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Report
of
THE FORESTRY PRIVATE SECTOR STUDY

September 28 - November 27, 1986

Henry Kernan

W. L. Bender

Bal Ram Bhatt

United States Agency for International
Development
Mission to Nepal

Kathmandu, Nepal

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Executive Summary

Grassland, brushlands and forest lands cover 60 percent of Nepal's 14,748,000 hectares. Dense forest with at least 50 percent crown coverage amounts to 29 percent. Since 12.6 percent of Nepal is in the High Himalayas, therefore the forest is more concentrated than the percentages suggest.

Nepal is a steep country with abundant rainfall falling mostly during the three summer months. The vegetation cover and especially the tree cover, have an important beneficial influence in controlling the overland flow of water by moderating the quantity and speed.

The numbers of ruminant livestock equal the human population of 16.5 million. Seventy percent of the animals' feed comes from the forest in the widest sense, that is the spontaneous growth of grass, brush and tree-leaf fodder. Ruminants are the principal means of maintaining the fertility of the croplands and providing draught-power and dairy products.

Wood is Nepal's most important source of energy, 85 percent of the total. Over 93 percent of wood used is used for domestic energy and amounts to 16.5 million cubic meters a year. Adding industrial and miscellaneous uses, the total comes to 17.8 million cubic meters a year of removals. The foregoing figures are the consultants' estimates and are not official.

The figure is not an excessive production for the forest of the areas indicated to support. Nevertheless because of heavy grazing and poor management generally, about half the annual removals are now drawdowns on the capital growing stock while the remainder is increment.

All open uncultivated land is nominally under the control of the Department of Forests within the Ministry of Forests and Soil Conservation. The exceptions are the National Parks, Wildlife and Hunting Reserves also in the same Ministry. They number 11 and include just over one million hectares. The Ministry has three parastatal organization concerned with marketing forest products and two with research and marketing of medicinal plants. Other activities of the Ministry are soil conservation and afforestation.

The Forest Department has five regional, 75 district offices, and 6000 employees.

The rate of conversion of tree-covered land to cropland is thought to be 2.6 percent a year applied to 5.6 million hectares (1). The Master Plan Draft states that the reforested and protected areas are increasing by 25,000 hectares a year and the deforested area by 50,000. The loss comes about both by conversion of forest to cropland and by thinning of crown cover within the forested area.

Rapid forest deterioration dates from 1957 when the Forest Department took legal control over all forest. Not having the needed personnel and funding, the Department has been unable to prevent over-use by a rural population, which had lost the traditional sense of responsibility for the maintenance of forest land.

The number of donor-supported projects with forestry objectives wholly, or in part, is about 20. They operate principally by supporting and cooperating with local government units (panchayats) with tree seedling nurseries and planting trees on public lands. They also support research, education, and planning. A number of private voluntary organizations also support forestry.

The general thought among both the donors and the forestry officials is that forestry efforts are not keeping up with the decline in forest area, volume and quality. They are looking both for greatly increased investments and for radical reforms to reverse the deterioration noted.

The consultants suggest reforms along the following lines:

- Recognition of private forests and a mechanism whereby private entities take responsibility for forest land.
- Concentration of the Forest Department's responsibilities upon specific areas to be termed national forests, upon research, and upon cooperation with local and private forestry.
- Declaration that forest lands, in the widest sense and including grasslands, brushlands and treelands which are not private, parks or national forest, are the property of the panchayats, wards and/or user groups within whose boundaries they fall.
- In reforestation more attention directed at planting on private farmlands for soil improvement, fodder and firewood, fruit and extracts.
- Abolition, sale, transfer or restructuring of the parastatals now attached to the Ministry as appropriate.
- Provision for a secure and expanding supply of materials for industrial processing through lease agreements or land acquisition by wood-using industries, contractual agreements with the private land owners to grow wood as a crop, and a Reforestation Fund to be supported by assessments on such industries.
- Privatization of tree seedling nurseries.
- More planting along roadways and water-ways.

I. ANALYSIS OF CURRENT FOREST SITUATION

A. NEPAL'S FOREST RESOURCES

According to the LAND RESOURCES MAPPING PROJECT (LRMP) there are 5.6 million hectares of forested land out of a total land mass of 14.7 million hectares. That is, about 38% of the land is forested. Forested land, as defined by LRMP, is land that has a minimum forest crown cover of 10%. We feel this 10% is too low. FAO, for example, uses a 20% crown closure lower limit in defining a forest. This 10%, tends to exaggerate the forest area.

(i) Forest Coverage

The forested land can be broken down into the following elevation categories:

Table I

	(000) ha	%
High Himalayas	160	3
High Mountains	1,630	29
Mid Mountains	1,790	32
Siwaliks	1,440	26
Terai	590	10
	5,620	100

*rounded to nearest 1,000 hectares.

(ii) Firewood needs

Forests at all elevations are used by the local population for their basic fuelwood needs. Fuelwood is the biggest component of use. Estimates revolve around one cubic meter per capita per year or 16.5 million M3 annually. LRMP has estimated that 75% of the fuelwood comes from forest and shrub lands or 11.25 million M3(1). The remainder comes principally from trees scattered over private land.

*Tables I-V adapted from tables 9,22,23 and Appendix V of LRMP report "Land Use In Nepal - A summary of Land Resources Mapping Projects Results", March 1986.

We consider that there are actually two streams of wood flow in Nepal. One, rural people (94% of the population) use the forest as a source of fuelwood, fodder and timber (wood for housing and other construction needs). The last has been estimated by the same source at 0.4M³/capita or 6 million M³/year. The consultants believe that the figure of 1.08M³ per capita per year coincides more closely with their other sources of information. This makes a total of 17.8 million M³ for fuelwood, timber and miscellaneous users.

(iii) Industrial Wood

The other wood stream is the much smaller industrial. Most of the industrial wood comes from the nearly 600,000 hectares of natural hardwood forest in the Terai (which contains over 10% of the total forested land in Nepal). It is estimated that this wood flow is now running at 5.5 - 8.3 million Hft³/year (200,000 - 300,000 M³/year) and basically supplies 6% of the mostly urban population's (mostly urban), industrial and commercial needs for wood.

(iv) Commercial forests of Tarai

We do not consider the hill forests in the other elevations as accessible commercial scale forests except the chir pine forests which are cupped for the extraction of resin.

To present a picture of the Terai natural forest, the following tables* show where they are (in which Development Region), what age groups, and what stocking conditions. They do not portray the quality of the forests.

	FWDR	MWDR	WDR	CDR	EDR	TOTAL
ha	194.0	124.0	81	125	68	592
(%)	(33)	(21)	(14)	(21)	(11)	100

TABLE III. TERAI HARDWOOD FOREST BY DENSITY CLASS
(000ha)

% CROWN COVER	FWDR	MWDR	WDR	CDR	EDR	Total
10-40=ha	8	15	13	5	3	44
%	(4)	(12)	(16)	(4)	(5)	
40-70=ha	101	58	61	81	31	332
%	(52)	(47)	(75)	(65)	(46)	
70-100=ha	85	51	7	39	33	215
%	(44)	(41)	(9)	(31)	(49)	

TABLE IV. TERAI HARDWOOD FOREST BY AGE CLASS
(000ha)

	FWDR	MWDR	WDR	CDR	EDR	Total
Regeneration ha	4	4	2	0	1	11
%	(2)	(3)	(2)	(0)	(2)	
Immature ha	56	43	49	39	12	199
(%)	(29)	(35)	(61)	(31)	(17)	
Mature ha	134	77	30	86	55	382
%	(69)	(62)	(37)	(69)	(81)	

Mature - Majority of trees have reached at least estimated rotation age or sawn timber size.

Immature - Majority of trees have not reached rotation age or small sawn timber size.

Regeneration - Majority of trees young regeneration to pole size.

TABLE V. TERAI HARDWOOD FOREST BY MAJOR TIMBER TYPES
(000ha)

TIMBER TYPE	FWDR	MWDR	WDR	CDR	EDR	TOTAL
Khair-sisso	17	10	3	1	1	43
SAL	11	49	39	66	39	307
TROPICAL MIXED HARDWOODS(TMh)	63	66	36	45	26	236
TOTAL	91	125	78	123	66	586

* Slight difference from Table 1 because minor forest types are excluded.

In Section III we discuss our ideas and recommendations for making a last ditch stand to set aside the best Terai forest for National Forests so that the Forest Department can start practicing forest management for timber production and other uses instead of trying to protect forests with floating boundaries.

(V) Present Utilization and Management of Public and Private Forest in Nepal

There are virtually no tree-covered private forests in Nepal. All of the forests were nationalized in the Private Forest Nationalization Act of 1957. Since 1957, the majority of these forests have come under the jurisdiction of the Ministry of Forest and Soil Conservation (MF&SC). Practically none of the forests is being effectively managed by the Forest Department. Some are being "mined", some given away to settlers and the majority ignored. Most of the forests are being overused, a minority protected. The MF&SC has carried on a policy of forest liquidation in the Terai through their Department of Resettlement and The Nepal Resettlement Company.

Softwoods (conifers) are not commercially available on the market because of Forest Department restrictions. Also consumer preference is for hardwoods. The Forest Department staff has only volume figures from the inventory made over 20 years ago. Since then a large area of forest land has been turned over to the resettlement of hill people in the Terai. Settlers have continued to encroach on the peripheries of the forest, girdling the trees, planting crops in the forest and rapidly shrinking the forest area. The non-industrial forests are intensely used by the rural population for fuelwood, fodder and building construction general farm use, and the collection of herbs, medicinal plants, tannin and grasses.

The Terai forests supply wood for lumber, veneer, plywood, flooring, furniture, matches and fuel besides oils, resin, medicinal plants and herbs.

The estimates of Nepal's forest resources mention but do not quantify the very large volume of wood in trees scattered over the private farmlands. They are doubly important because they are accessible for immediate use and reflect the farmers' preferences and needs for wood products. Again the estimates mention but do not elaborate upon the very large areas, perhaps 2.95 million hectares of cultivated land and noncultivated inclusions (LRMP figs.) which are in private ownership but not at present under trees. They represent a very important area for developing new sources of forest products.

The two most important influences upon the forest are those of the rural people and the administrative and legal structure of the Ministry of Forests and Soil Conservation.

The rural people use the forest as a source of firewood and of feed for their livestock either as free-range grazing or as fodder collected for stalled animals. Because the forest lands are largely national property, the local people do not take responsibility for their protection from over-use. Consequently the quality of the wood and forage resource is deteriorating.

The Forest Department within the Ministry of of Forests and Soil Conservation has legal responsibility to control the cutting of trees on all lands and the transport of wood and other forest products therefrom. With 6000 employees the Department cannot control the cutting and transport of 17.8 million cubic meters a year by 3.2 million rural families spread over the 12 million hectares below the tree line. In attempting such detailed control the Forest Department faces an impossible task. The situation encourages disrespect for the law and distracts from the Department's ability to manage forest land. Its personnel is now principally concerned with law enforcement and revenue collection rather than with protecting and renewing.

B. FOREST PRODUCTS PARASTATALS

There are six HMG autonomous organizations involved in the forest products field, 5 under the Ministry of Forests and Soil Conservation and one (Bhrikuti Paper Mills Ltd. BPM) under the Ministry of Industry. Some of these institutions are Companies, some Corporations and some development boards. The reasons for these variations are not very clear. These institutions have been discussed in detail in appendix VI.

<u>Name</u>	<u>Established</u>	<u>Authorized Shares</u>
1. Timber Corporation of Nepal Ltd. (TCN)	1960	10 Million
2. Fuelwood Corporation (FWC)	1965	Not Available
3. Royal Drugs Co. Ltd. (RDC)	1972	Not Available
4. Forest Products Development Board (FPDB)	1976	Not a Corp.
5. Herbs Production and Processing Co. Ltd. (HPPC)	1978	38.6 Million
6. Bhrikuti Paper Mills Ltd. (BPM)	1982	Not Available

The people are very much dependent on firewood to meet their energy needs and on timber and posts for building and construction purposes. The supply of timber and firewood was handled by the private sector before these corporations came into existence.

The first corporation to come was TCN followed up by FWC and FPDB. These organizations have been working for quite some time but there are certain inherent and fundamental points which go against the smooth and business-like functioning of these institutions. For example, the feeling of ownership of the institution cannot be with employees and the people who run it. Delayed decision-making, no sense of urgency, a tendency to neglect duties, avoid taking responsibilities, lack of initiative, over staffing and many times right men not on the right jobs. With the monopoly rights, and the fact that demand is always much higher than supply, there is no competition and thus no need for improvement. The result is that the objectives are not being fulfilled, and the organizations are not running efficiently. There are financial losses, material losses, production losses; supplies are scarce, people are not served well and there are complaints from many sides.

About five years ago HMG decided to merge the three tree-based institutions TCN, FWC and FPDB but it has not taken place until now. The main reasons for not complying put forward are that the three of these organizations are of three different natures legally, one a public limited company formed under Companies Act, another Corporation under Corporations Act and the other one a development board under Development boards Act. However in reality it does not seem an insurmountable hurdle because whatever they are, they all are Government organizations fully owned and run by the Government, and they can be merged any time the decision makers earnestly want to do so. This is not being done for reasons best known to them inspite of the Cabinet decision to merge them into one.

(i) TIMBER CORPORATION OF NEPAL - (TCN)

TCN's objective is to supply sawn wood to the public and forest products industries at reasonable rates, quickly and efficiently (but not round logs). Since its inception, TCN has installed 42 sawmills throughout the Terai, the FD provides the TCN with logs and the TCN supposedly pays the FD the going royalty. They are located as follows:

<u>Development Region</u>	<u>Location</u>	<u>No. of Mills</u>	<u>Mills in running condition</u>	<u>Mills closed</u>
Central	Central Office, Hetauda	4	2	2
Western	Regional Office, Barghat	7	6	1
Mid-Western	Project Office, Bardia	10	-	10
Far Western	Project Office, Kailali	7	-	7
	Project Office, Kanchanpur	8	3	5
Eastern	Project Office, Jhapa	6	6	-
Total No.		42	17	25
(%)		(100)	(40)	(60)

The total annual sawn wood production capacity of one saw mill is about 75,000 cft. (2,124 cum) per mill, and all mills should produce 3,150,000 cft. (89,208 cum). But on the average TCN is producing only 813,409 cft. (23,036 cum) per year which is just 25.8% of the production capacity. The closure of sawmills seems to be mainly due to a lack of proper management and maintenance.

TCN is run by a board of directors who are shareholders also. The board is constituted as:-

- Chairman - Secretary, Ministry of Forest and Soil Conservation
- Member - Chief Conservator of Forests, Forest Department
- " - Representative from Ministry of Finance
- " - " " Department of Commerce
- " - " " Nepal Industrial Corporation (NIDC)
- Member Secretary - General Manager of TCN.

a. TCN Log and Sawn Timber Production and Sales

Year	Round logs produced Hft3 (M3)	Sawn timber produced ft3 (M3)	sold	Round logs sold Hft3 (M3)
FY 1982/83	1,525,441 (55,007)	824,409 (23,348)	719,505 (20,377)	143,782 (5,185)
FY 1983/84	1,512,613 (54,545)	928,750 (26,303)	911,964 (25,827)	255,816 (9,261)
FY 1984/85	1,621,145 (58,458)	777,272 (22,013)	765,189 (21,671)	1,145,986 (41,322)
FY 1985/86 (11 months estimated)	1,400,000 (50,484)	650,000 (18,408)	750,000 (21,240)	250,000 (9,015)

Average	1,549,667 (55,881)	813,409 (23,036)	804,772 (22,792)	459,484 (16,569)

TCN has a number of temporary and permanent log yards where they have been selling logs to the sawmill industry and private individuals. TCN also have a fleet of 62 trucks for log and sawn timber transport. Only 51 trucks are running or 82%.

TCN also have 25 sales depots and employs 1377 people directly and another 1000 indirectly through contractors.

TCN has a dry Kiln, a wood treating plant and a furniture plant. None is now working.

b. Financial Status

1. According to the Auditor General's Report 1986, in FY (1981 - 82), the TCN incurred a loss of Rs.14,504,000, when at one time in FY (1979 - 1980) they were making a profit of Rs. 14,800,000. The comparative figures for those two respective years show that in 1981 - 82 the sales have declined by 63% to that of the year 1979 - 80, but the sales expenditures have increased by 49% and administrative expenditures have increased by 65%. To a Company with a Share Capital of Rs. 6,900,000 and incurring a loss of 14,504,000 in one year, what will happen? How can it run?

2. Logs lying in stock to the value of Rs. 45,779,676. No verification and actual inventory of the logs and other properties. The actual financial status of the Company can not be told.

3. The Company has spent Rs. 21,290,997 for mainly buying the trucks. Whether the trucks have been utilized properly or not, no one can say, nor how much they worked, nor what loss or profit was derived from them.

4. For seasoning Rs. 677,441 were spent but only 1,622 ft³ seasoned wood were produced. Now the seasoning plant is closed.

c. TCN Debts

According to the latest information it is understood that financially, TCN is in the red. It owes Rs 34,000,000 for stumpage royalty to the FD; Rs 6,000,000 for income tax to the Tax Department; Rs 14,000,000 loan installment to the World Bank and Rs 10,200,000 as interest on the loan. Thus a total of Rs 64,200,000 is owed by TCN. TCN has been able to keep operating by not paying their bills, their taxes, and their loans.

d. TCN Sawmills

We recommend getting TCN out of the sawmill business. TCN sawmills are the first priority - they should be disposed of in an orderly fashion.

The book values of all these sawmills should be obtained and a schedule drawn up for auctioning off, with the closed mills being disposed of at once, and a schedule by zones or regions drawn up for disposing of the mills currently running. The biggest money losers going to the block first. If no bidders can be found for the complete package, then the pieces should be auctioned off and what can not be sold as equipment, should be sold as scrap.

We suggest the employees of the closed and running mills be given first choice to come up with a buyout plan. It is only fair to the TCN employees who have worked for the past years as loyal employees, to be given first choice to secure their jobs and investment.

The exception to this is the big-log sawmill in Hetauda that was financed by AID. This mill is not compatible with the present day sawmill industry in Nepal. The over and under circular saws have a 1/2 "Kerf" - a unforgivable waste. We recommend TCN auction the mill off "as is where is" and advertise the auction in Malaysia, Philippines, Indonesia and Papua New Guinea where big-log mills are still being used. Probably nobody will want the circular head saw, but the carriage, edger and other items are worth something.

(ii) FOREST PRODUCTS DEVELOPMENT BOARD - (FPDB)

The main objective of the FPDB was to stop people from helping themselves to logs and firewood in the forests and to provide these products conveniently for sale at wood yards in 11 Districts.

A list of their main activities are:

1. Round logs and fire wood distribution and sales
2. Three plantation projects - clearing old degraded forests and planting fast growing species.
 - Sagarnath
 - Ratuwamai
 - Nepalgunj
3. Rosin and turpentine factory
 - a. FPDB Log Production and Sales

Year	Logs		Sale Proceeds Rs.	Price/Unit		Exchange Rate Rs./ US\$
	produced Hft3(M3)	sold		Rs.	US\$	
1982/83	1,006,906 (36,309)	1,791,216 (64,591)	16,009,705	8.94 247.86	0.65 18.16	13.65
1983/84	664,589 (23,969)	936,998 (33,788)	12,387,469	13.22 336.62	0.87 24.06	15.24
1984/85	994,010 (35,844)	1,148,058 (41,399)	13,879,021	12.69 355.25	0.71 20.10	17.67
1985/86 (8 months)	468,619 (16,898)	364,660 (13,150)	16,800,393	46.07 1277.60	2.36 65.52	19.50

F.P.D.B. is run by board of directors, which are:-

- Chairman - Chief Conservator of Forests, Forest Department
- Member - Deputy Chief Conservator of Forests, (Forest Utilization)
- " - Representative from the Ministry of Forests and Soil Conservation
- " - Representative from the Ministry of Home
- " - " " Ministry of Finance
- " - " " Department of Commerce
- Member Secretary - Project Chief of FPDB

Financial Information

Auditor's General report of 1986, states that in the fiscal year 1983/84 - (1) Sub board Biratnagar's statement shows that 109,758 cft (3958Hft³) loss are missing from the Stock, upto now no action has been taken for such a huge loss. Similarly no action has been taken for large stocks of logs reported rotten or damaged by fire. (2) No accounts have been kept of trees handed over, the estimated volume and the actual volume. (3) According to the latest information available the F.P.D.P. owes Rs. 33.5 million to the Forest Department for paying stumpage Royalty.

a. FPDB Plantation Projects

(1) SAGARNATH PLANTATIONS PROJECT

The Forest Products Development Board (FPDB) under has carried on the SAGARNATH project since 1978/79. This project is based on converting degraded and unproductive forest into plantation of fast growing species. To date, they have cleared and planted approximately 5,500 hectares. Their goal is to establish 10,000 hectares.

The original idea of these plantation was to provide firewood for Kathmandu and the local area. Since starting, many lessons and procedures have been learned in plantation operations. The clearing and planting are being run with a high degree of efficiency and effectiveness, but the marketing of the old growth being cleared, is controlled by Kathmandu. According to the Auditor General's Report of 1983/84, there were 215 employees, 159 or 74% were temporary. This project would be a top candidate for a forest products company to acquire or at least bid on the forthcoming plantation wood, (Such as the Everest Paper Mill located at Janakpurdham, 60 kms away).

Disposing of Sagarnath Plantations

Dissolving or auctioning off these plantations at their present age (0 - 6 years), would receive interest of private fuelwood companies. No doubt they would clear fell the plantation for firewood. That would be a catastrophe. To have 6-7 years of research and experimental work lost would be a disaster. The knowledge gained on ways of operational procedures in the nursery, in the planting and in the tending of the stand, to lose this before bringing the stand to maturity would be a great loss to the country. It would be like harvesting the rice before it formed seed, just to use the straw. More than that, it would mean going back to square one for the next person or organization who tries to start a plantation to provide sawn or veneer logs as the product.

In section 13 the Industrial Plantation under III, we will discuss a possible use for the Sagarnath Plantations. This plantation could continue to be supported by the forestry industry reforestation funds collected annually by the Ministry. The real value of the plantations will be realized in another 10-15 years when the plantations have reached merchantable size. Fuelwood and small poles can be taken out in the prescribed thinning before the end of the rotation.

(2) RATUWAMAI PLANTATIONS PROJECT

Here 2,238 hectares of illegally settled land have been taken back by the FPDB and 950 hectares planted with a remaining 550 hectares to be planted. This area has been handed over to the HMG Tea Development Corporation for the eventual production of firewood needed in the tea processing.

(3) NEPALGUNJ PLANTATIONS PROJECT

In Midwestern Development Region in the District of Banke, a plantation project by the name of "Nepalgunj Plantation" will be carried out by the FPDB which consists of :

- i) Establishment of about 5,000 hectares of fast-growing fuelwood plantation
- ii) Construction of project management office, and living quarters for field staff
- iii) Establishment of a tree seedling nursery
- iv) Construction and maintenance of about 38 km of all weather road and 38 km of fair-weather plantation road.

The project is expected to be completed by December 1990. The amount of loan provided by A.D.B. is US \$ 9,769,000.

Plantation development in Nepalgunj will follow the same methods and procedures for land clearing and site preparation, planting, intercropping and fire protection as followed in Sagarnath. The important difference is, in the use of more private contractors for seedling production, planting and plantation protection. Until now this feature has largely been untried in Nepal, so consultant services will be provided to assist with the preparation of contract specifications and monitoring.

Nepalgunj tree plantation component costs are U.S. \$ 5,976,000.

The project is designed to assist the country to meet its increasing fuelwood demand by growing high-yielding tree species. The degraded, low yielding natural sal forest will be converted to fast growing plantations. Thus additional 55,000 M3 of timber and about 345,000 M3 of fuelwood will be produced and sold.

C. Rosin and Turpentine Factory (R & T)

In 1976 a feasibility study was prepared on the establishment of a rosin and turpentine factory in the FWDR. The capacity was to be 4000 MT/year with possibilities of expansion to 6000. The resin would be collected from Kailali, Doti, Dadeldhura and Baitadi Districts. Resin was already being collected in these Districts by Laxmi Tapping Pvt. Ltd. and exported to India.

On April 13, 1978 an agreement was signed between HMG and the USSR where by the USSR agreed to provide a loan of Rs 54 million and technical assistance in the design, construction and start up of a rosin and turpentine factory. The loan carries a 2.5% interest charge with a five year grace period from the date of agreement. Principal and interest payments both commence five years after date of agreement.

The R & T factory was put under the FPDB. FPDB officials stated that in addition to the USSR, HMG has invested another Rs 49 million, making a total investment of Rs 103 million (US \$ 4.8 million).

Private industry executives have stated that the factory is overpriced and that the same factory could be purchased from India for one third of the cost.

The trial run has been successfully made and the factory has now started up.

(a) Privatization of the Rosin & Turpentine Factory

HMG will probably not put the Russian rosin and turpentine factory on the auction block for sale to the public for ideological reasons.

Perhaps FPDB could put it up for lease to the highest bidder now that the resin contract has been signed with LAXMI TAPPING (Pvt) Ltd. This is a 15-year contract with price escalation every three years.

FPDB could make a stipulation in that the leasor should form a public company and offer 49% of the stock to the public. In that way the leasor would still have control with 51% interest.

The lease agreement should be such that the leasor would make a profit, but that the lease payment would be enough to cover the annual payment of principal and interest on the USSR loan (about Rs. 10 Million) and help HMG recover their part of the investment. The loan is to be repaid in five to six years.

Without the financial details, it is difficult to state the workability of this recommendation, but something along these lines could be pursued so that the leasor makes a profit, people are gainfully employed, the country benefits because the products are exported and HMG is able to pay off the loan and still not have given away an asset.

(iii) FUELWOOD CORPORATION - (FWC)

The FWC, according to their General Manager, supplies Kathmandu with 53% of its firewood. Of the 130,000 - 140,000 MT of firewood sold by FWC, over 60% is household consumption and 40% is consumed by industry.

The Auditor General's annual report (1984) part 3, states that -- "Fuelwood Corporation's financial matters are not known since FY 1981-82. No financial statements were submitted by the corporation and therefore no audit could be done and no report prepared".

It is understood that the FWC owes Rs 5,000,000 to the FD for royalties and Rs 2,000,000 to the Tax Department for income tax or a total outstanding debt of Rs 7,000,000.

FWC is run by board of directors which consists of the following:-

Chairman	-	Chief Conservator of Forests, Forest Department
Member	-	Representative from the Ministry of Finance
"	-	" " Zonal Commissioner's Office (Bagmati Zone)
"	-	" " Forest Department
"	-	" " Commerce Department
Member Secretary	-	General Manager of the FWC

(iv) Summary of TCN, FPDB, FWC

Apart from the TCN sawmills, the rosin and turpentine plant and the plantations, it does not appear that these entities have much in the way of hard assets.

We recommend the closing down of the TCN, and FPDB wood yards. Such assets of the inventories of all those old logs that have been lying around deteriorating should be auctioned off. What cannot be sold as logs should be sold as fuelwood. The log yards themselves do not appear to have much value.

A schedule should be drawn up to close the FWC's fuelwood yards so they could be phased out over a reasonable period of time to give the private fuelwood companies an opportunity to fill the gap.

(v) HERBS PRODUCTION & PROCESSING CO. LTD.

HPPC is run by a board of directors which is composed of the following:-

Chairman - Director General, Department of Medicinal
Plants
Member - Representative from the Forest Products
Development Board
" - Representative from the Ministry of Forests
Soil Conservation
" - Representative from the Ministry of Finance
" - " " " Agricultural
Development Bank
Member Secretary - General Manager of HPPC

The Auditor General's Report (1986) Part 1 shows that in the FY 1984-85 the Company incurred a loss of Rs. 766,000. The previous years losses amounted to Rs 1,121,000. Thus a total loss of Rs 1,887,000 upto July 1985.

(vi) ROYAL DRUGS CO. LTD. 1983/84

This Company was established in 1972 under the Companies Act of 2021 (1964) to produce drugs from indigenous medicinal plants and herbs.

Royal Drugs Company is run by a board of directors which consists of the following:-

Chairman - Secretary, Ministry of Forests and Soil
Conservation
Member - Representative from the Department of
Medicinal Plants
" - Representative from the Nepal Industrial
Corporation (NIDC)
" - Representative from the Ministry of Health
Member Secretary - General Manager of the Royal Drugs Co.

According to Auditor General's Report 1986:-

1. The Company has not yet obtained the title of land (Red Ownership Chit) of its premises consisting of 44.5 Ropanis which were occupied nine years ago.
2. The Company is unable to use the machinery and equipment it received from the United Nations Children's fund and UN Industrial Development Organization costing Rs 5,817,876. They are now idle.
3. Procured materials are not used properly and losses in production have been reported.

4. Total number of authorized manpower is 240, but there are 211 permanent employees and 115 working for wages thus making a total of 326 people.

(vii) BHRIKUTI PAPER MILLS

Bhrikuti Paper mills is under the Ministry of Industry, but dependent of the Forest Department for almost half of its furnish of Sabai grass.

The mill is still being run by the Chinese start-up crew. Unless the Chinese stay for several years, we believe the Nepalese may have trouble running the mill. The history of the new mills built in Bangladesh, Tanzania, Kenya and others, indicate that it takes at least a minimum of 5 years to train an efficient paper mill crews. It may be advisable to keep the Chinese for a longer period. If it is not possible, some experienced foreign paper companies could be asked for management and profit-sharing proposals. That way, management and profits responsibility will be in the private sector, but HMG will still retain the Chinese gift. Indian paper companies that have 52% of the Printing & Writing Paper market would probably be the most interested. Not to be ruled out, are South Korean and Japanese Companies.

Bhrikuti Paper Mills is run by a board of directors consisting of:-

Chairman - Joint Secretary, Ministry of Industries
Member - Representative from the Ministry of Forest
and Soil Conservation
" - Representative from the Ministry of Finance
" " " " Ministry of Industries
" - Director of the Department of Industries
Member Secretary - General Manager of Bhrikuti Paper Mills
(BPM)

C. THE FUTURE OF THE NATURAL HARDWOOD FOREST OF THE TARAI

Our best estimate of the smaller industrial wood flow is about 300,000 M3 per year (8.3 million Hft3). In the Tarai (where most of this wood comes from) there are an estimated 600,00 hectares of forest out of which there are 380,000 hectares considered to be mature commercial forest. An estimated 80,000 hectares of these mature commercial forests are in National Parks and Wildlife Areas (we are unable to confirm this figure; 80,000 is our estimate). If we assume that these unmanaged commercial forest of 300,000 hectares, are growing at the rate of 1 M3/ha/year these forests would just barely keep up with present demand. If we assume that the FD puts these areas in "National Forests" and under rudimentary forest management, the growth rate could be increased to 2 M3/ha/year. Then, this would, at least, put the growth and drain in balance and give supply to possible expansion in plywood and P&W paper industries (70% of the present supply is coming from

India and other countries). With the GDP growing at 3% a year the demand for industrial wood could increase to 400,000 M3 by 1996 and 450,000 M3 by the year 2000. Printing and Writing (P&W) paper is increasing at a much faster rate - (8.8%/year).

There is a belief on the part of many people that the forests of the Tarai are doomed to be turned into agricultural land. That may be the future, but it will still take 15 to 20 years to happen. Even with this prospect, Nepal would be further ahead by putting all their Tarai National Forests on a 2-cut liquidation management plan. Such a plan would call for the mature commercial forests to be cut over on a selective cut, taking out the mature and overmature trees and leaving the immature trees to grow. Then after the first cut is completed, say in 10 years, they would go back and fell the remaining stand, thereby gaining the growth of 10 years on these former immature trees that would by then be 10 years closer to maturity.

If 30,000 hectares a year were selectively cut for 10 years, and it took another 10 years to clear-fell the forest for the final cut, they would gain (10 years growth x 30,000 ha x 10 years = 3 million M3) an additional 3 million M3 over the next 20 years that they would not otherwise have.

If Tarai forests are ever to be converted into agricultural land, one thing to remember is that Nepal, which already has a tremendous trade deficit, will have to import forest products too from other countries. Can Nepal bear this burden?

II. FIVE KEY RECOMMENDATIONS

- (1) Establish the indisputable right of private interests (farm and industrial) to own, manage and exploit for use or sale forest property and the products thereof without vitiating interference by public authorities.
- (2) Establish and put in practice procedures whereby private (farm and industrial) interests can, with proper safeguards, acquire forest land from the public domain in freehold or leasehold whether under trees or not.
- (3) Abolish permits required for transporting forest products and for cutting timber trees on private lands.
- (4) Designate, demarcate and declare areas of national forest for which the Forest Department will have managerial responsibility.
- (5) Declare all forest lands not in private, national forest institutional or otherwise reserved ownership, the property and responsibility of the panchayat, ward and/or user groups within whose boundaries they fall.

III. DISCUSSION AND CONCLUSIONS

A. Major Forests

Based upon the information developed by the LRMP and Forestry Sector Master Plan Projects, the forests to be designated as major and minor forests.

The major forest will consist of those areas which are of substantial size and which are not under pressure for conversion to agriculture and for support to local farms generally. They will be principally in the Hill areas and recognizably important for their watershed protection value, but will include some forest in the Tarai. Based on such criteria, a register will be prepared of such areas for possible inclusion starting with the largest solid blocks where the watershed value is most critical and where there are fewest problems with the local people, and moving downward toward the opposite conditions. The management of such national forest must be adjusted to the present capabilities of the Forest Department in personnel and financial resources. The Forest Department will take on full responsibility for limited areas. The responsibilities will include:

1. Clear on-the-ground demarcation of the boundaries of the national forests.

2. Registration and certification of enclaves of private property and servitudes within the forest boundaries to be recognized as compatible with the protection of the forest.
3. A Management plan with provision for:
 - a) Protection from human and animal trespass, fire, insects and diseases.
 - b) Inventory and utilization of the resources, including timber, firewood, minor products, fodder, grazing, water, and recreation.
 - c) Regeneration and improvement of quality and species composition of the forest. These activities will include identification of areas for artificial regeneration, salvage removals, thinning, pruning, regeneration and improvement cuttings.
4. Establishment and maintenance of cordial and cooperative relations with the local people. They will include provision for their needs for forest products and priorities for employment, identification of areas exceptionally suited for settlement and agricultural use to be excluded from the national domain, and consideration of their needs in the road development plan.
5. Organization and assignment of the personnel needed to protect and manage the forest, including, equipment, transport, training and supervision, with a definite annual schedule of activities, and a manual of duties and procedures.

The foregoing proposals represent a radical departure from policies which the Forest Department follows at present. They are contrary to its traditions, experience and present mandate. They will require leadership fully sympathetic to the objectives of geographically restricted but effective forest management. The consultants suggest that the register of the national forests be legally established and their external boundaries demarcated, but that their management as described be put in operation according to a schedule commensurate with the resources of the Forest Department.

The procedures for such establishment and demarcation can draw on the experience with the presently existing national parks, wildlife and hunting reserves, whose number is 11, and whose areas amount to 1,002,890 hectares. They receive more effective protection than most forest lands.

The consultants suggest that the resources in personnel, equipment and funds needed for the management to be applied can be found by relieving the Forest Department of other duties. As areas are considered suitable for national forest, certain ones will become more obvious in meeting the criteria suggested above. Other areas will appear less suitable for national forest and more so for another category. Many factors other than size enter the decision. Nevertheless the consultants suggest that areas of 1000 hectares or less should probably be considered as more appropriate for local than national management.

B. Minor Forests

The minor forests will consist of those areas of land not now otherwise reserved or in private ownership or cultivation and not considered suitable for national forest but which are suitable for retention as forest land in the widest sense, including the multiple uses of timber, grazing, water and other products. The consultants suggest that such areas be recognized immediately and by decree as belonging to the panchayats, wards and or user groups within whose boundaries they fall. They will include buffer zones around the national forests and areas in which the local user rights are so pervasive and well established as to make local management more appropriate than national management.

(i) Transferring of forests to Panchayats

The consultants believe that the present mechanism for transferring national land into panchayat forest and panchayat protected forest is too cumbersome to operate efficiently. In eight years since the promulgation of the rules governing the transfer of forest land to the panchayats, only 42,651 hectares have been so transferred and in no case has the transfer included legal control. Thus the rules have not been effective in realizing the advantages envisaged for the policy of such transfers. If the transfer of ownership and responsibility were definite and rapid, the panchayat officials would have to face their responsibilities to the people within the panchayat area. Furthermore such transfers would relieve the Forest Department of responsibility for small and scattered forests for whose management the present resources and policies of the Department have proved inadequate.

To provide resources for the added responsibilities, the consultants suggest that:

- a) The panchayat receive directly without passing through the Ministry of Finance, all the income from the panchayat forest lands, without distinction between panchayat and panchayat protected forest.

- b) A real property tax be assigned to local administration for collection and use.
- c) The panchayats be authorized to employ their own forest personnel needed for the management of their forest lands.
- d) The panchayats take over all Forest Department seedling nurseries and sell the seedlings produced.
- e) The Forest Department continue to provide technical advice and guidance to all categories of forest land.

The transfers proposed would place the sources of most of the firewood used (about 16.5 million cubic meters annually, 93 percent of all wood used) within the purview of the panchayats. It is a radical proposal but conforms to the policy of decentralization proclaimed in 1984. There are 4051 panchayats in Nepal(2). Faced with such responsibilities, they will respond with various degrees of effective interest. Policy should therefore be to identify and reward with help and recognition those which are most effective in realizing the benefits of developing their forest resources. Examples exist of panchayats which have done so even without the financial or technical participation of outside help(3).

The proposed policy changes reverse the Private Forest Nationalization Act of 1957 more radically than the Panchayat Forest, P.P.F. and Leased Forest Rules of 1977 and 1978. Before 1957 the forests received more conservative use because the nearby people felt more responsibility for them as a local resource to help solve the problems of daily living.

(ii) Revision of forestry laws and reorganization of Forest Department

The present forestry laws and regulations must be revised into a simplified and consistent code. The points suggested for inclusion in a revised code are the following:

- a) The Department of Forestry be relieved of all control and revenue collection duties other than those pertaining to national forests.
- b) The legality of private ownership and management of forest land be recognized, including the right to use, transport and sell both planted and spontaneous trees and their products in any way the owner of the land on which they grow sees fit without undue interference.

- c) A clear definition of what constitutes forest land is needed. Such a definition should include most of those lands not in permanent or temporary cultivation or seeded pasture. Such lands do not necessarily have live trees on them and may be more valuable as sources of products other than trees.
- d) Re-organization of the Department of Forests into three divisions, namely;

National Forest Management

Research, including forest inventory and economics

Co-operation with panchayat, institutional and private forestry

C. Re-organization of the Ministry of Forests and Soil Conservation

Reorganization of the Ministry of Forests and Soil Conservation so as to decrease the number of entities either by consolidation or transfer to more appropriate ministries. Specific suggestions in this regard are the following:

- a) Abolishment of the Forest Products Development Board, The Fuelwood Corporation and the Timber Corporation of Nepal. Organize a single public limited company whose responsibilities are for supervising exploitation and marketing timber and firewood from lands in the process of conversion from forest to agricultural settlement but not national forest. The area of such land is certain to decrease , and hence the proposed corporation will finally have no further functions.
- b) The proposed corporation will undertake no new industrial projects, will close down or sell the sawmills of the Timber Corporation, and will lease or dispose of the resin processing plant.
- c) Removal of the Department of Resettlement and the Nepal Resettlement Corporation from the Ministry of Forests and Soil Conservation, and either abolish them or place them in a more appropriate ministry.
- d) Transfer the Department of Medicinal Plants to the Ministry of Industry, Department of Cottage Industries, to work principally with private voluntary organizations, private cooperatives and individual farmers in developing plants of medicinal use on forest land. The development will take place so as to avoid competition for agricultural land and make more intensive use of forest land.

e) Provision for the rapid sale to private owners of the Royal Drug Corporation and the Herbs' Products and Processing Company Ltd.

4. Within the Ministry of Forests and Soil Conservation, the Department of National Parks and Wildlife has responsibility for over one million hectares in eleven areas. Their management has been more successful than that of the Forest Departments's management of forest lands because

- a) the areas are demarcated;
- b) the areas are largely in the less populated sections;
- c) the Army has participated in their protection;
- d) the areas have specific purposes.

Like procedures can be usefully applied to critical watershed areas to be designated as "Nature Reserves" and placed in the Department of National Parks and Wildlife with provision for the local people. This suggestion is an alternative to that of national forests where timber is not a primary goal.

D. Soil Conservation Programs

Writers on the land-use problems of Nepal have given a great deal of attention to soil erosion and soil conservation. With perhaps excessive insistence and stridency, some cite the millions of tons of topsoil "exported to the Gangetic plain each year, the rocks and rubble spread over the Tarai, the widening gulleys, eroded slopes, and farmlands either washed to bare soil or covered by silt". The results are less land for cultivation and lower yields from those still under crops and pasture.

In describing such disasters they point to excessive demands upon the land for firewood, grazing and field crops, and cite as evidence numbers of animals, deforestation and cultivation of marginal lands. Such problems were among the first to receive attention from foreign aid programs and have resulted in the Department of Soil Conservation and Management within the Ministry of Forests and Soil Conservation (1974). At present there are approximately 20 forestry-related projects in Nepal supported in part by foreign aid, all of which to some extent receive their support because of concern for soil conservation problems and the hope that planting trees and building structures will mitigate them.

Insofar as they do plants trees and build structures, the projects have impinged upon the problem, but have had little overall effect upon its dimensions. The expenses of physical barriers such as check dams and gabions are very great and the numbers needed very large. They are beyond the capabilities of the government to handle. More important, their construction and maintenance are also usually beyond the means and outside the interest of the rural populations. The local people see them as sources of employment rather than as furthering their farm enterprise. Experience with the RCUP bears out such a conclusion. That project henceforth will give attention to soil conservation structures within the interest and means of the local people to carry out build and maintain them.

The consultants believe that in making the case for forestry and the externalities of reforestation, it is not wise to do so in apocalyptic and catastrophic terms of soil erosion. A more positive approach is through the immediate usefulness of trees to individual farms and user groups. For example, if choices exist between planting trees to control a gully and planting trees near a homestead for firewood, fruit and fodder, the second is the better choice. Improvement in terrace construction is a more useful expenditure than construction of check dams, not because better terraces necessarily result in more torrent control but because better terraces are closer to the farmers problems of daily living and hence receive their support.

E. Reforestation Programs

(i) User groups

The above observation has implications that go beyond soil conservation. It has been widely noted that reforestation becomes more successful as it moves towards smaller units of government, towards user groups and finally towards individual farms. For this reason, among others, the consultants suggest using the panchayat rather than the district for forest management responsibility. Nevertheless within each panchayat are nine wards, and within the wards are hamlets and user groups. The latter term refers to variable numbers of households to which custom has given the right to collect and use the products of certain pieces of forest land. For example, the Nepal Australia Forestry Project has successfully identified a number of such groups and helped organize their management of forest lands (4).

The consultants suggest that the panchayat officials, with responsibility for the management of forest lands within their boundaries, should as far as possible work through such groups by establishing registers of the users and providing for systematic rather than haphazard harvesting of products.

Work with user groups has been successful in that it incorporates to some degree the characteristics of private action that is, it moves closer to personal action and responsibility. It thus points toward the private sector and the principal subject of this study.

(ii) Seedling distribution

Without exception the reforestation projects which the consultants have visited or read about include a component of distributing trees to individual farmers. This component absorbs the seedling trees not needed for meeting project reforestation targets. Unfortunately it seems to offer the poorest and left-over planting stock at the end of the planting season. Moreover the trees grown and distributed to farmers have not been necessarily the fruit and fodder tree species which are of most interest to the farmers for planting on their lands. Furthermore the nursery managers do not show interest in where and why the seedlings are planted, or their rates of survival and use.

Nevertheless this component can certainly be expanded, especially if the farmers needs for fodder and fruit trees enter more strongly into the mix of species offered. Low survival rates where they exist are most probably due to the distractions of other farm work and carelessness. The consultants suggest that the recipient should pay at least the cost of producing the seedling, which is about 0.50 Rupees. Although such a policy will result in fewer seedlings being distributed, the increased survival will no doubt more than compensate for such decrease. Charging for seedlings will further facilitate the transfer of seedling nurseries into institutional (such as school) hands and into the private sector. The consultants noted that such nurseries exist which offer better planting stock and the species such as fruit and fodder trees which the farmers prefer.

(iii) Farmers interest in trees

Nepalese farmers plant many trees around their fields and houses and allow the growth of spontaneous seedlings elsewhere. They do so probably in relation to the number of livestock for which they need fodder and in inverse relation to the availability of public lands from which they can take the tree products which they need. The overriding preference is for trees that supply fodder for their livestock and that, through the livestock, maintain the fertility of the croplands. Nevertheless the typical landscape has considerable areas of uncultivated land in private ownership and on which farmers could plant more trees and thereby lessen their dependence upon public lands (5). Among the constraints for their not planting more trees may be the following:

- a) Lack of high-quality planting stock of the species of interest within reasonable distance and at the start of the planting season;
- b) Uncertainty as to the ownership of uncultivated land and the ownership and use of trees, the permits, charges and formalities required to fell, use, transport and sell wood and other forest products;
- c) Lack of knowledge of the effects of trees upon soil quality and crop production;
- d) Lack of economic studies in farming systems to establish the most efficient use of the farmers' resources in land, labor and equipment. The tree-planting season does come during the busiest season for agricultural crops. Farmers naturally give first attention to their crops. Nevertheless a point comes where their total welfare is increased by planting trees rather than crops on marginal land. The Farming Systems Research Division in the Ministry of Agriculture is studying how much effort farmers should rationally devote to planting trees rather than other crops on submarginal lands.
- e) Research, more careful placing and management of nurseries and, in case of the second constraint, a clarification by the Government of policies toward private real property can lessen such constraints.

One can assume that a farmer's further interest in planting and caring for trees is in their direct effects upon crop and livestock production. Such effects come about principally through:

- a) the leaf-fall of trees, especially of nitrogen-fixing species, standing on or near enough to croplands to add nutrients to the soil. The case of *Acacia albida* in Senegal can be cited where 50 such trees per hectare add 615 kilograms of nutrients per year. Such action is important in a country such as Nepal which has no national source of chemical fertilizers.
- b) the effects of tree shade in increasing the well-being of livestock. Studies by the International Center for Agro-Forestry Research in Kenya show that such effects are considerable. Moreover nitrogen-fixing trees mature and well placed can add 100 kg of pure nitrogen to pasture grasses per hectare per year with a net favorable effect upon the forage. Livestock productivity is directly related to the nitrogen content of their feed.
- c) the effects which trees offer against desiccating winds.

The place of fodder trees in maintaining soil fertility through livestock is well recognized in Nepal. A study by Wyatt-Smith concluded that one hectare of cropland needs three hectares of land in fodder-producing trees and grass to sustain the fertility of the one hectare (6).

(iv) Advantages of private farm forestry over public programs

The consultants believe that the such benefits provide the strongest motive for planting trees because, among other reasons, they combine both private interests and public interests. The private interests of the farmer are sufficient for him to integrate trees into his farm enterprise without subsidy. Public action need be principally to remove the constraints indicated. The three principal advantages of private farm forestry over public programs are the following:

- a) The public sector is thereby relieved of the enormous burden of reforestation programs as currently conceived and in part carried out. The needs are thought to be 50,000 hectares a year just to replace current losses of forest land, and project costs per hectare are stated to average about 3500 rupees. Since only about half the seedlings survive, the total annual estimated cost comes to 350 million rupees for 50,000 hectares. Such expenditures are not within the realm of reason either for government resources or foreign aid or both together.
- b) Trees have value in relation to place and needs. Those that are of vital concern to farmers for fodder and firewood and placed near their fields and homesteads are of greatest value to the rural life generally and to the country. Moreover because the farmers have an interest in the seedlings survival, the rates of survival and growth are likely to be better. In this way the wasteful practice will be avoided of growing, transporting, planting and losing seedlings, which practice appears to be too widespread.
- c) The consultants do not advocate the replacement of agricultural crops or labor with trees except where the crop fall short of the margin of profit. In many cases the farmer will plant trees on land with no opportunity cost and with extra labor that would not otherwise be employed. Thereby reforestation can be brought about with the most net economic gain and without the costs of planting associated with the public domain (7).

(v) Firewood and fodder tree planting

In discussions of forestry in Nepal, firewood receives a great deal of attention. Much of the tree planting which the 20-odd forest projects carry out has its origin in concern over the shortage of firewood. Such concern is also responsible for the Fuelwood Corporation in the Ministry of Forests and Soil Conservation. Consumption of firewood is thought to be one cubic meter per head per year that is, over 16 million cubic meters. That figure is 93 per cent of all wood consumption.

One difficulty with firewood projects is that rural people do not look upon firewood with the same sense of urgency as do the urban population and officialdom. Their chief interest is in fodder trees, with firewood an important but incidental product thereof. Moreover in the absence or dearth of wood, they do have other options such as dung and agricultural residues. But firewood trees do not catch the interest of farmers to the degree that fodder trees do.

To mitigate this problem, the consultants suggest the promotion of improved stoves and fuels other than wood such as electricity and kerosene in the cities. In the rural areas cooking equipment and methods should receive attention as well as planting trees on farmland rather than in more distant woodlots, and the lifting of restrictions on the transport and sale of firewood. More attention is needed as to how the 16 and odd million cubic meters of firewood a year can be cut and used with less labor, danger and waste. Examples are the use of saws for cutting branches and pollarding instead of lopping trees to avoid the danger of falling.

(vi) Panchayat and leased forests

By the Private Land Nationalization Act. of 1957, all forest land became national property. Rules of 1977-1978 provided for panchayat forests, panchayat protected forests, and lease forests. The last allows institutions or individuals to lease open land of from 2.5 to 68 hectares up to 30 years upon payment of an annual rent. The exact terms have not been defined and no case of such a lease has come to the attention of the consultants.

Procedures do exist whereby individuals and corporate bodies can acquire public forest land by removing the trees and converting the land to agriculture. The procedures have allowed large tracks of forest land in the Tarai to become cropland, not all of which is suitable for crops.

In the Hills, the question of large industrial plantations does not arise. Nevertheless to be viable, each farm needs forest products, principally fodder and firewood. The

question then arises as to whether such products best come from community or private forest lands. Undoubtedly there are advantage and place for each. The proportions will vary according to the specific circumstances of each panchayat. They will vary according to local traditions, social structure, human and livestock populations and so on.

The principal advantage of private ownership is that the individual looks after his own interests more carefully than those of the public, and the public is usually better off with the results. Some mechanism needs to be in place whereby individuals or groups can control and eventually acquire forest land as well as agricultural land. The procedure suggested is that the forest lease law be clarified and revised to provided for:

- a) implementation by the panchayats;
- b) long-term lease and/or transfer of title after a period of performance in management and development satisfactory to the panchayat;
- c) payment of a rental at least equivalent to a real property tax;
- d) the right to use or sell the products without interference;
- e) cancellation of the lease agreement only by the verdict of an impartial independent judiciary with the right of appeal;
- f) size to be adjusted to the needs and resources of the applicant.

The conceptual problems of transferring public forest land into private hands fall into two main categories. First, it is objected that private owners will inevitably abuse and destroy their own property. If cropland is evidence, the extensive terracing of the Hills indicates that for centuries Nepalese farmers have been protecting their lands from erosion. Most degradation has taken place as a result of natural processes and on communal lands for which no one individual has responsibility. Moreover the lands suggested for transfer are not necessarily under trees. They are lands needing investment principally in protection from open range grazing.

Second, one can point out that such transfers can bring into conflict the social goal of equity and the economic goal of the more efficient use of resources. That is, such transfers will move toward farmers with more cropland to maintain (which is the principal though not the only use of forest land), with more resources to develop and protect the land, and with more political clout. Those with less such resources and thus more dependent on communal lands, will suffer as a consequence. The second consideration is serious and may render the concept politically unacceptable unless transfers are available both to the landless and landholders.(8)

Nevertheless the proposal involves a basic concept of development. The suggestion already appears that the Forest Department relinquish control over the forests other than those designated as national, the rest being either panchayat or private, and that their actual management and use devolve toward user groups and individuals. By user group is understood a smaller and more coherent entity than the more usual term community. Community forestry is open to the abuse of the commons; that is, what is everyone's property is no one's property. Furthermore, equal or at least fixed sharing locks people into the present status of small uneconomic farms and marginal existence with no surplus for sale.

In any community certain individuals have more energy, intelligence or luck than their neighbors. It is in the interest of society as a whole that such individuals be allowed to exercise their talents. The objectives of transfers are viable farming units, farming units with enough forest resources to sustain the quality of their livestock and their croplands. No matter how diligent the farm family, a few ropanis of hill rice, a few head of livestock and access to over-grazed public land do not make a viable farming unit.

The consultants therefore, suggest that the procedures be established for transfer of public domain into private property, and that they take place at the discretion of committees such as the Forest Consolidation Committees and panchayat officials under the supervision of the Ministry of Panchayats and Local Development and the advice with of the Forest Department.

F. Suggestions for AID's further participation in the forestry sector

Specific suggestions for AID's further participation in the forestry sector are the following:

- a) This report has outlined a strategy for a more effective forestry effort on the part of the government and donors. If the donors can agree on the strategy of moving toward the private sector and accept the suggestions made, they should withhold further new projects or project extensions until the administrative and legal structures are more favorable. The most important of these is the indisputable right of private interests to own, manage and exploit for use or sale forest property without vitiating interference by public authorities.
- b) In current and proposed projects with a forestry component, use can be made of private or semi-private (such as school and cooperative) seedling nurseries and their output adjusted toward the species, time schedules and localities most useful to farmers.
- c) Provide technical expertise to wood-using industries in how to make better use of their equipment and advice on capital investments, particularly for paper and wood-based panels.
- d) Aid the Forest Department in preparing a manual of job responsibilities and procedures.
- e) Support the Research Division of the Forest Department in the silviculture of natural stands of the genera Pinus and Shorea, and in procedures for gathering and organizing statistics of forest industries and the consumption of their products.
- f) Advisory assistance in carrying out the recommendations herein contained.

G. Forest Industry in the Tarai

Forty percent of the population is reported living in the Tarai. Almost all of the forest industry is located in the Tarai.

(i) Forest products industries

Below is a list of the forest products industries mainly in the Tarai (and elsewhere). They are listed by type of industry, the volume of wood they are allotted from the FD, their production or out-turn of goods and the number of employees. The only sawmills who obtain logs from the FD are those from the TCN. All private sawmills must buy their logs from either TCN or FPDB either by permit or by auction.

Location of these plants can be found in the Map Section, Appendix VIII. A more complete description of each industry can be found in Appendix VI.

Table - VI List of Forest Products Industries

No.	Type of Industry	Annual allotment (Quota) from FD Hft3 1/ (M3)	Annual Production (out turn)	Number of permanent employees
<u>Sawmilling</u>				
	TCN	1,500,000 (54,000) 2/	800,000 ft3	1,377
9	Private Veneer (Tea Chest Industry)	no quotas 690,000 (24,900)	1,277,000 ft3 N.A.	2,500 estd. 450 estd.
2	Plywood (and blockboard)	500,000 (18,000)	3.4 mil. ft2 200 M3 Block Board	350 estd.
4	Wood seasoning	310,000 (11,180)	186,000 ft3	250 estd.
1	Flooring	50,000 (1,800)	173,000 ft2 8 mm thickness	67
3	Furniture	65,000 (2,340)	N.A.	225 estd.
9	Match	882,500 (31,820)	1,270,000 gross boxes	1,000
<u>Extractive Plants</u>				
5	(a) Kathha Cutch (by product)	1,022,600 (36.875)	1,636 MT 3,772 MT	1,200
1	(b) Resin rosin turpentine	10,000 MT	2,915 MT 645 MT	600 estd.
4	(c) Sal seed oil	26,000 MT	?	100 estd.
2	Paper Mills (P&W)	1,100 MT (sabai grass)	4,500 MT	604
2	Miscellaneous	130,000 ft3	N.A.	75
				----- 8,748

1/ Hft3 = Hoppus cubic feet converted to true cubic feet by 1.2734 factor.

2/ mainly from TCN and FPDB log auctions

Seasonal employees number several thousand. (Appropriate Forest Industries)

Source: Master Plan Draft for Forestry Sector

(ii) Build-up of industrial growing stock in the Tarai

The sawmill industry, which may account for half of the industrial wood used is treated as second class citizen. The 200 odd private sawmills cannot obtain quotas from the FD.

While, the 2 P&W paper mills are not now using wood as their raw material, a great potential exists for their using wood in their furnish. At present both mills are using rice and wheat straw and waste paper. The Bhrikuti mill is also using sabai grass under a FD allocation quota. Both mills are having a difficult time collecting enough straw and grass.

Many of these forest products industries are in a precarious position in obtaining enough wood to keep their operations running profitably. At the same time, the consultants observed large quantities of aged logs (and lumber) lying in the TCN and FPD log yards and the TCN sawmills, a loss for everyone.

In conversations with various forest products industry managers, they told us that they want land to establish their own plantations in order to secure their wood requirements.

So desperate has industry become for wood that Butwal Plywood Factory (BPF) has obtained (after five years) 130 ha. of (FD) land at Joikuti, 10 Kms. south of the factory, with the object of establishing a tree nursery, a demonstration plantation and trial plots of irrigated poplar clones. In order to help defray the cost of this "show me demonstration" they are intercropping the plantation with peanuts, mustard, buckwheat, gram, cow peas, pigeon peas, ginger and turmeric.

So far BPF has been unable to work out any kind of agreement with the FD as to the legal status of the land, taxes, royalties, and who has the right to the final tree crop. In spite of this, BPF, in desperation to find a solution to the problem of raw material, is committed to invest Rs. 500,000 in the plantation.

If they can demonstrate that it is a paying proposition, they hope to convince other land owners to plant trees with intercropping and BPF will guarantee to buy the mature trees.

To cite other examples:

The Tinau Wood Seasoning Company of Butwal last year, requested 17 ha of land for plantation from the FD. To date no answer.

- The Nemo Parquet Flooring Company (Hetauda) General Manager said that he submitted a proposal one year ago for an allotment of land for a plantation. He wants to plant the trees and have them reserved for his company.
- The Western Wood Industries Match Plant's manager in Dhangadhi has submitted a proposal over 5 years ago to FD for the growing of poplar plantations for his match factory. Every time he inquires about the status of the proposal, he is told "It's in the file".
- Laxmi Kathha Factory in Dhangadhi planted 7 acres of Khair on FD land last year with no agreement as to whose trees they are.
- Nepal Plywood's Manager said he wants 40 ha of FD land to plant trees for his plywood mill. He does not want to pay rent or taxes but is willing to pay royalty when the trees are mature. He also wants 80 ha to supply the Juddha Match Factory.
- Bhrikuti Paper Mills is talking about trying to grow their own sabai grass if they can get the land, or get private people to grow it on their own land and the mill will guarantee to buy it.
- Swedish Match is asking the FD for 2000 ha in Bara or Sarlahi Districts to establish an irrigated hybrid poplar plantation.

(iii) How can Industrial Plantations be Accomplished ?

How can this be accomplished? There are a number of examples of successful industrial plantations in India, the Philippines, Indonesia and Malaysia. A lot of pioneering work has already been done, Nepal can benefit by following their examples.

(a) Indian Example

For instance, WIMCO, the Indian match company, is enthusiastic about their irrigated plantations of poplar clones. They earlier reported a conservative figure of 15 M3 MAI (9), but recently we heard from Per Lindgren of BFP that growth rates of 30-35 M3/MAI have been obtained. While we believe the later to be exceptional, a 20-25 M3 MAI with clonal poplar does seem realistic. We take the Dhangadhi match factory as an example, which has an annual quota of 565,000 Hft3 (20,000 M3), which they never get. If this company had 1,000 ha of poplar plantations and these plantations were on a 10 year rotation and had an MAI of 20 M3, their needs would be met. 1000 ha are by no means a large area to secure the jobs of 150-200 people, and, all of their match splint production is exported. Look at Sagarnath, they already have planted 5500 ha.

The rotation for plywood is longer, because of the need for larger diameter logs. But, again poplar could be used for the core and possibly backs and faces for certain types of plywood- especially where formica type laminate is used for a face. Thus the supply of scarcer desirable face species, such as Terminalia sp. etc, could be stretched out. The silvicultural techniques needed to produce high-quality veneer from fast-growing species such as sissoo, has yet to be developed, but BPF is working on that now. BPF's quota is 400,000 Hft³ (14,000 M³) (3MMBF). A 1000 ha of poplar on a 15 year rotation with 15 M³ MAI would produce (15 M³/ha x 1000 =) 15,000 M³ and they need only cut 67 ha a year!

The paper industry has a multitude of fast growing species to choose from and again not much land is needed. If either Everest Paper Mill or Bhrikuti went on a wood diet here is what they would need.

Table VII Papermill Plantations needed

Tons per day paper production	Bone Dry tons of wood needed per ton of paper	M ³ of wood needed per day	M ³ for 300 days/year	ha @15M ³ /MAI 10 year rotation
10	25	60	18,000	1,200
20	50	120	36,000	2,400
30	75	180	54,000	3,600

* @ 40% bleached yield and specific gravity of 0.42

The whole point being that it is not going to take large areas to satisfy Nepal's forest products industry. What is needed is a mechanism for the industry to obtain these small areas for plantations or these industries will not be able to survive, much less grow. They need the security of the material without excessive transportation costs.

The Lease rules of 1977/78 provided an opportunity for individuals and companies to lease up to 68 ha of forest land for the purpose of growing tees. Obviously, 68 ha will not support an industry. The lease system must be expanded to meet forest industrial needs or there will not be any forest industry and the country will have to import their forest products. The lease should be expanded in terms of thousands of hectares, with a maximum of say 5000 ha.

In addition to the limited area of the present forest lease law, (and probably the reason we did not find any forest products company who had applied for a lease), are these three disincentives:

- 1) the FD can revoke the lease at any time
- 2) and without recourse by the leasor
- 3) the FD can increase the rent on the land at any time and any amount.

Our recommendations are (1) that the lease may not be revoked without due cause, and this can be spelled out (2) that there be a right of appeal through the judicial system, (3) that the rent be tied to some local price or industrial index and (4) that the lease rules be more simple and consistent.

(b) Small Farmer as a Partner to the Forest Products Industry - Philippine Example

A very successful way of contracting with the small FARMER to grow trees was developed by the Paper Industry Corporation of the Philippines (PICOP). The system provided a good way to obtain pulpwood for the company, and provided income to the small farmer and sometimes shade for his coffee. PICOP signed a contract with the small farmer to buy his pulpwood trees at age six for a guaranteed price per cubic meter delivered to the road-side. In order to finance the cost of the seedlings, site preparation, fencing and other establishment costs, the small farmer took the PICOP contract to the local Philippine Agricultural Bank and got a loan. The bank required that the land owner have legal title to the land or that he get legal title. There is no reason this same system could not work in Nepal, especially for the match companies. The same idea has worked for WIMCO in India with a new twist of intercropping and a short rotation using irrigated hybrid poplars.

(c) Forestry Funds Example

In conversation we had with various forest products industry managers we were told that they make an annual reforestation contribution to a reforestation fund in the Forest Department. This fund has just accumulated and nothing has been done with the money. Even though the contributions are small, it is an accepted practice.

The contributions now paid by forest industries to the Forest Department could be converted to a regular assessments based upon consumption of industrial wood. Such contributions would finance a Reforestation Fund independently managed. With the Sagarnath project as a base, such means could build up an industrial growing stock independent of specific wood-using industries

(d) Case of Sal forests

In preparing the catalogue of national forests, the Tarai forests have an important place. They are of higher quality and are more accessible than the Hill forests, but are under more pressure for conversion to cropland. Table I shows their area to be 590,000 hectares of which 215,000 hectares have crown coverage of at least 70 percent. Large, homogeneous blocks with a significant degree of such stocking are suitable for national forest provided they are not already retained as park, hunting or wildlife reserve. The Forest Department will manage them for high quality industrial timber, with due regard for the needs of the local people for other forest products. At present forest industries use principally salvage timber and that resulting from land clearing. As such sources taper off, plantations of fast-growing species will have their place as described above but cannot replace the high-quality timber of the natural forest.

The principal species of the Tarai Forest is Shorea robusta (Sal). Because the sal needs at least 80 years to mature, it is less suitable for plantation, and for private management. Nevertheless the consultants believe that Nepal should retain a significant area of natural sal forest because of the extraordinary quality of the wood, sal seed for extracting oil, and the sal leaves which are extensively used by the people for making plates, roof thatching, native leaf umbrella.

(e) Case of Pine forests

Nepal has 406,00 ha of forest in the chir pine (Pinus roxburghii) type, defined as forest with at least 75 percent coverage by pine. These forests are 8 percent in the middle elevations of the two most western development regions. Forest Department policy does not at present permit their use except for resin, the source of rosin and turpentine. The extraction methods are very destructive to the butt log compared to those formerly used in Southeastern United States. Technical assistance could benefit the industry and the pine forest.

Many of the pine trees are so over-mature that no net growth occurs. Because of Nepal's need for construction lumber, a policy is suggested to harvest such trees and replace them with more vigorous growing stock. The terrain is for the most part so steep that logging must be highly selective in any case.

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Appendix - I

TERMS OF REFERENCE

The experts will produce a report on the potential for greater private sector involvement in the utilization and management of Nepal's forest resource. The report will also include recommended strategies and potential AID involvement to achieve the above. The report will be taken to be a preliminary rather than definitive document and will be shared with the GON.

Specifically, the experts will perform the following tasks:

- A. An analysis of current commercial operations in the forest products industry will be conducted to include identifying the participants, extent of operations, market opportunities, efficiency and effectiveness and potential for private sector participation. Forest products as used herein include, but are not limited to, timber, fuelwood, medicinal plants, wild derivatives, and horticultural products such as orchards and flower seeds. A limited review of world-wide literature on the subject should be undertaken as part of this task.
- B. The policy framework established by the GON will be assessed to determine the degree to which existing policies have negative or positive effects on the growth of this industry, and subsequent opportunities for expansion of the private sector.
- C. Operations of state owned enterprises directly involved in the forest products industry, as well as those firms where the government has equity positions, will be analyzed to determine the effectiveness and efficiency of operations.
- D. A realistic, and practical strategy for obtaining greater private sector participation will be developed. This will include identification of specific desirable policy changes including privatization of parastatals if appropriate and potential AID involvement.

APPENDIX - II

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APPENDIX - III

FORESTRY PRIVATE SECTOR STUDY: OFFICIAL CONTACTS AND
FIELD VISIT ITINERARY

A. KATHMANDU CONTACTS

Wednesday
October 1 1600 Rauno Laitalainen - Team Leader, HMG/ADB/FINIDA
Master Plan for the Forestry Sector.

Thursday
October 2 1530 Roger Nield - Forestry Advisor, Nepal/CIDA
Water and Energy Resources Development Project.

Friday
October 3 1500 ICIMOD - Presentation by K. B. Malla (Director,
National Remote Sensing Centre) et.al.

Sunday
October 5 1100 Indra Man Nakarmi, Project Chief, Forest
Products Development Board.
1500 Asfaq Sheak, Manager, Herbs Production &
Processing Co.
1800 M. B. Thapa, Chairman of the Forest Industries
Association; E. J. B. Rana (ex-Secretary,
Ministry of Forest & Soil Conservation) and
Batuk Upadhyia (RD).

Monday
October 6 1100 Manzoorul Haque, Chief Conservator of Forests
1500 S. P. Regmi, General Manager, Fuelwood
Corporation of Nepal.

Tuesday
October 7 1100 Baban P. Kayastha, Chief, Community Forestry &
Afforestation Division.
1930 Dinner chez Taylor with Chief Conservator Haque
and B. Upadhyia (RD).

Wednesday
October 8 1500 Bishwa Man Shrestha, Chairman, NIDC.
1930 Dinner chez Bhatta with B. Upadhyia (RD).

Thursday
October 9 1100 Gobind Ram Bhakta Mathema, General Manager,
Timber Corporation of Nepal.
1500 Surya Nath Upadhyay, Executive Director
(Legal), Water and Energy Commission.

Monday
November 10 David Reed, John DeBoer, Agriculture Research
and Production/Winrock.

Tuesday
November 11 Andy Geair, Deputy Resident
Representative, UNDP.
Patrick Robinson, Peter Heffron, Nepal-U.K.
Forestry Research Project.
Michael Wallace, Food and Agriculture Sector
Project/Winrock.

Wednesday
November 12 Dick Woodford, Resident Representative,
World Bank.
T. B. S. Mahat, ICIMOD.

Tuesday
November 18 Ambassador Weil, Lewis Macfarlane, Counselor
of Embassy, David M. Wilson, Director,
USAID/Nepal, Charles T. Hash, Agricultural
Development Officer, ARC/USAID/Nepal.

Monday
November 24 PM Peter Indergand, Swedish Match Representative
in Nepal. Ozzie Bender, Henry Kernan, Balram
Bhatta.

W. Wonder, CTA, Terai Forestry Project.

Tuesday
November 25 AM Chief Conservator M. Haque, Ministry of Forest
and Soil Conservation
Attendees: Ozzie Bender, Henry Kernan
Balram Bhatta, Charles T. Hash
Josette Maxwell

Wednesday
November 26 Kevin White, Plantation Consultant for
Sagarnath, UNDP.

B. FIELD TRIP CONTACTS

Wednesday October 22	Dhangadi	Naresh Thapa, District Forest Controller, Kailali District.
Thursday October 23	Budetola	K. P. Ojha, District Forest Controller, Dandeldhura District.
	Sahajpur	R. L. Sharma & H. N. Yadav, Supervisors, Laxmi Resin Tapping Industries.
Friday October 24	Dhangadi	B. Sharma, Sawmill Operator, Mahakali Kasta Uddyog, Dhangadi.
	Attariya	K. Vasili (Chief Engineer), M. F. Azam (Processing Technologist) & L. B. Yadav (Chemist), HMG/USSR Rosin & Turpentine Factory, Attariya
	Geta	B. B. Garg, Manager, Western Nepal Kasta Uddyog (Match Splints Factory).
	Geta	B. K. Bothra, Manager, Gyan Industries Ltd./Dugar Group.(Sal Seed Oil Industry).
Saturday October 25	Laljhadi	J. N. Sharma, Depot Incharge, T.C.N. Sawmills and Sales Depot, Laljhadi, Kanchanpur.
Sunday October 26	Geta	K. C. Jain, Board Director, Laxmi Kathha Factory.
Monday October 27	Hetauda	D. S. Rana, General Manager, Nemoparquet Company, Hetauda Industrial District.
	Hetauda	M. Singh, Acting Manager, T.C.N. Sawmills, Hetauda.
	Jyamire	G. Shrestha, Extension Agroforester, CARE/SFDP Agroforestry Project, Jyamire, Makwanpur District.
	Jyamire	R. C. Bartola, Private farm owner & tree planter.
	Hetauda	Mr. Paudel, Forest Officer, Terai Community Forestry Project.

Wednesday
October 29

Sagarnath T. N. Bhattarai, Project Manager,
Sagarnath Forestry Development
Project.
Mahendranagar V. K. Jain (Chief Engineer), S. H.
Jaha (Pulpmill incharge) & R. P.
Sarraf (Director), Everest Paper
Mills, Mahendranagar, Dhanusha
District.

Thursday
October 30

Biratnagar G. Mathema, District Forest
Controller, Morang District.
Biratnagar B. M. Shrestha, General Manager,
The Juddha Match Factory,
Biratnagar.
Biratnagar B. M. Joshi, General Manager, Nepal
Bobbin and Plywood Factory,
Biratnagar.
Biratnagar O. Dhanawat, Manager, Dhanawat
Match Factory and Ganesh Bidī
Factory, Biratnagar.
Duhbi K. L. Dugar, Director, Nepal
Strawboard Factory, Duhbi.

Friday
October 31

Betauna, Babiya
Birta Panchayat K. L. Dugar, Owner, Gyan Uddyan, a
modern agri-fruit orchard and
seedling farm.
Rangeli Mr. Baral, Attached Forest Officer,
Morang District Forest Office.
Kadamaha D. Misra, Headmaster, Higher
Secondary School, Kadmaha, Morang
District.
Charali K. Sharma, Supervisor, Durga Veneer
and Teachest Industries, Charali,
Jhapa District.
Charali Mr. Giri, Owner, Giri Bandu Tea
Estate.

Wednesday
November 5

AM Narayanghat - G. Mathema, Procurement Officer
B. H. Rajbhandari, Production Manager Bhrikuti
Papermills, Gaidakot.
PM Butwal - D. R. Shakya, Act. District Forest
Controller, Rupandehi District.

Thursday
November 6 AM Butwal - P. L. Lindgren, Swedish Forester,
P. L. Shrestha, General Manager
L. Devkota, Maintenance Chief, Butwal Plywood
Pvt. Ltd., Trevor Duston - D.C.S. Director,
United Mission.
Y. P. Pradhan, Chairman, K. Pradhan, General
Manager, Tinau Kastha Seasoning Udhyog Pvt.
Ltd. Butwal.
Bhairahawa - M. P. Joshi, Managing Director,
C. B. Karki, Accountant Lumbini Salai Udhyog,
Pvt. Ltd. Bhairahawa.

Saturday
November 8 Gorkha -J. Davenport, Engineer RCUP
S. B. Adhikari, District Forest Contractor
R. Lamichane, Extension Officer, N. Chitrakar,
Financial Officer RCUP, Darundi Watershed
Project Gorkha.
Nareswor Village Panchayat Ward No.
P. L. Tiwari, Naike Panchayat Nursery.

Sunday
November 9 AM Taksar - G. Upadhyaya, Project Manager RCUP,
Darundi Watershed Project
B. Basnet, Ranger
K. B. Adhikari, Private Plantation Manager
Gorkha - Gilles Ponso, General Manager
G. Dhital, Gorkha Aurvedic Co. Pvt. Ltd.
N. Berref, President CIDR France.

C. FORESTRY PRIVATE SECTOR STUDY: FIELD VISIT ITINERARY

Tuesday
October 14 AM Kathmandu-Nagarkot-Kathmandu to visit Hill
Community Forestry Development Project Nursery
& Plantation sites. (Kernan, Bender, Maxwell,
Bhatta).

Wednesday
October 15 1000 Don Gilmour, Nepal-Australia Forestry Project.

Thursday
October 16 0830 Depart Kathmandu for Chautara: Nepal Australia
Forestry Project (NAFP) (Kernan, Bender,
Maxwell) 1200 arrive Chautara. Visit NAFP.
Overnight in Chautara (NAFP guest house).

Friday
October 17 AM Continue visit to NAFP.
PM Return to Kathmandu

Wednesday
October 22 1200 Kathmandu - Dhangadhi (RA 305) (Kernan, Bender,
Bhatta, Maxwell, Taylor)
1400 arrive Dhangadhi
Meet forestry officials and visit sawmill
industries.

Thursday
October 23 Dhangadhi - visit matchstick factory, sal seed
oil industry, katha industry, and
rosin/turpentine factory.

Friday
October 24 AM Dhangadhi - drive up Dandeldhura road to visit
Chir pine forest, observe tapping, natural sal/
mixed hardwoods/pine forests. Discussions
with local officials re: forest product trade
with India.
PM To Kanchanpur to observe illegal forest
encroachment problems.

Saturday
October 25 1355 Dhangadhi - Kanchanpur District forest area
encroachment study visit to T.C.N. Sawmills and
logyards.

Sunday
October 26 Dhangadi - Returned to Kathmandu.

Monday
October 27 0700 depart Kathmandu for Hetauda by road (via Daman)
Visit Herb Farm and Herb Production &
Processing Co. chir pine taping operations en
route.
1400 arrive Hetauda. Visit sawmill.

Tuesday
October 28 AM Hetauda: Terai Community Forestry Project,
Timber Corporation of Nepal, forest industries-
Nemoparquet, Institute of Forestry, IDRC Farm
Forestry Project.
PM Drive to Sagarnath visiting 1-2 Terai Community
Forestry project sites and Tamagarhi taungya
plantations enroute. (Overnight at Sagarnath).

Wednesday
October 29 AM Visit Sagarnath Plantation Project -
departmental planting and agri-silviculture
plantations, timber harvesting and sawmill.
PM drive from Sagarnath to Biratnagar.

Thursday
October 30 AM Visit forest industries - plywood, matches
veneer and tea chest industries.
PM Visit forest industries and/or Terai Community
Forestry project sites. Discussions with
forestry officials.

Friday
October 31 AM Visit Forest Product Development Board / Tea
Development Corporation plantations (Ratuwamai).
Tihar begins Overnight in Biratnagar.

Saturday
November 1 1435 Biratnagar to Kathmandu (RA 104).
1530 arrive Kathmandu.

Tuesday
November 4 0700 Depart Kathmandu for Bharatpur via Mugling
(Kernan, Bender, Bhatta, Maxwell).
1300 arrive Bharatpur. Visit Brikuti Paper Mill.
Overnight USAID Guesthouse/Bharatpur.

Wednesday
November 5 AM Continue visit to Paper Mill.
PM drive from Bharatpur to Butwal. Overnight
Butwal.

Thursday
November 6 AM Visit Butwal Plywood Factory, sawmills, private
briquettee factory.
PM Meeting with United Mission to Nepal (UMN)
technical staff and forestry officials.

Friday
November 7 AM depart Butwal for Gorkha via Bharatpur/Mugling.
PM arrive Gorkha. Discussion with forestry and
other local officials. Overnight Hotel Bisauni.

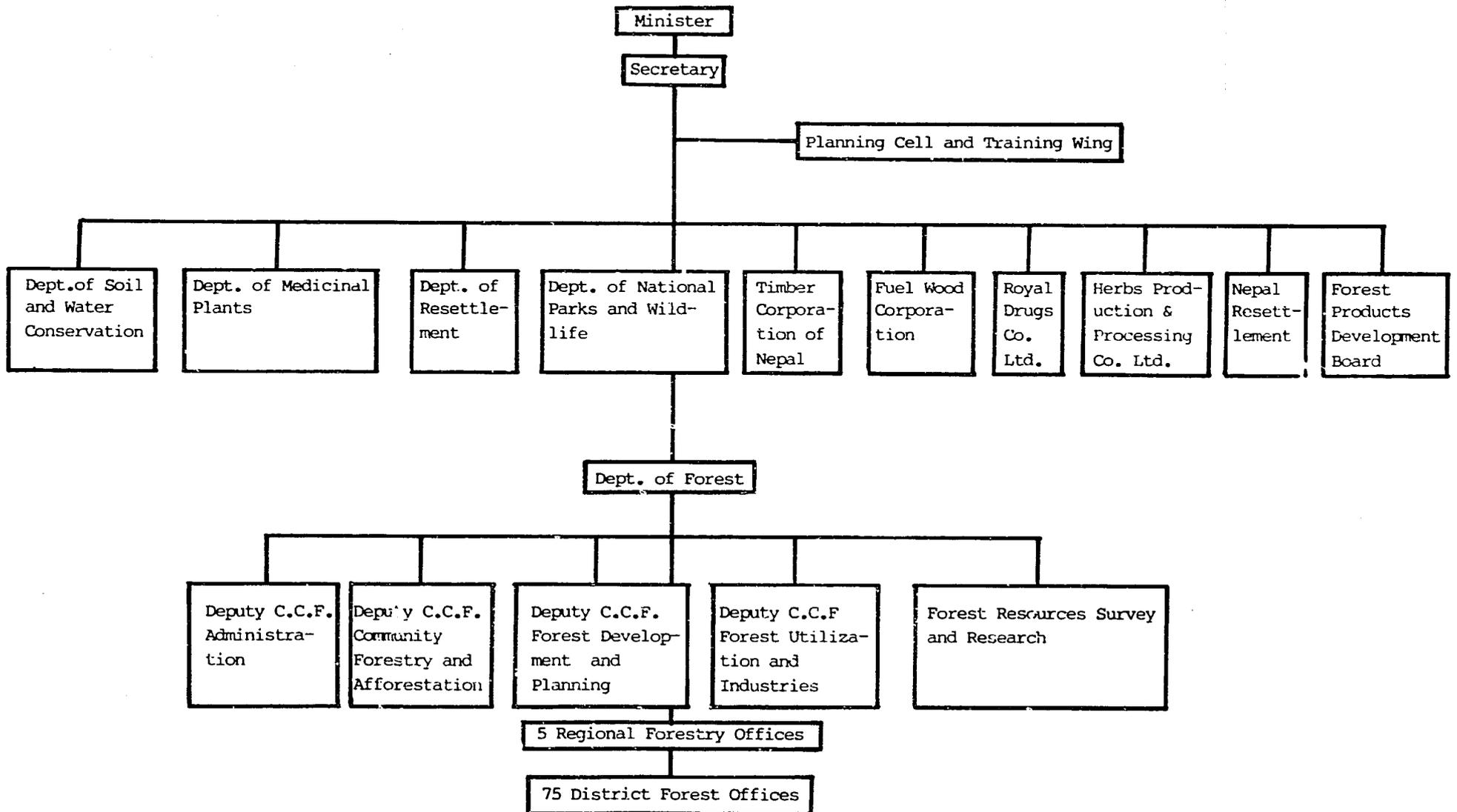
Saturday
November 8 Gorkha Bazar-Gorkha Durbar-Nareshwar-Gorkha
Bazar. Visit RCUP field sites (community
forest plantations, Nareshwar nursery, natural
sal regeneration, napier grass plantings etc.)
with Catchment Conservation Officer Gopal
Upadhy and/or DFC Baral. Overnight in Gorkha.

Sunday
November 9 AM Visit paired watershed study site, local
farmers (to discuss fuelwood/fodder tree &
grass plantations), and private medicinal/herb
production plant (Gorkha Ayurvedic Company
Pvt. Ltd.).
1300 depart Gorkha for Kathmandu.
1800 arrive Kathmandu.

Appendix - IV

Ministry of Forests & Soil Conservation

Organization Chart



APPENDIX V

Summary of Forest Personnel

<u>Type of Personnel</u>	<u>Number of Authorized Posts</u>	<u>Post Filled</u>	<u>Posts Vacant</u>
Forestry Professionals	245	191	54
Forestry Subprofessionals	1,862	1,123	739
Non-Armed Forest Guards	1,998	1,998	0
Armed Forest Guards	839	750 (est)	89
Office Support Staffs	1,339	1,055	284
TOTALS	6,283 =====	5,117 =====	1,166 =====

Source: Forest Department

Appendix VI

DETAILS OF THE FOREST PRODUCTS INDUSTRY

Below are listed most of the forest products industries in Nepal. These have been discussed as shown below:-

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1. LOGGING COMPANIES

In Nepal, there are no logging companies, only contractors of felling, bucking, and yarding. Usually a transport company is contracted to haul the logs or the forest products company has its own trucks for hauling.

2. SAWMILLING INDUSTRY

Sawmilling is one of the oldest and most important forest based industries in Nepal. But it has never been given its due place, in fact, a biased and step-motherly attitude towards private sawmills seems prevalent. The main reasons causing this attitude are first, the monopoly and out of way favours bestowed upon TCN sawmills. The private sawmills are never given a chance to develop and carry on their business properly. Secondly, in the past the sawmills were just converting round wood into cants or (just to change flitches changing the form of the log) and exporting to India, and not producing the required sizes of lumber needed by the local market. Because of these reasons quotas allocated to sawmills (about 12) were - disallowed, and the Forest Ministry refuses to provide any help and to accept sawmilling as a forest based industry.

Now the policy has changed. The export of logs and lumber to India have been stopped since six years, though in the four Western most Districts of Kanchanpur, Kailali, Banke and Bardia, the export to India was opened for the last two years because of large stocks of logs and sawn timber which could not be transported to other parts of Nepal. HMG policy is not to export any logs, lumber and firewood, but to meet the demands within the country. The sawmills would rapidly reopen when the export would be opened and then die back as the export would be stopped. Thus with the export decisions of HMG, the sawmills live and die, this is their fate. There are some sawmills struggling for life, trying to live, but it is very difficult for them to get the logs. There is no set system or way to procure logs. Logs can not be bought from private people even if they own trees. Though no law forbids selling of privately owned logs and buying of those logs by anyone. The Forest Department does not sell any logs to the sawmills; the TCN and FPDB may or may not sell logs and the sale permits may have to be obtained from Kathmandu. Sometime if there is auction of old and degraded logs by TCN or FPDB the sawmills may buy these logs. Infact, it is a surprise, not that the sawmills are closed but that sawmills are still running and that they are still there in spite of the various obstacles, difficulties and uncertainty - and unavailability of logs.

Whether any one likes it or not, sawmilling is an important industry, and it has an important role of supplying the sawn timber requirements of the country. How else can the sawn timber demand be met without importing and spending foreign exchange?

The Forest Department provides logs on a royalty basis every year to the TCN where the TCN is operating. TCN sawmills may have to go a little longer distances to collect the logs, but they are never short of logs for running their sawmills. Only 40.5% of the T.C.N. sawmills are operating. The closure of the mills seems mainly due to lack of proper management and maintenance.

(a) STATUS OF PRIVATELY OWNED SAWMILLS

Estimated no. of sawmills - over 200

Kailali Districts has - 60 sawmills - 9 running

Kanchanpur district has - 41 sawmills - 3 running

In those 2 districts with 101 sawmills only 12 are running. Thus only 11.9% of the privately owned sawmills are in operation now. There is no system or set method by which these private sawmills will be able to get logs from Forest Dept. or TCN or FPDB - the log providing agencies. Private sawmills seem to be closed mainly due to nonavailability of logs.

(b) SAWN TIMBER PRODUCTION

There are no statistics of the volume of sawn timber on the Nepal market, nor any figure on how much is produced or illegally exported to India.

It is known that TCN's average production figures for 3 years, 11 months, 1982/85 of are around 813,409 true cubic feet of sawn timber (23,036 M3).

TCN sold an average of 459,484 Hft3 of logs (16,563 M3) and FPDB sold an average 1,155,567 Hft3 of logs (41,655 M3), during 3 years, 8 months (1982/86). Presumably these log sales went to sawmills and sawn timber was produced. Therefore:

	Ft3	M3
TCN SAWMILLS	813,409	23,036
TCN LOGS CONVERTED		
@ 47% Recovery	585,087	16,570
against true cubic		
FPDB LOG CONVERTED		
@ 47% Recovery	691,605	19,567
against true cubic		
TOTAL	2,090,101	59,173

3. VENEER MILLS (Tea Chest Industry)

(a) Description:

There are 8 mills making veneer for tea chests (a tea chest is a utility type 2 foot cube box usually used for shipping tea). The outside of which is made of veneer-usually 1.5-2.5 mm in thickness. The veneer is attached to a frame of 3/4"-1" lumber and then lined with lead or aluminium foil. The industry is new to Nepal, the first plant having started about 3 years ago. Certain districts in eastern Nepal were declared as "Tea Development Areas" and many incentives and facilities were announced by HMG for tea growers. A good business is underway in tea chests which has encouraged the establishment of veneer and tea chest industries. Most of these mills consist of one or more 48" lathes for peeling and rudimentary trimming equipment. There is no splicing or patching and therefore the operations generate a lot of waste. The veneer is sun dried outside, like laundry. It is very labor intensive. Multiple species are used - some of the more prevalent ones are:

Tooni	<u>Toona ciliata</u>
Lampate	<u>Duabanga grandiflora</u>
Chilaune	<u>Schima wallichii</u>
Bahera	<u>Terminalia belerica</u>

They make 7 different grades and peel to a 4" core. Cores are used or sold for firewood.

(b) Raw material Base and production:

Eight of these mills have agreements with the FD for allotting 3 year quotas. The total volume of wood annually allotted is 690,000 Hft³ (24,884 m³).

Production by district is as follows:

<u>Development Region</u>	<u>District</u>	<u>Percent of quota</u>	<u>Mills</u>
East	Jhapa	25 %	4
Mid-West	Nepalgunj	43 %	2
East	Itahari-Morang	12 %	1
West	Nawal Parasi	20 %	<u>1</u>
			<u>8</u>

Markets:

All of the veneer production is now being exported to India where the veneer is used for making tea chests and other products.

Ownership:

All of these mills are privately owned.

4. PLYWOOD AND BLOCKBOARD

(a) Description:

There are 2 plywood mills in Nepal. One is in Biratnagar, Eastern Region and the other in Butwal, the Western Region. They both have quota agreements with the Forest Department. Their products are interior hardwood decorative plywood, used for panelling and furniture. Some is used in outside construction. The Butwal Plywood Factory also makes a block board panel (small pieces of 1" thick lumber are glued between two thin sheets of plywood).

(b) Raw Material Base and Production:

	<u>Quota</u>	<u>Actual Use</u>
Butwal Plywood Factory Pvt Ltd (started in 1973)	400,000 Hft3 (14,425 M3)	125,000 Hft3 (4,500 M3)
Nepal Plywood Co.Ltd. (started in 1961)	100,000 Hft3 (3600 M3)	100,000 Hft3 (3,600 M3)
TOTAL	500,000 Hft3 (18,025 M3)	225,000 Hft3 (8,100 M3)

Both of these mills are inefficient - both have very old and patched up equipment. Although Nepal Plywood has recently purchased a new Italian Cremona lathe for 2.2 million NRs (US \$100,000). Unfortunately the veneer drying capacity will still limit the production.

Principal Species Used:

Butwal Plywood	Nepal Plywood
Asna (<u>Terminalia tomentosa</u>)	Lampate (<u>Duabanga grandiflora</u>)
Karma (<u>Adina cordifolia</u>)	Bahero (<u>Terminalia belerica</u>)
Jhingan (<u>Lannea coromandelica</u>)	Asna (<u>Terminalia tomentosa</u>)
	Jhingen (<u>Lannea coromandelica</u>)

Recovery is only 30% at Butwal Plywood. Nepal claims to have recovery of 47% (60% on Hft3).

TABLE - PRODUCTION HISTORY

Annual capacity	1981/82	1982/83	1983/84	1984/85	3 yr. 9 mo. average
ft ² 6,642,000	2,306,000	1,585,000	2,541,000	1,286,000	2,058,133
m ² (617,286)	(214,312)	(147,304)	(236,152)	(119,516)	(191,263)
production % to licensed capacity					
(100 %)	35	24	38	19	31

The production in the best year was only 38 % of rated capacity with the average for 3.75 years being 31 % or less than one third.

(c) Markets:

The combined production of both mills have an estimated 30 % of the Nepal market. The balance of Plywood consumed is imported from India. India's plywood is considered superior because of a smoother surface and better bonding. Nepal Plywood has a reputation of delaminating.

TABLE - PROJECTED DEMAND
0 000ft²
(M²)

	1986	1990	1995	2000
Projected Demand	11,113 (1,033)	13,507 (1,255)	17,237 (1,602)	21,988 (2,643)
Domestic production of 31% of capacity	2,058 (191)	2,058 (191)	2,058 (191)	2,058 (191)
Shortfall	9,055 (842)	11,449 (1,064)	15,179 (1,411)	19,930 (1,852)
% of total	(81%)	(85%)	(88%)	(91%)

The annual increase of plywood consumption is estimated to be 5 percent per year. If the 2 plywood mills cannot increase their production, by the year 2000 they will have less than 10% of the market. Most of the imported plywood that makes up the difference comes from India.

(a) Ownership:

Nepal Plywood is 100% private. Butwal Plywood is a private limited company with the United Missions of Nepal and its other companies owning about 68% of the shares and two government entities owning 32%. The chairman of the board is from NIDC.

5. Wood Seasoning Industries

(b) Description

These companies are Sawmills with dry kilns. There are 4 in Nepal which have quotas from the F.D. At least one of these (Tinau Wood Seasoning) also has a furniture plant integrated into its operation.

(c) Raw Materials and Production

The total annual quota from the F.D. is 310,000 (11,179 M3) (2.5 MMBF) they are located in the following regions and towns.

FWDR	MWDR	WDR	CDR	EDR
0	0	1	3	0
		Butwal	Bharatpur	
			Bara	
			Hetauda	

(c) Market

All production is sold in Nepal.

(d) Ownership

All are privately owned.

(e) Problems:

Capacity of plant visited - Tinau Wood Seasoning 80,000 Hft3 of logs. Quota only 50,000 Hft3 and sawmill recovery 50-60% of quota or 25,000 - 30,000 ft3 of lumber.

6. Flooring plants

(a) Description:

There is one parquet flooring plant in Nepal located in the CDR, in the town of Hetauda, called Nemo Parquet Company. They have their own sawmill and dry kiln for preparing the lumber to make the parquet. They also have a small custom furniture plant adjacent to the parquet production line. The parquet flooring was started about 7 or 8 years ago by a German, Herbert Heinz, who was an experienced parquet man.

(b) Raw Material & Production

The company has a quota from the FD of 50,000 Hft³ (1800M³). They are only using 40% of their quota or 20,000 Hft³. They use mainly laurel or asna (Terminalia tomentosa), and some sissoo (Dalbergia sissoo).

The recovery is 15 square feet of 8mm parquet per Hft³ of round log. Their annual production capacity is 432,000 Sq.Ft. but they are only producing 40 % of that or 173,000 Sq.Ft.

(c) Market

About 70% of the production is sold to India and 30% in Nepal.

(d) Ownership

Nemo Parquet Company (P) Ltd. is a privately owned company.

7. Furniture factories

(a) Description:

In Nepal wooden furniture constitutes about 69% of the market - steel 27% and bamboo cane 4 %. There are hundreds of registered wooden furniture plants scattered throughout the country. They range from one man shops to modern plants with joinery, mechanical equipment, and assembly line production. Here we are concerned with only those furniture plants that have their own sawmills and quotas from the FD. The others presumably purchase lumber direct from sawmills or timber merchants.

(b) Raw Material and Production

There are 3 furniture companies that have agreements with the FD for annual quotas. Their total is 65,000 Hft³ (2,344 M³/(517 MBF)).

There are no statistics on production - but the latest figures available for annual expenditure for furniture in the Kathmandu valley for a 5 year average 1980-85 was over 13 million Rs (close to US \$600,000).

Market

The main market is Kathmandu valley and the other large urban areas. The rural population uses significantly less furniture than do the city dwellers.

Furniture is imported from India mainly for the Terai, but no figures are available as to what percent of the market the Indian's have.

Ownership

Almost all furniture plants are privately owned, individually or private limited companies. The Department of Village and Cottage Industries has a furniture demonstration and training program.

8. Match Factories

(a) Description

The match industry is one of the most important forest products industries in Nepal and also one of the oldest. It is a good source of revenue for the HMG. Besides the royalty collected by the FD, the Finance Department collects an excise tax on every box of matches produced. There are 15 match companies in Nepal, 9 of which have quotas from the FD.

Some of the match companies make waxed paper matches, and are not dependent on wood. Some import boxes and even splints (sticks) from India. (Nepal also exports splints to India). Some import splints only, making the boxes in Nepal. There are even some match companies registered with the Department of Village and Cottage Industries who do not have a factory - they just buy splints and boxes from others and put their own label on and market under their own name.

Many of these match factories have very old equipment. The recovery factor is high - about 60%. Most of the waste is used or sold for fuel. It is difficult to measure the production as some factories just make splints, other turn out complete boxes of matches. One Hft3 of roundwood will produce 4 grosses of match boxes (1 gross = 144 boxes).

(a) Raw material and Production

The 9 match companies annual quotas from the FD total 882,500 Hft³ (31,823 M³). These plants are located in the following regions and towns:

	FWDR	MWDR	WDR	CDR	EDR
	1	1	1	1	5
	Dhangadi	Nepalgunj	Siddharthanagar	Birgunj	Biratnagar
% of total quota	64	6	5	6	19

The principal species being used are Simal (Bombax malabaricum, B. Ceiba) and Gutel (Trewia nudiflora).

(c) Markets

Most of the match production is sold in Nepal except the large plant in Dhangadhi which exports its entire production of splints to India (64% of the total wood quota for the match industry).

(d) Ownership

All the match factories are privately owned but 1. The Lumbini match company is owned by Salt Trading Co and its subsidiaries in which HMG has 50% interest, but the management is from the private sector.

9. Extractive Plants

There are several extractive products derived from trees on which industries have been built. They are:

Kathha

Rosin and turpentine

Sal seed oil

i) Kathha Industry

(a) Description

Kathha is a pottery clay colored crystalline substance extracted from the heartwood of the Khair tree (Acacia catechu).

Kathha is used in the preparation of "paan". Fresh leaves from a vine (Piper betle) are coated with edible white lime paste and then the Kathha paste is spread over the lime. Kathha on contact with the lime, turns brilliant red. On top of this, all kinds of spices and sometimes tobacco are added; then the leaf is folded into a small triangle and sold to the "chewer". (Each "paan" is made to order for the buyer, who stipulates what spices etc. he wants. "Paan" chewers would be equivalent to tobacco chewers in the United States. It is considered a stimulant especially if betal nut (Areca Catechu) is added and can be addictive. "Paan" is popular in other parts of Asia and Africa.

A by-product of the manufacture of Kathha is "cutch" which is used in tanning, dying, as an astringent (medical) and as a lubricant in oil well drilling.

There are two types of Kathha enterprises:

- (1) modern mills licensed and registered by the Department of Industries and
- (2) crude country "handi" or "desi Kathha" type mills licensed by the Department of Village and Cottage Industries. Production of this latter type use huge amounts of firewood, and produce a low yield and poor quality Kathha. The present HMG policy is one of not renewing any licenses, and not providing any more quotas after expiration of present licenses. These "desi Kathha" operations are mainly in the hills and do great damage to the hill forests. Some of these licenses have expired and others will be ending this year.

(b) Raw material and Production

The annual quota of the 2 types of Kathha industries are:

No.		Hft3	(M3)	(%)
5	Modern Plants	736,000	(26,540)	(79)
7	"Desi Kathha"	<u>197,600</u>	<u>(7,125)</u>	<u>(21)</u>
		933,600	(33,666)	(100)

The modern plants are located in the following region and towns:

	FWDR	MWDR	WDR	CDR	EDR
	1	2	0	2	0
	Dhangadhi	Nepalgunj		Birgunj Parwanipur	
% of total Quota	41	49		10	

(c) Markets

Kathha - only a small amount is consumed in Nepal, most is exported to India, Bangladesh, Pakistan, and Sri Lanka.

Cutch - practically no cutch is consumed in Nepal. Most is exported to the same countries as kathha and some to Europe.

(d) Ownership

All of the Kathha plants are privately owned.

ii) ROSIN AND TURPENTINE INDUSTRY

(a) Description:

In Nepal, rosin and turpentine are derived from resin which is bled from chir pine (Pinus roxburghii). The resin is brought to a factory where it is melted, filtered, the water and waste extracted, then boiled to produce rosin, and the turpentine distilled. The tapping season is 8 months, from March thru October - the warmer months of the year.

(b) Raw Material and Production

Chir pine grows mostly in the Middle Mountains between 900 - 2100 meters (3000 - 7000 feet). It is also found in the Siwaliks between 600 - 1100 meters (2000 - 3500 feet). It resembles the Ponderosa pine of North America. In the upper areas it is found in pure stands or mixed with oaks and Rhododendrons. At its lower limits, it can be found with sal (Shorea robusta) and Tanki or Koiralo (Bauhinia species).

Chir pine occurs in the Far Western, Mid Western and Western Development Regions and much less in the Central and Eastern Development Regions. According to the Land Resource Mapping Project, there are 406,000 ha of Chir pine forests. (Chir pine forest type is defined as having about 75% crown cover of pine). About 85% of the Chir pine forest is found in the FWDR and MDR. Elevation wise, 68% is found in the country's Middle Mountains.

TABLE 5

CHIR PINE FOREST DISTRIBUTION
(000 ha.)

	TOTAL	FWDR	MWDR	WDR	CDR	EDR
High Mountain	40.6 (10.0)	9.7 (2.4)	26.4 (6.5)	1.6 (0.4)	2.4 (0.6)	0.4 (0.1)
Middle mountain	327.0 (80.6)	112.4 (27.7)	163.5 (40.3)	16.6 (4.1)	24.3 (6.0)	10.1 (2.5)
Siwaliks	38.1 (9.4)	17.5 (4.3)	20.7 (5.1)	- -	- -	- -
Total	405.7 (100.0)	139.6 (34.4)	210.6 (51.9)	18.2 (4.5)	26.7 (6.6)	10.5 (2.6)
Percent believed tappable in (%)		40	20	20	40	20
in (000) ha	183.6	55.8	42.1	3.6	10.7	2.1
est. poten. prodn. MT	14,121	6,894	5,201	445	1,322	259

Location and Capacity of the Extraction Plants

	FWDR	MW+W+C	C	TOTAL (tons)
Company location	FPDB plant at ATTARIYA, KAILALI	LAXMI ROSIN & TURPENTINE (PVT.) LTD. at NEPALGUNJ (1990)	HERBS PRODN. & PROCESSING CO. LTD. at KATHMANDU	
ROSIN	2800	2985	120	5905
TURPENTINE	625	665	20	1310
RESIN NEEDED	3750	4000	160	7910

(c) Markets:

Rosin and turpentine are used by a number of industries such as paper, adhesives, paints, varnishes, printing inks, surface coatings, textiles, rubber, chemical, soap and sporting goods. In Nepal the following industries are users or potential users of resin.

INDUSTRY	NO.	TONS PRODN.	% ROSIN USED	REQUIRED AMT. OF ROSIN
Soap	4	10,450	5-10	783
Paper	3	6,000	4-5	300
Paint/Varnish	4	1,700	8-12	170
Tyre retreating				30
Mask making				<u>10</u>
				1143

The current prices of rosin and turpentine are 16.5 and 19.5 Rps./Kg. respectively. (US\$ 910/MT rosin and US\$ 767/MT turpentine).

The value can be calculated as follows:

Millions

If the production rate is 5905 MT of rosin @ 19,500 =	Rps	(US \$)
and 1310 MT of turpentine @ 16,500 =	115.1	(5.4)
	21.6	(1.0)
	<u>136.7</u>	<u>(6.4)</u>

(d) Ownership:

The FPDB plant is a government owned enterprise. It has used 50 tons of resin in a production trial and has now agreed with LAXMI Tapping Industry Pvt. Ltd. to purchase resin at 15.5 Rps./Kg. Beginning in 1987 the plant is scheduled to use 3750 MT of resin.

Laxmi Rosin and Turpentine (pvt.) Ltd. is privately owned and will start resin tapping next season (March 1987).

Herb Production & Processing Co. Ltd. is a government company.

iii) Sal Seed Oil Industries

(a) Description:

Sal Seed oil is extracted from the seed of the sal tree (Shorea robusta). A by product of the extraction process is sal seed de-oiled cake. The oil is greenish brown in color and has a glyceride composition which enables its use after fractionation as a cocoa butter extender used in chocolate. The oil is also used in the manufacture of soaps, paints, varnishes, hair oil, lubricants and pharmaceuticals. The de-oiled cake is used for animal feed and fertilizer or burned as fuel (it has a high calorific value, 60 -70 % of coal). The ratio of oil to oil cake is about 1:9 the price ratio is 22:1 for soap grade oil and 40:1 for edible grade.

(b) Raw Material and Production

There are 7 extraction plants in Nepal extracting oils from rice bran, boiled rice, mustard seed and sal seed.

Four of these 7 plants have agreements with the FD for sal seed. About 26,000 tons of sal seed is allocated to these 4 plants on an annual basis. The sal tree produces heavy volumes of seed every other year. Freshness of seed is crucial as the older the seed, the lower the quantity and quality of the oil produced. The seed has to be collected and delivered to the plants within 3 weeks of dropping from the trees. A massive effort is put forth during the seed harvest. Industry sources claim 100,000 people are engaged in this harvest and bring an estimated 15 million Rps. of income to the collectors. Fortunately the harvest is in May/June just before the monsoons and at a time when the farmers are idle.

The location of the plants are in the following regions and towns.

FWDR	MWDR	WDR	CDR	EDR
1 Dhangadhi	-	-	1 Parwanipur	2 Biratnagar Jhapa

The production has been (estimated according to industry sources):

	1983/84	1984/85	1985/86 9 months
Sal Seed Oil - Kilo litres	200	1000	100
De-oiled cake - M tons	1500	8000	1000

(c) Markets

Almost all of the sal seed oil is exported. Much goes to India, and the highest quality to Japan and Europe to be used in the making of chocolate.

Almost all of the de-oiled cake is exported to India.

(d) Ownership

All of the solvent plants are privately owned.

10. Paper Mills

(a) Description

There are two kinds of paper industries in Nepal. One is "LOKTA" the hand made paper with about 42 registered private companies and organizations, using about 600 Mtons of Lokta/Kagat Pate (Daphne bhlua and Daphne papyracea) for making paper every year. About 50% is consumed in Nepal, the rest is exported to Japan and Europe.

The machine made or conventional paper industry has 2 printing and writing paper mills and 1 straw board mill and one waste paper mill in Kathmandu. Paper consumption in Nepal is extremely low. The estimated per capita consumption is less than 0.9 Kg., lower than Bangladesh (1 Kg) and Bhutan (2 Kg).

(b) Raw Material and Production

Printing and Writing (P&W) Paper Mills :

HMG considers P&W paper one of the most essential commodities and is within the 5 priorities set by HMG. There are two recently completed new mills in Nepal making P&W papers. Both located in the CDR.

NAME	LOCATION	CAPACITY TON/DAY	ACTUAL PRODN.
Bhrikuti Paper Mills (Started May 1986)	Gaindakot Nawalparasi	10	7
Everest Paper Mills Pvt. Ltd.(started July 1986)	Mahendranagar Dhanusha	30	8-9

Everest Paper Mills is set up at the cost of Rs. 40.96 million. They are using 20% wheat and rice straw and 80% imported waste paper (from Calcutta). Bhrikuti is using 45% wheat straw, 45% sabai grass (Eulaliopsis binata) and 10% waste paper (from Kathmandu).

The Everest mills claim a 40% bleached yield on 70 brightness paper. Bhrikuti is only getting a 33% on 76 Brightness. The sabai grass has an exceptional fiber being 3-6 mm in length, nearly twice that of wheat or rice straw and equal to the better coniferous fibers. It is a wild grass that grows principally in the hill country on slopes difficult for grazing (and harvesting). It is used by the rural people for rope making and thatching. Bhrikuti mills is considering trying to cultivate sabai grass on FD land or get private people to grow it.

Everest Paper Mill seemed to be operating from hand to mouth. At the time of our visit, they were only operating 12 hours per day due to a lack of straw.

(c) Market

The two mills combined can supply about 42% of paper against a present demand estimated of 11,000 tons per year. About 52% of the demand is imported from India under a quota system and the remaining 6% is imported from China, Bangladesh and Korea under import licence from the Department of Commerce.

The imported P&W paper is fetching 23,000 - 24,000 Rps./ton whereas Everest is selling for 18,400 and Bhrikuti for 20,000 Rps./ton. Prices for the imported paper of this weight are at least \$ 100/more a ton than in the USA, and not as good quality.

PROJECTED DEMAND AND SUPPLY

Printing & Writing Grade Paper

Year	1986	1990	1995	2000
Projected Demand	10,700	14,900	22,600	34,300
Nepal's Estimated Production	4,500	9,000	9,000	9,000
Estimated Production As % of demand	42	60	40	26
Short fall	6,200	5,900	14,600	25,300
% needed to be imported	58	40	60	74

If no new capacity is added, but both mills are brought up to capacity, there will continue to be a short fall of domestic P&W paper. Bhrikuti has planned space for a second machine, Everest does not, but it has the physical space. Neither mill recovers their chemicals - Bhrikuti has a clarifier and fiber saver then dumps into the river. Everest looks like they dump the spent liquor right in the river without benefit of clarifier or settling tanks.

(d) Ownership

Bhrikuti mill is government owned having been given to Nepal by the Chinese. It is under the Ministry of Industry. The Everest Paper Mill is private limited company.

11. Fuelwood Companies

(a) Descriptor and Markets

There is one government owned organization called the Fuelwood Corporation which has been in business since 1963.

This corporation has a monopoly on the cutting rights of fire wood from the Forest Department, most of which comes from the Terai. They sell directly to industry and private households through 69 outlets in 27 Districts.

In practice the FWC issues permits to individuals and industries who actually collect and haul the firewood themselves. In some areas like the Kathmandu Valley FWC contracts out the transportation and sells to all consumers through their depots.

In addition to the FWC, there are private fuelwood sellers, mainly in the urban areas, that have obtained their supply legally through the FWC (or illegally) and currently sell for Rs. 115 per quintal verses the FWC price of Rs. 55 per quintal up to 300 Kg and Rs. 75 for more than that Industrial rates run from Rs. 2,250 - 3,250 per stack (500 cft stacked volume).

Consumers pay the higher price for a variety of reasons dryer wood, closer to their homes, they don't have to wait in line, almost always available etc.

Besides the above, "head loaders" bring wood to the urban areas, selling from house to house. In Nepal head loads of fire wood are permitted for everyone without royalty.

Up until 1980, firewood was exported annually in quantities of 100,000 tons to India. After 1980, the exportation was prohibited until 1984/85 when 2,200 tons were permitted to be exported from the 4 Western Districts.

(b) Production

The following are production figures from the FWC (in MT):

Year	Household (%)	Industrial (%)	Total (%)
1982/83	78,072 (62)	47,776 (38)	125,848 (100)
1983/84	87,808 (64)	50,264 (36)	138,072 (100)
1984/85	N.A.	63,936	

FWC officials claim they supply about 50% of the Kathmandu Valley market. Approximately 94% of the population is outside of the above discussion. We estimate that total consumption of the urban population would be about 1,350,000 MT annually.

12. Medicinal Herbs and Plants Companies

(a) Description

(i) HMG

The Herbs Production and Processing Co. Ltd. (HPPC) is a government owned co. which was established in 1978 with the objectives of utilizing and processing medicinal herbs and plants and to cultivate suitable herbs, fruits seeds etc; to carry out education and extension with private farmer. To date 1986, 51 ha of land have been planted to herbs and plants.

HPPC have built an modern processing plant in Kathmandu to process herbs, plants and also rosin and turpentine. HPPC is selling processed, semi-processed and unprocessed herbs to domestic customers and India.

<u>Year</u>	<u>Annual Sales Rs.</u>
1980/81	716,993
1981/82	2,031,309
1982/83	6,768,000 estimated

HPPC employs about 110 people on a full time basis and 300 part time. About 3,000 private people are involved in the collection and cultivation of these herbs and plants.

(ii) Private Sector

Many of the rural population harvest wild medicinal herbs and plants from the remote areas. These are sold in local towns. Local buyers sell it to Ayurvedic medicine makers. Some of the raw material itself is exported, mostly to India.

Ayurvedic Medicinal Plants

The Gorkha Ayurvedic Company Pvt Ltd (GAC) is a privately owned Co. which is associated with Centre of International Development and Research (CIDR) of France, have started processing ayurvedic medicines in Gorkha. Their source is the Forests and the people of three Panchayats where six cottage industry groups have been formed with an elected chairman. These groups are organized under the Ministry of Industries and involve approximately 350 villagers. GAC has established three nurseries to grow the 13 different medicinal herbs etc., they are producing. The villagers are being instructed in planting, caring, harvesting and drying of these medicinal plants. Some of these plants are annuals, some bushes and some small trees which take up to five years to produce the necessary quality of material for the medicine. We understood from the president of CIDR, Mr. Nicolas Beroff and Mr. Gilles Ponso the resident manager that these medicinal plant gardens have to be heavily protected from grazing. Both of these experts agreed that many of these medicinal plants could be grown right in the forest. It is our recommendation that this point could be pursued by RCUP efforts to get some of these medicinal plants planted in the local forest and protected from grazing.

13. Miscellaneous Industries

Miscellaneous forest industries include Wooden doors and Decors located in Kathmandu with an annual quota of 110,000 Hcft of Wood and one molding (bead) making industry located in Jhapa with a yearly quota of 20,000 Hcft of Wood. These two industries have come into existence just last year and are under the construction and establishment phase.

Raw Materials : From FD in the Terai

Market : The main market will be Kathmandu

Ownership : Both companies are privately owned.

Appendix - VII

Government stumpage Royalty Rates

(To be paid to Forest Department by the TCN, FPDB, Fuelwood Corporation, Forest Industries, individuals or by any agency for obtaining forest products under the authority invested by Forest Act 2018, clause 26 by amending the Forest products sale and distribution rules 2027).

The Royalty of Round Wood
(Rs. per cu. ft.)

<u>Sr. No.</u>	<u>The Species of wood</u>	<u>Old rates effective (2041/1/26) upto 1984</u>	<u>Current Rates</u>
1.	Dar, Sagwan, Oakhar, Satisal	Rs. 22.50	Rs. 34.00
2.	Champ, Sisso	Rs. 19.40	Rs. 30.00
3.	Sal	Rs. 13.00	Rs. 20.00
4.	Khair	Rs. 30.00	Rs. 45.00
5.	Asna	Rs. 7.20	Rs. 11.00
6.	Tun	Rs. 5.30	Rs. 8.00
7.	Jamun, Karma	Rs. 6.20	Rs. 10.00
8.	Tikul, Saur, Bijaya Sal, Siris, Phaldo, Sandan, Pajan, Banjhi	Rs. 5.00	Rs. 8.00
9.	Simal	Rs. 4.70	Rs. 8.00
10.	Bhudkul, Gutel, Pipali	Rs. 3.75	Rs. 6.00
11.	Chilaune, Gamahari, Katus	Rs. 3.00	Rs. 5.00
12.	Utis Lampate	Rs. 1.80	Rs. 3.00
13.	Khote Salla	Rs. 5.30	Rs. 8.00
14.	Other types of Salla	Rs. 4.40	Rs. 7.00
15.	Devdar	Rs. 3.45	Rs. 6.00
16.	Fir, Spruce	Rs. 2.80	Rs. 5.00

17. Kimbu	Rs. 5.25	Rs. 10.00
18. Other Species	Rs 1.20	Rs. 2.00
19. Khair Stump per stump	Rs. 50.00	Rs. 75.00

Note:

Firewood - Any log which is less than .056M (2 feet) in girth (Circumference) and less than .84M (3ft) in length other than the wood of Khair to be treated as a firewood.

The Royalty rates for woods other than Khair from 2 feet upto 3 feet in girth will be charged at only 33% of the above scheduled rates.

Only 50% of existing rates will be charged in Sindhuli and Surkhet districts for operation undertaken by TCN and FPDB. The Ministry of Forest & Soil Conservation can fix the rates or percentage depending on the circumstances for other areas too, if the FPDB and TCN work in similar areas.

Allowable limits of wood per family:-

3. In context of Cabinet decision made in 1979 (036-1-12) one family was allowed upto 1000 Cuft of round wood or upto 800 Cuft of sawn wood, but now onwards one family will be allowed only upto 300 Cuft of Round wood or upto 200 Cuft of sawn wood.

B. <u>Royalty of fire wood:-</u>	<u>Old rates</u>	<u>Current rates</u>
1. Per stack of 20 ft X 5 ft = 500 cft (14.16 M3) or per truck carrying that volume		
Industries and Enterprises	Rs. 322.00	Rs. 500.00
Household uses	Rs. 214.00	Rs. 214.00
For export	Rs. 428.00	Rs. 1428.00

N.B.

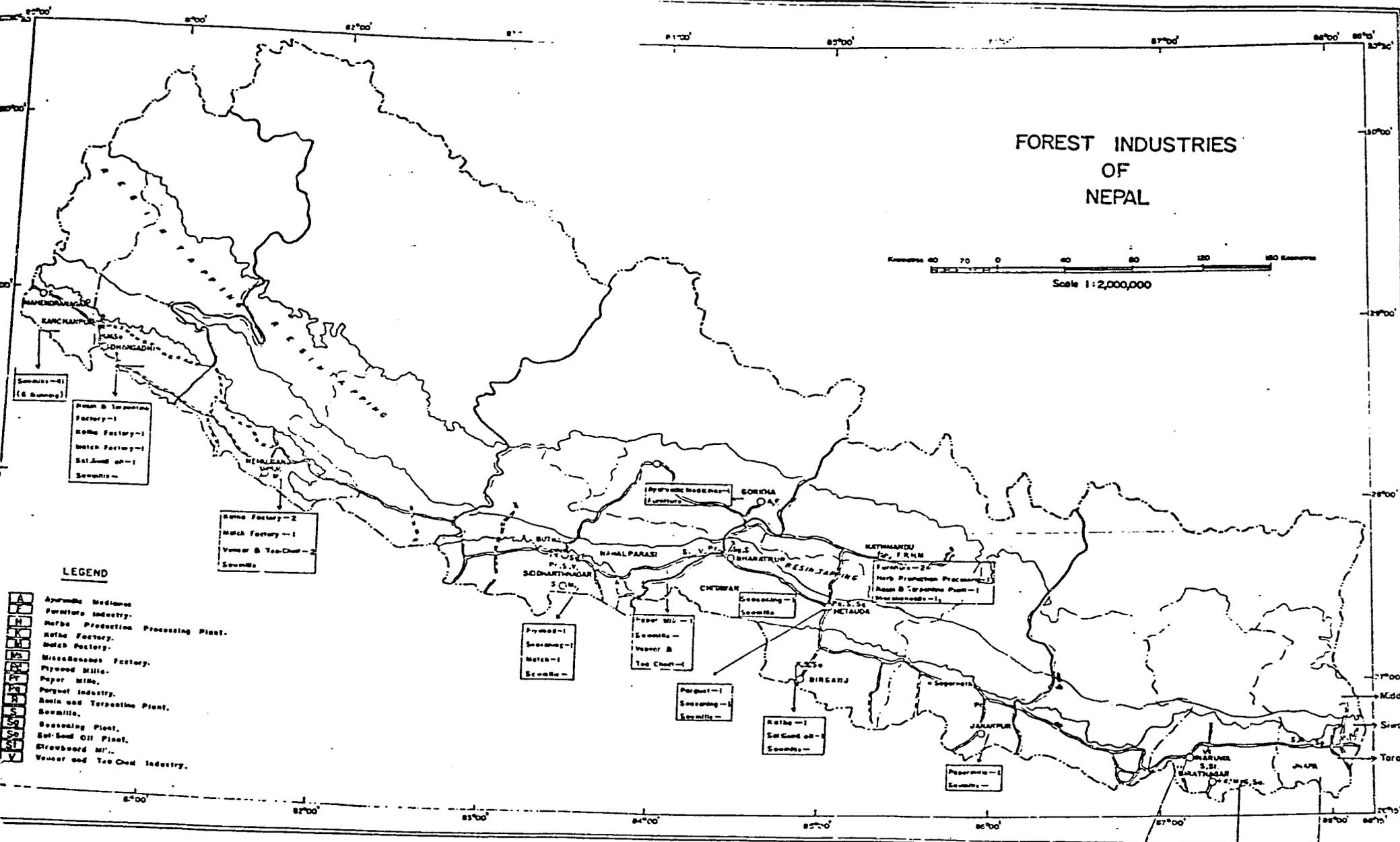
According to above mentioned Royalty rate it is estimated that one truck can carry approximately 214 maunds (8.1Mtons) and such one truck is estimated to be equal to 1 stack of 500 cft firewood.

The Royalty rates not mentioned in the above schedule remain unchanged and continue at the existing rates.

Appendix - VIII

FOREST INDUSTRIES OF NEPAL

Kilometers 40 70 0 40 80 120 160 Kilometers
Scale 1:2,000,000



LEGEND

- Ayurvedic Medicines
- Furniture Industry
- Herbal Production Processing Plant
- Kotha Factory
- Match Factory
- Miscellaneous Factory
- Plywood Mills
- Paper Mills
- Pulp and Paper Industry
- Resin and Turpentine Plant
- Sawmills
- Seasoning Plant
- Sol-Sand Oil Plant
- Strawboard Mf.
- Veneer and Tea Chest Industry

- Veneer & Tea Chest Industry - 1
- Sawmills - 1
- Strawboard - 1
- Plywood - 1
- Match - 5
- Sawmills - 5
- Sol-Sand Oil - 1
- Veneer & Tea Chest - 4
- Sawmills - 1
- Sol-Sand Oil - 1
- Miscellaneous - 1

