspects of the project. Two major project reviews by AID are planned during the six year implementation life. In the spring of 1983 a review will be conducted of progress made in training, monitoring and evaluation and research programs and address any remedial action. The second review will be scheduled for the spring of 1985 to assess overall project accomplishments and determine the desirability and timing for a follow-on project of AID assistance.

AID intends to make \$25 million available in increments to support the \$50 million project. This will include \$24 million in loan financing with the remaining \$1 million in grant financing for purposes outlined in the attached financial plan. Of this amount,

is being provided for in this project agreement with the remaining amount to be added in subsequent fiscal years subject to the availability of funds for the above purpose and the mutual agreement of the parties at the time of a subsequent increment to proceed.

Attachment 'A'

A.I.D. Loan No.

Project No.

PROJECT FINANCIAL PLAN
(in \$ 000)

Project Components	Cum.Obligation/ Commitments as of August 1981		Future Year anticipated		T o t a l	
	GOI	AID	GOI	AID	GOI	AID
Staff	617	617	4,317	4,317	4,934	4,934
Operations	300	300	2,101	2,101	2,401	2,401
Nurseries	388	388	2,717	2,717	3,105	3,105
Plantations	1,164	1,164	8,150	8,150	9,314	9,314
Scholarships	-	520	-	-	-	520
Grants and Consultancies	-	480	-	-	-	480
Equipment	199	199	1,393	1,393	1,592	1,592
Buildings	332	332	2,716	2,322	3,048	2,654
Remodelling of Train- ing and Research Institutes	-	-	606	-	606	-
TOTAL	3,000	4,000	22,000	21,000	25,000	25,000

5C(1) - COUNTRY CHECKLIST

Listed below are, first, statutory criteria applicable generally to FAA funds, and then criteria applicable to individual fund sources: Development Assistance and Economic Support Fund.

A. GENERAL CRITERIA FOR COUNTRY ELIGIBILITY

- | | |
|--|-----|
| 1. <u>FAA Sec. 116</u> . Can it be demonstrated that contemplated assistance will directly benefit the needy? If not, has the Department of State determined that this government has engaged in a consistent pattern of gross violations of internationally recognized human rights? | Yes |
| 2. <u>FAA Sec. 481</u> . Has it been determined that the government of recipient country has failed to take adequate steps to prevent narcotics drugs and other controlled substances (as defined by the Comprehensive Drug Abuse Prevention and Control Act of 1970) produced or processed, in whole or in part, in such country, or transported through such country, from being sold illegally within the jurisdiction of such country to U.S. Government personnel or their dependents, or from entering the United States unlawfully? | No |
| 3. <u>FAA Sec. 620(b)</u> . If assistance is to a government, has the Secretary of State determined that it is not controlled by the international Communist movement? | Yes |
| 4. <u>FAA Sec. 620(c)</u> . If assistance is to government, is the government liable as debtor or unconditional guarantor on any debt to a U.S. citizen for goods or services furnished or ordered where (a) such citizen has exhausted available legal remedies and (b) debt is not denied or contested by such government? | No |
| 5. <u>FAA Sec. 620(e)(1)</u> . If assistance is to a government, has it (including government agencies or subdivisions) taken any action which has the effect of nationalizing, expropriating, or otherwise seizing ownership or control of property of U.S. citizens or entities beneficially owned by them without taking steps to discharge its obligations toward such citizens or entities? | No |

A.

6. FAA Sec. 620(a), 620(f); FY 79 App. Act, Sec. 108, 114 and 606. Is recipient country a Communist country? Will assistance be provided to the Socialist Republic of Vietnam, Cambodia, Laos, Cuba, Uganda, Mozambique, or Angola?

No. No assistance will be provided to these countries.

7. FAA Sec. 620(i). Is recipient country in any way involved in (a) subversion of, or military aggression against, the United States or any country receiving U.S. assistance, or (b) the planning of such subversion or aggression?

AID is not aware of any such involvement.

8. FAA Sec. 620 (j). Has the country permitted, or failed to take adequate measures to prevent, the damage or destruction, by mob action, of U.S. property?

No.

9. FAA Sec. 620(l). If the country has failed to institute the investment guaranty program for the specific risks of expropriation, inconvertibility or confiscation, has the AID Administrator within the past year considered denying assistance to such government for this reason?

No.

10. FAA Sec. 620(o); Fishermen's Protective Act of 1967, as amended, Sec. 5. If country has seized, or imposed any penalty or sanction against, any U.S. fishing activities in international waters:

No such actions have been taken against U.S. fishing activities in international waters.

a. has any deduction required by the Fishermen's Protective Act been made?

b. has complete denial of assistance been considered by AID Administrator?

11. FAA Sec. 620; FY 79 App. Act, Sec. 603.

(a) Is the government of the recipient country in default for more than 6 months on interest or principal of any AID loan to the country?
(b) Is country in default exceeding one year on interest or principal on U.S. loan under program for which App. Act appropriates funds?

No.

12. FAA Sec. 620(s). If contemplated assistance is development loan or from Economic Support Fund, has the Administrator taken into account the percentage of the country's budget which is for military expenditures, the amount of foreign exchange spent on military equipment and the

Yes. India spends a relatively small amount of its foreign exchange on military equipment. Latest available figures are an estimated \$300 million military imports or 4% of \$7.5 billion in total foreign exchange in FY 80. India proposes to spend only 16% of its Central Government budget on defense in U.S. FY 80-81. India's military purchases include a variety of modern weapon systems bought primarily from the U.K. and France.

A.12.

amount spent for the purchase of sophisticated weapons systems? (An affirmative answer may refer to the record of the annual "Taking Into Consideration" memo: "Yes, as reported in annual report on implementation of Sec. 620(s)." This report is prepared at time of approval by the Administrator of the Operational Year Budget and can be the basis for an affirmative answer during the fiscal year unless significant changes in circumstances occur.)

13. FAA Sec. 620(t). Has the country severed diplomatic relations with the United States? If so, have they been resumed and have new bilateral assistance agreements been negotiated and entered into since such resumption?

No.

14. FAA Sec. 620(u). What is the payment status of the country's U.N. obligations? If the country is in arrears, were such arrearages taken into account by the AID Administrator in determining the current AID Operational Year Budget?

India is not in arrears regarding its U.N. obligations.

15. FAA Sec. 620A, FY 79 App. Act, Sec. 607. Has the country granted sanctuary from prosecution to any individual or group which has committed an act of international terrorism?

No.

16. FAA Sec. 666. Does the country object, on basis of race, religion, national origin or sex, to the presence of any officer or employee of the U.S. there to carry out economic development program under FAA?

No.

17. FAA Sec. 669, 670. Has the country, after August 3, 1977, delivered or received nuclear enrichment or reprocessing equipment, materials, or technology, without specified arrangements or safeguards? Has it detonated a nuclear device after August 3, 1977, although not a "nuclear-weapon State" under the nonproliferation treaty?

No.

B. FUNDING CRITERIA FOR COUNTRY ELIGIBILITY

1. Development Assistance Country Criteria

a. FAA Sec. 102(b)(4). Have criteria been established and taken into account to assess commitment progress of country in effectively involving the poor in development, on such indexes as: (1) increase in agricultural productivity through small-farm labor intensive agriculture, (2) reduced infant mortality, (3) control of population growth, (4) equality of income distribution, (5) reduction of unemployment, and (6) increased literacy?

Yes. These criteria are based on India's Five Year Development Plan (1978-83).

B.1.

FAA Sec. 304(d)(1). If appropriate, is this development (including Sahel) activity designed to build motivation for smaller families through modification of economic and social conditions supportive of the desire for large families in programs such as education in and out of school, nutrition, disease control, maternal and child health services, agricultural production, rural development, and assistance to urban poor?

Not applicable.

2. Economic Support Fund Country Criteria

a. FAA Sec. 502B. Has the country engaged in a consistent pattern of gross violations of internationally recognized human rights?

Not applicable.

b. FAA Sec. 533(b). Will assistance under the Southern Africa program be provided to Mozambique, Angola, Tanzania, or Zambia? If so, has President determined (and reported to the Congress) that such assistance will further U.S. foreign policy interests?

Not applicable.

c. FAA Sec. 609. If commodities are to be granted so that sale proceeds will accrue to the recipient country, have Special Account (counterpart) arrangements been made?

Not applicable.

d. FY 79 App. Act, Sec. 113. Will assistance be provided for the purpose of aiding directly the efforts of the government of such country to repress the legitimate rights of the population of such country contrary to the Universal Declaration of Human Rights?

Not applicable.

e. FAA Sec. 620B. Will security supporting assistance be furnished to Argentina after September 30, 1976?

Not applicable.

5C(2) - PROJECT CHECKLIST

Listed below are statutory criteria applicable generally to projects with FAA funds and project criteria applicable to individual fund sources: Development Assistance (with a subcategory for criteria applicable only to loans); and Economic Support Fund.

CROSS REFERENCES: IS COUNTRY CHECKLIST UP TO DATE?
HAS STANDARD ITEM CHECKLIST BEEN REVIEWED FOR THIS PRODUCT?

A. GENERAL CRITERIA FOR PROJECT

1. FY 79 App. Act Unnumbered; FAA Sec. 653 (b); Sec. 634A. (a) Describe how Committees on Appropriations of Senate and House have been or will be notified concerning the project; (b) is assistance within (Operational Year Budget) country or international organization allocation reported to Congress (or not more than \$1 million over that figure)?
(a) Formal notification will be given to Congressional Committees.
(b) Yes, in country OYB
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 reasonably firm estimate of the cost to the U.S. of the assistance?
Yes.
3. FAA Sec. 611(a)(2). If further legislative action is required within recipient country, what is basis for reasonable expectation that such action will be completed in time to permit orderly accomplishment of purpose of the assistance?
None needed.
4. FAA Sec. 611(b); FY 79 App. Act Sec. 101. If for water or water-related land resource construction, has project met the standards and criteria as per the Principles and Standards for Planning Water and Related Land Resources dated October 25, 1973?
Not applicable.
5. FAA Sec. 611(e). If project is capital assistance (e.g., construction), and all U.S. assistance for it will exceed \$1 million, has Mission Director certified and Regional Assistant Administrator taken into consideration the country's capability effectively to maintain and utilize the project?
Yes
6. FAA Sec. 209. Is project susceptible of execution as part of regional or multilateral project? If so why is project not so executed? Information and conclusion whether assistance will encourage regional development programs.
No

A.

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.

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

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.

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

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

12. FY 79 App. Act Sec. 608. If assistance is for the production of any commodity for export, is the commodity likely to be in surplus on world markets at the time the resulting productive capacity becomes operative, and is such assistance likely to cause substantial injury to U.S. producers of the same, similar, or competing commodity?

B. FUNDING CRITERIA FOR PROJECT

1. Development Assistance Project Criteria

a. FAA Sec. 102(b); 111; 113; 281a. 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

Project is not directly applicable to foreign trade. Also it is not directed to labor unions.

The project is not expected to directly foster U.S. private trade and investment abroad.

The country is contributing sufficient amount of local currency for contractual and other services. (See item 10 for U.S. owned currencies.)

The U.S. owns Indian rupees that are being used for various U.S.G agencies' program and administrative support and these rupees are expected to be liquidated for current on-going activities over the next 7 years.

Yes

Not applicable

+

The project is expected to supply 15% of the current annual firewood needs in 15,000 villages. Mixed plantations supplying firewood fodder, small timber and fruit will be planted on 67,500 ha of degraded land. The project activities are labor intensive and would generate rural employment. Women in rural areas are expected to benefit significantly in terms of employment and reduced time spent by women in collecting fuelwood.

D.1.a.

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?

b. FAA Sec. 103, 103A, 104, 105, 106, 107.
Is assistance being made available: (include only applicable paragraph which corresponds to source of funds used. If more than one fund source is used for project, include relevant paragraph for each fund source.)

(1) [103] for agriculture, rural development or nutrition; if so, extent to which activity is specifically designed to increase productivity and income of rural poor; [103A] if for agricultural research, is full account taken of needs of small farmers;

(2) [104] for population planning under sec. 104(b) or health under sec. 104(c); if so, extent to which activity emphasizes low-cost, integrated delivery systems for health, nutrition and family planning for the poorest people, with particular attention to the needs of mothers and young children, using paramedical and auxiliary medical personnel, clinics and health posts, commercial distribution systems and other modes of community research.

(3) [105] for education, public administration, or human resources development; if so, extent to which activity strengthens nonformal education, makes formal education more relevant, especially for rural families and urban poor, or strengthens management capability of institutions enabling the poor to participate in development;

(4) [106] for technical assistance, energy, research, reconstruction, and selected development problems; if so, extent activity is:

(i) technical cooperation and development, especially with U.S. private and voluntary, or regional and international development, organizations;

(ii) to help alleviate energy problems;

(iii) research into, and evaluation of, economic development processes and techniques;

(iv) reconstruction after natural or manmade disaster;

The project is designed to increase supply of energy to rural villages for heating and cooking on a sustainable basis.

B.1.b.(4),

(v) for special development problem, and to enable proper utilization of earlier U.S. infrastructure, etc., assistance;

(vi) for programs of urban development, especially small labor-intensive enterprises, marketing systems, and financial or other institutions to help urban poor participate in economic and social development.

c. [107] Is appropriate effort placed on use of appropriate technology?

d. FAA Sec. 110(a). Will the recipient country provide at least 25% of the costs of the program, project, or activity with respect to which the assistance is to be furnished (or has the latter cost-sharing requirement been waived for a "relatively least-developed" country)?

e. FAA Sec. 110(b). Will grant capital assistance be disbursed for project over more than 3 years? If so, has justification satisfactory to the Congress been made, and efforts for other financing, or is the recipient country "relatively least developed"?

f. FAA Sec. 281(b). Describe extent to which program recognizes the particular needs, desires, and capacities of the people 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-government.

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

2. Development Assistance Project Criteria (Loans Only)

a. FAA Sec. 122(b). Information and conclusion on capacity of the country to repay the loan, including reasonableness of repayment prospects.

b. FAA Sec. 620(d). If assistance is for any productive enterprise which will compete in the U.S. with U.S. enterprise, is there an agreement by the recipient country to prevent export to the U.S. of more than 20% of the enterprise's annual production during the life of the loan?

The GOI is contributing 50% of the total project cost.

Not applicable.

Besides addressing the concern of deforestation the project provides a means for addressing (a) accelerated agricultural production and rural employment and (b) stabilization of rural energy (firewood) problem. The project will establish a management system for sustained communal fuelwood and fodder production utilizing both village and government common lands.

Yes

India's foreign exchange earnings continue to grow. AID loan will establish plantations and provide seedlings to increase fuelwood production which will contribute to loan repayment.

Not applicable.

B.

3. Project Criteria Solely for Economic Support Fund

a. FAA Sec. 531(a). Will this assistance support promote economic or political stability? To the extent possible, does it reflect the policy directions of section 102?

Not applicable.

b. FAA Sec. 533. Will assistance under this chapter be used for military, or paramilitary activities?

Not applicable.

5C(3) - STANDARD ITEM CHECKLIST

Listed below are statutory items which normally will be covered routinely in those provisions of an assistance agreement dealing with its implementation, or covered in the agreement by imposing limits on certain uses of funds.

These items are arranged under the general headings of (A) Procurement, (B) Construction, and (C) Other Restrictions.

A. Procurement

1. FAA Sec. 602. Are there arrangements to permit U.S. small business to participate equitably in the furnishing of goods and services financed? Yes

2. FAA Sec. 604(a). Will all commodity procurement financed be from the U.S. except as otherwise determined by the President or under delegation from him? Yes, from the U.S. - unless otherwise determined.

3. FAA Sec. 604(d). If the cooperating country discriminates against U.S. marine insurance companies, will agreement require that marine insurance be placed in the United States on commodities financed? Yes

4. FAA Sec. 604(e). If offshore procurement of agricultural commodity or product is to be financed, is there provision against such procurement when the domestic price of such commodity is less than parity? Not applicable.

5. FAA Sec. 603(a). Will U.S. Government excess personal property be utilized wherever practicable in lieu of the procurement of new items? Yes

6. FAA Sec. 603. (a) Compliance with requirement in section 901(b) of the Merchant Marine Act of 1936, as amended, that at least 50 per centum of the gross tonnage of commodities (computed separately for dry bulk carriers, dry cargo liners, and tankers) financed shall be transported on privately owned U.S.-flag commercial vessels to the extent that such vessels are available at fair and reasonable rates. Yes

7. FAA Sec. 621. If technical assistance is financed, will such assistance be furnished to the fullest extent practicable as goods and professional and other services from private enterprise on a contract basis? If the Yes

A.7.

facilities of other Federal agencies will be utilized, are they particularly suitable, not competitive with private enterprise, and made available without undue interference with domestic programs?

Yes

8. International Air Transport. Fair Competitive Practices Act, 1974. If air transportation of persons or property is financed on grant basis, will provision be made that U.S.-flag carriers will be utilized to the extent such service is available?

Yes

9. FY 79 App. Act Sec. 105. Does the contract for procurement contain a provision authorizing the termination of such contract for the convenience of the United States?

Not applicable

B. Construction

1. FAA Sec. 601(d). If a capital (e.g., construction) project, are engineering and professional services of U.S. firms and their affiliates to be used to the maximum extent consistent with the national interest?

Construction contractors will be qualified, private Indian firms or individuals.

2. FAA Sec. 611(c). If contracts for construction are to be financed, will they be let on a competitive basis to maximum extent practicable?

Yes

3. FAA Sec. 620(k). If for construction of productive enterprise, will aggregate value of assistance to be furnished by the United States not exceed \$100 million?

Not applicable

C. Other Restrictions

1. FAA Sec. 122 (e). If development loan, is interest rate at least 2% per annum during grace period and at least 3% per annum thereafter?

Yes

2. FAA Sec. 301(d). If fund is established solely by U.S. contributions and administered by an international organization, does Comptroller General have audit rights?

Yes

3. FAA Sec. 620(h). Do arrangements preclude promoting or assisting the foreign aid projects or activities of Communist-bloc countries, contrary to the best interests of the United States?

Yes

4. FAA Sec. 636(i). Is financing not permitted to be used, without waiver, for purchase, long-term lease, or exchange of motor vehicle manufactured outside the United States, or guaranty of such transaction?

Such is not permitted

C.

5. Will arrangements preclude use of financing:

a. FAA Sec. 104(f). To pay for performance of abortions or to motivate or coerce persons to practice abortions, to pay for performance of involuntary sterilization, or to coerce or provide financial incentive to any person to undergo sterilization? **Yes**

b. FAA Sec. 620(g). To compensate owners for expropriated nationalized property? **Yes**

c. FAA Sec. 660. To finance police training or other law enforcement assistance, except for narcotics programs? **Yes**

d. FAA Sec. 662. For CIA activities? **Yes**

e. FY 79 App. Act Sec. 104. To pay pensions, etc., for military personnel? **Yes**

f. FY 79 App. Act Sec. 106. To pay U.N. assessments? **Yes**

g. FY 79 App. Act Sec. 107. To carry out provisions of FAA sections 209(d) and 251(h)? (Transfer of FAA funds to multilateral organizations for lending.) **Yes**

h. FY 79 App. Act Sec. 112. To finance the export of nuclear equipment, fuel, or technology or to train Foreign nations in nuclear fields? **Yes**

i. FY 79 App. Act Sec. 601. To be used for publicity on propaganda purposes within United States not authorized by the Congress? **Yes**

UNCLASSIFIED
Department of State

INCOMING
TELEGRAM

Annex..

PAGE 01 NEW DE 18364 301055Z 0176 091213 AID2481
ACTION AID-35

ACTION OFFICE ASH1-02
INFO ~~AID-01~~ ASH1 01 RELO-01 TELE-01 MAST-01 /009 AS 1230

INFO OCT-01 /036 W
-----272070 301057Z /13

O 301058Z SEP 81
FM AMEMBASSY NEW DELHI
TO SECSTATE WASHDC IMMEDIATE 2760

UNCLAS NEW DELHI 18364

AIDAC
E.O. 12065: N/A
SUBJECT: MADHYA PRADESH SOCIAL FORESTRY (386-0475) -
GOI LETTER REQUEST

FOLLOWING IS EXACT TEXT OF GOI LETTER REQUEST FOR
ASSISTANCE FOR MADHYA PRADESH SOCIAL FORESTRY PROJECT:

"SEPTEMBER 30, 1981

DEAR MR. WESTLEY:

- THE GOVERNMENT OF INDIA HEREBY REQUEST A LOAN OF
DOLLARS 3 MILLION AND A GRANT OF DOLLARS 1 MILLION
TO ASSIST IN FINANCING THE MADHYA PRADESH SOCIAL
FORESTRY PROJECT. THESE FUNDS ALONG WITH FURTHER US
ASSISTANCE OF DOLLARS 21 MILLION AS WELL AS THE
GOVERNMENT OF MADHYA PRADESH'S CONTRIBUTION IN THE
AMOUNT OF DOLLARS 25 MILLION WILL FINANCE THE COST OF
IMPLEMENTING THE PROJECT OVER A PERIOD OF ABOUT SIX
YEARS.

- WE WOULD APPRECIATE YOUR EARLIEST CONSIDERATION
OF THIS REQUEST FOR ASSISTANCE.

YOURS SINCERELY,
SIGNED (PURSHOTTAM LAL)"
CREEKMUR

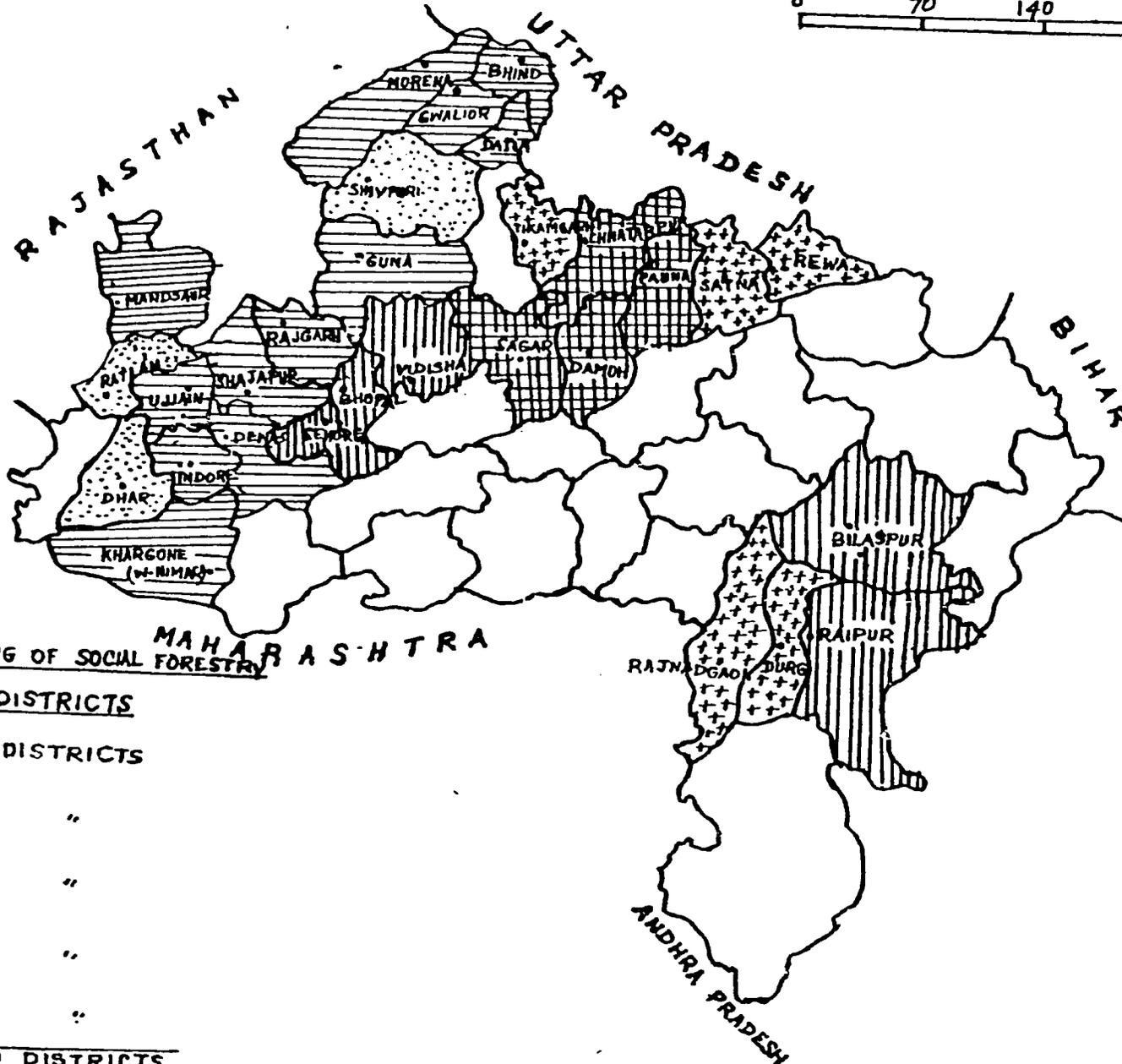
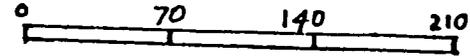
UNCLASSIFIED

MADHYA PRADESH SOCIAL FORESTRY

YEARWISE PHASING OF S.F. PROJECTS BY DISTRICTS

<u>YEAR</u>	<u>PILOT DIVISION</u>	<u>REGULAR DIVISION</u>
I	1. RATLAM 2. DHAR 3. SHIVPURI	
II	1. RAJGARH	1. Ujjain 2. Shajapur 3. Mandsaur 4. Deras 5. Indore 6. Khargone 7. Gwalior 8. Bhind 9. Datia 10. Morena 11. Guna
III	1. BILASPUR	1. Bhopal 2. Sehore 3. Vidisha 4. Raipur
IV	1. REWA	1. Durg 2. Rajnadaon 3. Tikamgarh 4. Satna
V		1. Panna 2. Sagar 3. Chhatarpur 4. Damoh

MADHYA PRADESH



PROPOSED PHASING OF SOCIAL FORESTRY

PROJECT BY DISTRICTS

YEAR-1		3	DISTRICTS
YEAR-2		12	"
YEAR-3		5	"
YEAR-4		5	"
YEAR-5		4	"

TOTAL - 29 DISTRICTS

YEARWISE PROJECT PHASING