

CHAPTER II

COMPOSITION AND CONDITION OF THE CROP

50. The present forests of Ranchi West division have the following distinct types as a result of the edaphic factors, biotic factors and management factors.
1. Sal forests.
 2. Miscellaneous forests.
 3. Bamboo Brakes.
 4. Scrub with Lantana.
 5. Plantations.
51. Sal forests :- Sal is the major crop of the forests of Ranchi West division Except for small areas like the forests of Dugo, Pesrar, Pahardanru, Totore, etc. in narrow valley of Pesrar beat, where the crop tends to be moist, the forests in the northern centre and eastern zones are predominantly dry deciduous, Sal forests. The most favourite site of sal is the laterite capped bauxite zone of pat. Various Pats and their slope where sal is almost pure the soil is red ferruginous loam and boulder with sufficient ground water even on higher slopes.
52. The quality of sal is III to IV of seeding origin and of coppice origin. The associates of sal are *Terminalia tomentosa*, *Diospyros melanoxylon*, *Buchnania latifolia*, *Anageissus latifolia*, *Adina cordifolia*, *Butea frondosa*, *Albizia* spp., *Lannea grandis*, *Bowsellia serrata*, *Aegle marmelos*, *Ougenia dalbergoides*, *Lagerstroemia parviflora*, *Emblica officinalis*, *Terminalia chebula* etc. The common shrubs are *Flemingia chhaper*, *Croton oblongifolius*, *Nyctanthes arbortristis*, *Randia dumatorium*, *Indigofera pulchella*, *Wedlandia excreta*, *Woodfordia floribunda*, *Suymploco racemosa* and *Holorrhena antidysentreica* etc. Amongst the climbers, *Bauhinia vahlii*, *Ventilage madraspatana*, *Millettia auriculata*, *Combretum decandrum*, *Spatholobus roxburghii*, *Acacia pinnata* are met with. Lantana has invaded sal forests, wherever openings have been created but regeneration lagged. The Lantana has spread up to the high hills, smothering further young regeneration.
53. **Miscellaneous Forests** :- Geology plays an important role in the distribution of the miscellaneous forests. On quartzite and Gondwana formations, miscellaneous spp. mostly of dry deciduous type occur with sal, the relative composition varying according to topography, aspect and biotic factors. Miscellaneous forests occur in all the zones, somewhere it is continuous belt.

Wherever in this division, sal has been over exploited; thorny species like Carrisa, Zizyphus, Randia, and Flacourtia together with Lantana have gained the upper hand. In the northern zone, in some of the areas of Burmu thana like Hoyer, Umadanda, etc. only miscellaneous spp. are found partly due to the Gondwana formation and partly due to the indiscriminate cutting in the past. In the Western and Northern zones i.e. Bishunpur Thana the forests are drier making miscellaneous spp. prominent. Sal mostly in sapling or at best in pole stage is seen mixed with miscellaneous species.

54. The common miscellaneous species which usually occur in varying proportion in upper storey are *Terminalia tomentosa*, *Anogeissus Latifolia*, *Terminalia belerica*, *Terminalia chebula*, *Adina cordifolia*, *Lannea grandis*, *Madhuca latifolia*, *Butea frondosa*, *Diospyros melanoxyton*, *Hymenodictyon excelsus*, *Cassia frondosa*, *Bursera serrata*, *Lagestromia parviflora*, *Emblica officinalis*, *Schleichera trijuga*, *Sterculia uren*, *Cochlospermum gossypium*, *Albizzia* species, *Buchnaniania latifolia* and *Aegle marmelos*.
55. In the under-storey are found *Holarrhena antidysentrica*, *Antidesma decandrum*, *Crotion oblongifolius*, *Nyctanthes arbortristis*, *Gardenia spp.* and *Zizyphus* spp. *Acacia pinnata* Invasion of Lantana is almost menacing in the plains. The commonest climbers are *Bauhinia vahlii*, *Millettia auriculata* and *Combretum decandrum* etc. Sabai grass (*Eulaliopsis binata*) is nowhere plentiful. Khair is noticeable rarely along the borders of Palamau and Hazaribagh. Its occurrence is so limited and diameter size is not large. Most of them have even been eradicated by Katha smugglers.
56. **Bamboo Brakes :** On gneiss formation bamboo (*Dendrocalamuss strictus*) generally of poor quality comes up. Bamboo occurs more or less in all the ranges from negligible to abundant, depending upon the site quality, parent rocks and biotic factors.
57. The best quality bamboo areas are found in the Lohardaga and Banari Ranges bordering the district of Palamau. Bamboo here is thicker and taller in size than elsewhere Clumps are also less congested. They can be rated type A. Next in quality is the bamboo belt of Adar Range which can be said of type 'B'. This intertwined, bent, and crooked bamboos are witnessed in Burmu Range and outer parts of Lohardaga, Banari and Adar Ranges. These may be classified on type 'C'. The deteriorated condition of the above mentioned Bamboo forests is due to irregular unscientific exploitation by local population. Surprisingly Turi population in adjoining villages of such

degraded forests is concentrated. Being uneconomical bamboo forests of Burmu Range was never worked scientifically. This has resulted in intermingled clumps difficult to work and fit only for lathies.

The above mentioned three types of Bamboo are grouped as

Type A – Areas with healthy and well stocked clumps consisting of

Clump Quality I Culm Height of Bamboo 9m and above

Clump Quality II Culm height of Bamboo between 5m to 9m.

Clump Quality III Culm height of Bamboo below 5m.

Type B – Areas with well stocked but degraded, damaged, congested, and fire burnt clumps.

Type C – Areas where in bamboo clumps are sparse and scattered.

58. There are sporadic flowering of Bamboo almost every year in few clumps in a forest or other but no gregarious flowering has been reported in the past 40 years.
59. **Thorny scrub on bare hill:** - In both sal and miscellaneous forests a distinct category of thorny scrub on bare hills and near habitation are found. These are noticeable isolated exterior parts of Ranchi West Division as seen from the Ranchi-Netarhat Road. In the Southern zone of Ranchi West division, due to intensive pressure of population and cultivation the devastation of forests has been complete with scattered forests on hills or planes here and there. Consequently hills like Hanhat, Makand, Gitilgarh, Jhajtitali, Sarhwe Rahe and Tan in Kuru thana, Melani and Murtu chhalio etc., Ipamira, Ugra Lohardaga thana and Mandar thana are either base or are seriously invaded by the thick growth of thorny scrubs and mostly Lantana. Eastern and Southern side of the Ranchi West forests have suffered considerable from over fillings as well as severe grazing. If one sees map of Ranchi West Division the southern part (left of Ranchi-Netarhat road upto Adar) can be distinguished with continuous cultivation dotted with isolated barren hillocks with sparse thorny scrubs in the name of forests. External forests right to this road up to Banari and left from Adar to Banari also look degraded due to heavy biotic pressure like illegal felling for personal use or sale in weekly markets.
60. The remarkable feature of this type is that the soil is shallow and is incapable of supporting any forest growth except that of *Carrisa spinarum*, *Zizyphus oenoplia*, *Zizyphus jujuba*. Gardeniaspecies and Lantana. Wherever land is favourable bushy sal and Miscellaneous coppice growth from large stumps may be noticed.

61. **CLASSIFICATION :** As per classification of forests by Champion and Seth's the following types and sub-types have been recognized in Ranchi West Division.

(A) NORTHERN TROPICAL DRY DECIDUOUS FOREST

(1) Dry peninsular Sal-Type 5B/C IC

(2) Northern Dry Mixed deciduous forest – Type 5 B/62

(B) DEGRADED STAGE OF DRY DECIDUOUS FOREST

(1) Dry deciduous scrub-Type DE I

(C) BAMBOO BRAKES

(A) NORTHERN TROPICAL DRY DECIDUOUS FOREST

62. (1) Dry Peninsular Sal-type 5 B/C IC

This sub-type occurs on shallow soil derived usually from and metamorphic rocks wherever soil moisture conditions are unfavourable for the development of moist sal. even in areas of much higher rainfall. The soil often rests directly on impervious laterite and is sometimes calcareous. In typical site quality –III-IV sal regeneration is fair but slow. The characteristic composition of this type is as below:-

(a) **Top storey:** The top storey contains mostly *Shorea robusta* with *Anogeissus latifolia*, *Terminalia tomentosa*, *Scheichera trijuga*, *Adina cordifolia*, *Boswellia serrata*, *Terminalia belerica*, *Eugenia jambolana* and *Terminalia chebula*.

(b) The middle storey consists of *Diospyros melanoxylon*, *Buchania latifolia*, *Butea frondosa*, *Lannea grandis*, *Aegle marmelos*, *Lagerstromia parviflora*, *Embllica officinalis*. Ground storey consists of *Flemingia chhappar*, *Croton oblongifolius*, *Nyctanthes arbortristis*, *Randies excreta*, *Woodfordia floribunda*, *Holorrhena antidysentrica* etc.

63. Climbers as *Bauhinia vahlii*, *Ventilage modrasputana*, *Milletia suriculata*, *Combretum decandrum*, *Acacia pinnata* etc. are also found Grass like *Eulaliopsis binnara* is also found.

(2) Northern Dry Mixed deciduous forest-Type 5 B/C 2.

64. This type is formed by a mixture of trees practically all of which are deciduous during the dry season, usually for several months. The number of species is much less than in the foregone type and although a few tend to predominate over any selected area, the majority is not particularly

gregarious. The upper canopy is light but probably fairly even and continuous in the climax form. The latter is however very rarely encountered and an irregular often broken canopy is usual in consequence. The trees are having a relatively short bole and poor form and height rarely over 15m and often much less. The canopy is formed entirely of deciduous trees, most of which extend to moist deciduous forest with far better development. There is considerable inter mixture of rather smaller trees which in this type form part of the main canopy though in the moist deciduous. This has a second storey also. There is usually a thin shrubby under growth. The feature of the forest is the contrast between the hot weather condition when it entirely leafless and the soil fully exposed, and the monsoon condition when it gets almost luxuriant appearance. Grass is always present and is nearly always burnt off annually characteristic vegetation is described below.

- (a) **Top and second storey** : - Anogeissus latifolia, Adina cordifolia, Mitragyna parviflor, Hymenodictyon excelsum, Aegle marmelos, Chloroxylon sweitenia, Scheleichera oleosa, Lanne coromondelica, Gardenia spp. Cochlsperrum religious, Buchnanian latifolia, Ougenia oogenensis, Sterculia urens, Stereospermum suaveolens, Erythrina suberosa, Embllica officinalism, Madhuca indica, Vitex peduncularia and Dendrocalamus strictus.
- (b) **Shrub** - Helicteres isora, Strobilanthus auriculatus, Potalidum spp.
- (c) **Grasses** – Eulaliopsis binnata, Fulalia

Degraded Stage of dry deciduous forests:

65. (1) Dry Deciduous shrub-type DGI.

This type is a result of degradation of the dry deciduous forests. This type consists of a low broken soil cover of shrubby growth 3m to 6m high including some tree spp. reduced to similar conditions, usually many stunted from the base. Some bamboos are at times present. Many of the shrubs are distasteful to cattle (Hollerrhena, Dodonea) or thorny (India, Carrissa). Thin grass occurs throughout. These forests owe their stunted condition to maltreatment directly or indirectly connected with felling, lopping grazing and frequent fires.

Floristics: - Gaslga (Cochlospermum religiosum), Papra (Gardenia latifolia), Salai (Boswelia serraata), dhaunta (Aegle marmelos), asan (Terminalia tomentosa), (Lagerstromia parviflora) karla (Cleistanthus collinus), Mainphal (Randia dumetorum) harsingar (Nyctanthes arbortristis) Keonijhi (Sterculia urens).

Bamboo Brakes :

66. Only one species of bamboo i.e. *Dendrocalamus strictus* occur in Ranchi West Division. The important feature of this type is that the bamboo is completely leafless during autumn on hot weather. On quartzite as in Netarhat slope distribution is irregular. Bamboos except along nalla banks are not usually mixed with sal, where the sal forest begins to disappear. Asan (*Terminalia tomentosa*) Bija (*Pterocarpus marsupium*) and Karam (*Adina cordifolia*) with sal (*Shorea robusta*) mix with bamboo on deeper soil. In drier localities of quartzite formation of Banari, Adar and Lohardaga Ranges Dhaura (*Anegeissus latifolia*) Odina wodier also come with the above mentioned species. On Gondwana formations of Burmu Range bordering Hazaribagh, bamboo occur on mixed dry decious forests. This area contains fairly large percentage of bamboos with very few sal, the later only occurring in pockets where the soil is deeper Asan is common. On dry localities Odontha and Salai become dominant with bamboo as under storey. The bamboo on Gondwana is of type C. The flourished well on soil with time content.

PLANTATIONS :

67. The earliest effort to raise plantations was made in 1919 when Chirpine, eucalyptus and other exotic species were raised in grooves as avenue plantations on Netarhat plateau. After independence systemic afforestation effort was initiated in 60's with increasing targets every year till 90's. Many agencies were constituted and a large number of schemes were made. The Division can be seen crisscrossed with plantation of mostly Eucalyptus. Acacia and Chankundi with a few other species. Sal plantations have also been tried and there are some such patches like Badla and Kundo forests in Lohardaga Range where sal from seeds have come up very well.
68. The existing plantations are congested and fire damaged. Chir of Netarhat and Pakhar plateau are old and over matured. Eucalyptus in the Netarhat plateau and other places were to be worked under the Choubey's scheme but could not be sold due to non-bidding by contractors before 1980 and remained standing due to the non-transfer to the State Trading later on. The plantation process also nursed the degraded sal and miscellaneous root stock which were over-exploited by the local population. At many places the planted species have been suppressed by such coppice saplings and poles. The following are some brief note on the distribution by the writer during his tenure as the probationer and the Division Forest officer Ranchi West Division.

DISTRIBUTION & HABITAT OF SPECIES

69. **Sal** : Chemically sal appears to favour the more acidic and more ferruginous underlying rocks. Physically it appears to favour the more argillaceous soils but probability is that moisture contents rather than texture is the determining factor governs its distribution. The deeper the soil containing sufficiently high water content support sal and the result therefore is higher quality, under dry conditions it prefers to Norther and Eastern aspects.
70. Natural regeneration is very good on laterite soil. Coppice regeneration is also vigorous on many plateau. The growth is stunted due to shallow soil as ween on Netarhat plateau, Dobhipat etc. The growth is also stunted in plains like chir forests. Exterior Sal forests are mostly of pollard origin due to continuous hacking and felling. Most sal trees above 40 cm dbh are hollow and unsound.
71. **Bija** (*Pretocarpus marsupium*) : Found scattered in all types of forests but attain largest proportion in Quartzite and Gneiss. It is not found on very hot aspects Bija tree higher girth are very uncommon as most of them have been illegally exploited for manufacturing furniture. Natural and coppice regeneration are fair some plantation of Bija have been raised successfully.
72. **Rosewood** (*Dalbergia latifolia*) : A rare species which is confined to Gneiss Amphibolite formation. It rarely attains large size and much prone to theft. It prefers cool aspects and calcareous soil. Natural regeneration is good.
73. **Pandan** (*Qugenia dalbergiodes*): This occurs almost in all types of forests but attain good size on gneiss formation where it tends to form pure patches. It avoids dry aspects, natural and coppice regeneration is good.
74. **Gamhar** (*Gmelina arborea*) : A fairly rare species, rare due to sparte natural distribution on gneiss and amphibolite and over exploitation for furniture. At places a few trees of maximum diameter of 40 cm have been found. Natural regeneration is very rarely seen as it is highly palatable species. Some plantations of this species have been raised after obtaining seeds from trees on non-forest lands.
75. **Karam** (*Adina cordifolia*) : Rarely seen in Sal forests but in Miscellaneous forest it is common. It is worshipped by local adivasis. It appears to favour sandy calcareous soils but not found on hot aspects.

76. **Kusum** (*Schleichera trijuga*) : It is common in miscellaneous and bamboo forests and prefers Sandy soils. It stands hot aspects. It is prized for lac cultivation.
77. **Asan** (*Terminalia tomentosa*) : It is the most common associate of sal and found both in sal and Miscellaneous forests. It is also common in Bamboo forests. It requires calcareous soil for its best development but does not seem particular about the physical condition is fairly. Its maximum girth has been found 50cm. It coppices well and its natural regeneration is fairly good.
78. **Khair** (*Acacia catechu*) : Essentially a pioneer species which grow in all types of soils but is found mostly on slopes leading to Damodar and ravine areas of Lohardaga Range and Jamtihat of Banari Range. Natural khair trees of above 20 cm dbh are very uncommon as they have been exploited by illegal katha traders. Planted khair in chir forest give stunted look.
79. **Salai** (*Boswellia serrata*)
This is an important species of miscellaneous forests but also associates with sal on favourable sites. It is found in Western and Northern aspects adjoining Hazaribagh West and Latehar Divisions. Due to over exploitation in past during the 2nd world war for packing cases it has completely vanished from Burmu Range except in Umenda, Sark and a few other forests. In Ghaghra and Bishunpur thana, forests of salai occurs in drier areas of miscellaneous forests. The percentage of salai is so low in these forests that they can not be termed as separate salai bearing areas.
80. **Palas** (*Butea frondosa*) : A secondary growth tree. It is never found under natural forest conditions but lonely in or around formerly cultivated fields as seen along the Ghaghra-Netarhat Road in Adar Range. It spreads by root sucker and seeds.
81. Silvicultural requirements and information about some planted species is given in the part 2 of this working Plan in Afforestation cum Rehabilitation Working Circle. This must be consulted before taking decision for planting any species in the Division.

Injuries to which the crop is liable

82. Man is the most potent agency causing considerable damage to the forests. Damage by other agencies in fact may be considered negligible in comparison to the amount of damage by human agency.
83. Damage by human agency may be classified as under.
- (a) Indiscriminate cutting : Indiscriminate cutting and illicit fellings are the real factors responsible for disappearance of forests from any of the hills and plains which are now a mass of rock, or a bed of Lantana. The lazy habit of cutting the trees at breast height has resulted in malformed growth of crop and rendered timber yielding capacity practically useless.
- (b) Shifting cultivation : The practice of shifting cultivation has resulted in many blank patches or the ousting of sal forests by miscellaneous spp. Like kend, piar or thorny spp. By this practice forest loses its quality as more xerophytic species come up after some time. Soil deterioration and subsequent soil erosion set in make it impossible for the original valuable species to grow.
84. Grazing : Grazing is one of the greatest factors causing serious destruction of forest wealth. The problem of grazing is alarming in forests in the vicinity of the villages. In remote areas it is comparatively less. Wherever over-grazing occurs the soil becomes very compact and hard resulting in erosion due to excess run-off. Consequently the soil becomes useless for seed germination. Seedlings and saplings get mechanically damaged by trampling and browsing. Damage by grazing is more conspicuous in the forests situated in the plains.
85. Fire : Forest fires in the hot weather are responsible for good deal of unsoundness and disease among the trees. Regeneration gets burnt, growth gets retarded and numerous layers are destroyed. Fire damage becomes easily conspicuous under the existing conditions. Natural are very rare and it is in variably caused by human action viz. accidental, negligent and deliberate. Fires are caused by getting the vegetative manure burnt and washed down in their field from the burnt slopes, and also to get fresh crop of grass for their cattle during the subsequently rainy season. Crown fires are unknown in this division. Surface or ground fire which is prevalent in this region affects the ground vegetation only at best scorches the boles of trees. Surface fire kills the cambium and makes the trees susceptible to insect attack. Ordinary fire kills the seeding and effects genuination.

In the scattered patches damage by fire is limited to those patches and the fire does not spread. In the big forest blocks occurring on the district borders with Palamu, Hazaribagh and Singhbhum fires become extensive.

Damage by other agencies :

86. Frost : Frost causes considerable damage to coppice shoots and young seedling & particularly on the plateau above 3000 and in the valley areas along the foot hills. In recent years the damage by frost has been so severe that it calls for immediate attention and suitable silvicultural operations. The adverse effect of frost is noticeable in Chandlagi R. F. of Perrar Beat. It is alarming in Indian R. F. of Jaria range. The mortality is heavy along the river beds and in lowly areas.
87. Drought : No annual serious damage is caused to the existing forests by drought. But it does increase the difficulties in afforesting the dry eroded patches which are so common along the exterior boundaries. Incidence of high mortality and top drying was reported in 1967-68 after the famine of 1966 in Banari Range. For this the plan prescription was recommended to keep in abeyance till the exploitation of the top dry and dead trees. The dryness of the air, dry and sterile nature of the soil and the prevalence of hot westerly winds with paucity or rainfall damage much to the natural and man made forests in drier areas.
88. Lantana : Hitherto Lantana was not a problem but now it is becoming a nuisance in parts of Kuru, Angara, Bundud and Horhap beats. This is proving the worst vegetative pest and the menace is on the increase.
89. Lantana invariably invades the blank areas wherever it gets the opportunity. Though it serves as firewood in the deficit areas during dry season the harm caused by it over weights the small benefit.
90. It hinders the growth of sal sapling which is invariably found hidden underneath. The problem should not be over-looked and its eradication has got to be sought.
91. Climbers : Damage by climbers may be physiological and technical. They engulf the foliage of the trees and suffocate the plant and cause reduction in seed production. Plants may be broken, stem damaged and fluting caused.

92. The commonest climbers, as already mentioned, are *Bauhinia vahlii*, *Milletia auricularta*, *Spatholobus roxburghii* and *Combretum decandrum*. In scrubby dry areas Zizyphus is very common.

These climbers cause considerable damage by arresting growth of trees and making them branchy and crooked. Climbers suppress regeneration and hinder development of young crop.

93. Damage by climbers is more in moister areas but on the whole attack by climbers is not appreciable in this Division.

94. Parasite and Epiphytes : *Loranthus longiflorus* is fairly common among the dense sal pole crop in laterite soil. It causes malformation in the tree stems which might even result indeath of the tree. Another common parasite is *Viscum articulatum*, but damage by it is less serious Fungi are also met with Damage by epiphyte is negligible.

95. Other animals : Damage by deer, porcupine and wild pigs is very little.

96. Insects : Damage by sal borers and defoliators is negligible. Sometimes in 60's incidence of sal borer was reported around Netarhat. Since then it has not been reported in the division.

Harmful effects on the growth of the plant

97. Mining Industry : In the forest of the Ranchi West Division ores and minerals are found in abundance even just below the surface of the earth. The details have been described earlier in the first section. Commercially three major minerals are mainly extracted as mentioned below :-

(A) Bauxite

(B) Coal

(C) Lime Stone

98. Bauxite : It is extracted by open cast mining. All the pat of Lohardaga & Gumla district exists on Bauxite and laterite have remained under lease from last 70 years. At present mining activities are being done by Indalco at Bargupat, Hindalco at Mahuapat, Maidanpat, Rudnipat, Serendag pat and by other leasee at Jobhipat, Kegrang, Bagru etc. Earlier to 1980 the lease holder used to

mining within the boundary of the forest and before removing the forest for mining activities they had to pay revenue of the marked trees added with five times compensation. At some places due to ignorance of local staff or due to their connivance mining work was carried out by removing the forest without even completing the above mentioned process. At present the mining work is being carried out by lease holders on the raity, gairmajura and forest land from which forest cover had been removed before 1980. Due to this large and deep pits have been made on every pat.

99. The mining of Bauxite has adversely affected the forest flora and fauna which inhibit the downward slope of these hills and the raity agricultural land situated beneath. These are making adverse effects in the following ways:-
- (I) Pits and holes have been left in the part of the forest in which mining work has been done. Due to lack of soil and organic elements plants are not coming up in these parts.
 - (II) Generally the residues which have been left at the edge of the pat ready to slide with the rain water on the downward slope. These residues are moving downward with rain water damage trees and small wood and had spread over a large part of the slope. These choke the new germinated seedlings by covering over them. Besides these the residues also fill the water channels and cover the agricultural land near the foot hills. Due to this a large area of the agricultural land has become unfit for cultivation.
 - (III) Generally the labourers live in adjoining villages, which go to the pat daily in the morning to work and come down in the evening. They carry firewood, poles, logs etc. by illegally cutting the tree while coming down. The officer and staff who live permanently in the mining area fulfil their need of fire wood & timber by illegally felling and transportation of forest produce to distant places.
100. I had surveyed the Bauxite mining area while I was in-charge of the Ranchi West Division and had found out encroachment of around 80 acres outside the lease area. A large area of forests covered due to these bauxite mining.
101. (KH) Coal : Dakara colliery of the North Karanpura project comes in the jurisdiction of the Ranchi West division which consists three sub-regions namely churi, Khelari and Kerkatta which are doing both open cast mining and under ground mining in Churi, Khelari, Hutap, Hovar, Sarle, Beyar, Ray, Karkatta, Nawadih, Bishrampur and Jamuney villages.

102. The forests become degraded in the same way as described under the Bauxide head above in addition to that a large part of the forest land have been also encroached in making residential houses, Roads etc. According to a forest mining survey report published in 1991 the total area of the degraded forests due to coal mining and residues are noted below.

1	2	3	4	5	6	7	8
6.	Ray	Burmu	18	Total forest area	--	114.05	114.05
7.	Churi	Burmu	16	1302, 210, 168, 167, 211, 492, 577	581.09	--	581.09
8.	Karketta	Burmu	6	3668, 1411 part 153, 347, 204 160, 158 part 161, 184, 378	31.50	138.50	169.57
9.	Nawadih	Burmu	4	207 (part), 231 541, 876, 868 (part)	--	151.11	151.11
10.	Bishrampur	Burmu	15	516	56.67	139.47	196.14
11.	Tuwang	Burmu	5	560, 561.35 565, 442, 463, 414, 368, 261, 263, 531, 524, 567, 547, 570	56.28	138.66	195.19
TOTAL					780.10	1142.70	1922.80

103. The observation of forests nearly the C.C.L. leased mining areas to estimate the advance effect on them due to mining activities has revealed that nearly 5,000 hectares of forest lands have become degraded for meeting firewood and timber needs of C. C. L. employees in the last 10 years. These forest produce have been carried away by them as fire wood and timber by poaching. Illegal forest produces reach to Ranchi in huge quantity by trucks carrying the coal of C. C. L.

(C) Lime Stone :

104. Bihar State Mineral Development Corporation extracts the lime stone by open cast method in the forests of the Bentis & Bagda which are situated on the boundary of the Ranchi East &

Hazaribagh Forest Divisions. Any survey has not been carried out to estimate the forest areas degraded due to extractions of lime stone but a large area of forests have also degraded due to this in the same way as described under the Bauxite head.

FOREST FAUNA

105. **GENERAL DESCRIPTION** : The Ranchi west division which is a part of Ranchi Plateau, adjoins well with the wildlife rich Palamau forests and has the fauna of both the peninsular India and Indogangetic plane. But for the scattered vested forests Mandar, Lohardaga, Kuru and surrounded on all sides by cultivation, the entire area of the division is well suited to afford proper shelter and habitat to a great variety of wild lives. Around half of the tract is generally flat with scattered palatable grasses or shrubs which provide adequate cover and pasture for the wild life.
106. The following paragraphs give the occurrence, distribution and status of the main important wild animals in the division classified as under:-

I – ANIMALS (MAMMALS)

A – Game animals

- (i) Carnivora
- (ii) Herbivora

- a. Bovine and Antelope group
- b. Deer group
- c. Others

B – Non-game animals

II – BIRD'S

A – Game birds

- (i) Land birds

- a. Pheasants and fowls group
- b. Partridges and quail group
- c. Doves and pigeon group
- d. Others

- (ii) Aquatic birds

B-Non- Game birds

(iii) REPTILES

(iv) FISHES

(I) Game Animals

Carnivora

107. The Tiger (*Panthera tigris*) Schedule –I-39 Locally known as Bagh are sometimes seen in Netarhat, Madanpur, Pakhar and Kuru forests adjoining Latehar and Daltonganj South Division. It seems some tigers also migrate from adjoining Divisions and return after a few kills.
108. The panther, Leopard (*Panthera pardus* Schedule I-16B) :- The Common Indian Panther or leopard is locally known as Tendua or Guldar. They are mostly found in outer forest and many are apprehended to have been killed by the local farmers.
109. The Hyaena (*Hyaena hyaena* Schedule –III-12) :- The hyaena locally known as Lakkhar Baggha is dog like built with massive head and forebody but weak hindquarters. The hyaena generally keeps to open country. It is nocturnal in habit, scavenger by profession and emits foul smells. It usually feeds on carrion and occasionally preys on sheep, goats, calves, and stray dogs. It is commonly found in the whole Ranchi West forests, but many times killed at night due to similarity of stripes of tiger.
110. The Wild Dog (*Cuon alpinus*, Palas, Schedule –II-22) :- The wild dog is locally known as Kola or Jungli Kutta and is much like a domestic dog in general appearance. The wild dog is essentially a forest animal and inhabits areas where there is plenty of food, water and shade from sun. They go about in packs and hunt by day with usual prey being various species of deer, large and small wild pits. The number of wild dogs now in this division has greatly reduced and they are rarely seen.

Bovine and Antelope Group

111. The Four horned antelope (*Tetraceros quadricornis*, schedule –I-8A) :- Locally known as chausingha. This animal has two pairs of horns. It inhabits grass lands and forests and is rarely seen in the division.
112. The Blue or The Large Indian Antelope (*Boselaphus tragocamelus*) :- The local name of this animal is Nilgai. It is a great ungainly animal, some what horse like in build. Nilgai avoids forests and usually keeps opening areas and grasslands, bordering villages. They both graze and browse, feeding on the leaves and the fruits of the ber and other trees. They move in herds usually occur to ten. They are seen only in open scrub forests and are found almost everywhere division, more particularly in Mandar and Lohardaga ranges. Fenced plantation sites are regularly visited by this animal due to high quality palatable grass.

Deer group

113. The spotted Deer (*Axix axis*, Schedule –III-5) :- Known locally as Cheetal or Harin perhaps the most beautiful of all the deer. It is found wherever there is a jungle combined good grazing and plentiful supply of water, but the density of the population is abnormally these forests. They are more frequently seen near Macluskiganj.
114. The Barking Deer (*Muntiacus muntjak*, Schedule –III-2) :- The barking deer is locally known as Kotra. Its horns rarely exceed 13 cms. Its favourite haunts are thick forests. Kotra normally move singly or in pairs and is rarely seen in these forests, It is found almost in whole division and are susceptible to poaching.
115. The Sambhar (*Cervus unicolor*, Kerr Schedule-III-16):- It is the largest deer and carries the grandest horns. Forests preferably near the cultivation are the favourite haunts for the sambhar. Their food consists of grasses, leaves and various kinds of wild fruits. They are the worst browsers of natural regeneration and sal coppice shoots. The stags rub their horns against bark of small poles and trees, leaving a long blaze on the stem and sometimes kill the young plant by debarking. They do not associate in large number and are generally seen solitary. Their numbers in the Division is very small and they are found mostly in Adar and Banari ranges.

Others

116. The Elephant : (*Elephas maximus*) :- Commonly known as Hathi is not a permanent resident of this Division, but now it has been an annual visitor. Elephants from the Gumla and Daltonganj South Divisions generally come in group of 10 to 15 and wander in whole Division. They do much damage to crop and cattle. Sometimes human beings are also killed.
117. The Indian Hare (*Lepus nigricolis*, Schedule-IV-4):- Locally known as khargosh or khara are found all over the Division. They usually live in the neighborhood of villagers and cultivation and during summer, when grass is scarce, they are often seen along roadsides and even enter compounds to feed on the grass growing there, they do not cause any serious damage to the forest. They are mainly nocturnal. They have many enemies e.g. foxes, monogoose. It is said to have one or two young ones at each birth.
118. The Indian Fox (*Vulpes bengalesis*, Schedule –II-13):- Locally known as Lomri, keeps opening country bordering villages and habitation, living in burrows having several openings. It feeds on small rats, reptiles, insects including termites and white ants, birds, eggs, and also relishes fruits, its mating season is winter and the litter, generally consisting of four cubs is born in spring. It is found all over the Division.
119. The Sloth Bear (*Melursus ursinus*, Schedule –II part II-5) :- The Sloth bear locally known as Bhalu, has been seen in this Division in thick forest. Attacks by bhalu are reported some from deep forests villages. The number does not seem very large.
120. The Porcupine (*Hystrix indica*, Schedule-IV-4E) :- Known as Sahil. This animal is easily recognized by its quills which are modified more or less completely into spines. They occur all over the reserved and protected forests, more particularly in plantation areas. The porcupine adapts itself to any kind of country, moist, arid, open land and forests, they commonly shelter in grass and also borrows. They are nocturnal in habit and very fond of young Semal roots. They gnaw the dropped horns of deer. The young ones are born in early spring and may number two to three.
121. The Wild Boar (*Sus scrofa*, *Linnaeus* – Schedule-III-19):- The Wild Boar is locally known as jungli suar, generally live in grass bordering well wooded forests, they occur all over the division but are more common in Banari, Adar and Lohardaga ranges. It is an onerous animal and lives on roots, tubers, insects, snakes, offal and carrion. It is quite destructive to sal seedlings and plantations

which often suffer considerable damage by uprooting. They move in herds, generally in the early morning and late evening.

B-NON-GAME ANIMALS

122. The common Langur or the Hanuman Monkey (*Presbytis entellus*, Schedule II-4):- Locally known as langur, it occurs almost all over the division. It is black faced and is found in forests as well in the vicinity of villages and small townships. The langurs are arboreal in habitat and pure vegetarians, eating wild fruits, flowers, buds, shoots and leaves. The invertebrate enemy of the langur is the panther. The sight of one of a tiger or any animal that arouses suspicion produced guttural alarm note which sends the whole troop bolting. Mating takes place at any time of the year but apparently there is a marked breeding season and the young ones are generally born in May and June.
123. The Rhesus Monkey or Rhesus macaque (*Macaca mulatta*- Schedule –II-17A):- Locally known as Bandar. It has orange red fur on its face and rumps which distinguishes it from other monkey. It prefers a more open country and within forests is generally found in neighborhood of villages and townships. It generally feeds on ground plants and its food includes insects and spiders, unlike that of a langur. While feeding they sometimes associate with langurs but separate at night fall when retiring to rest. They breed at any time of the year but most of the Youngs are born between March and May. Their troupes are found throughout the division.
124. The Jungle Cat (*Felis Chaus* Guldenstaedt-Schedule-II2C):- The Jungle cat is locally known as jungle billi. It inhabits the drier and more open parts of the forests. It generally prowls in the morning and evening and resembles panther in its movements. It chiefly preys on poultry in the vicinity of forests and occurs almost, all over in these forests.
125. The Common Mongoose (*Herpestes edwadi* Schedule-IV-6A) :- The common mongoose, locally known as noels, is found almost everywhere in the Division. This generally inhabits open scrub forests near cultivation and takes shelter under bushes in hollows in the base of a tree, scrub or even a hole on the ground. They generally prey on rats, mice, snakes, lizards, frogs, insects, scorpions, centipedes, bird eggs and also on fruits and roots, as well as on carrots. The mongoose is very deft at killing snakes. It breeds all the year round.

126. The Wolf (*Canis lupus pallipes*-Schedule-I15) :- It known locally as Bheriya. The wolves live in forests but they are more common in bare and open regions. They are occasionally found on the outskirts of the Division. They live in fields or patches of scrub and thorn forests. They hunt by day or by night. What they hunt depends on the nature of the habitat. Near human settlements where there is little else to eat, wolves prey mainly on cattle and occasionally carry off children and when driven by hunger, become a serious meanace to human life. In areas remote from the human influence they hunt on hares, foxes and rodents. The main breeding season is at the end of rains and majority of the cubs are born in December. Three to nine whelps are born in a litter.
127. The jackal (*Canis aureus* Schedule II-2B) :- The jackal is Locally known as Siar or Gidhar and is one of the commonest wild animals seen every where in Ranchi West Division. Their number seems to be high inn comparison to other important wild animals. Jackals live in almost any environment, but generally keep to forests bordering villages and cultivation taking shelter in holes ruins or in dense grass and scrub. They generally come out at dusk and retire at dawn. They are scavengers by nature feeding caracass and offel, but their hunting instinct is not wholly dormant. They take to killing of birds and small animals and also feed on fallen ber fruits. Cubs are born at any time of the year and the litter consists of three to four.
128. Besides the above, a number of other non-game animals are also found. These include the bats, rats, mice, the palm squirrel (gilahari) etc.

BIRDS

A- GAME BIRDS

I- LAND BIRDS

Pheasants and fowl group

129. The common Pea fowl (*Pavo cristatus*) :- Locally known as mor. This bird has now been declared the national bird and is completely protected. It occurs almost all over the Division mostly seen in Banari Ranges adjoining Daltonganj South Division. They inhabit dense & scrub and open miscellaneous forests near streams and rivers. They usually keep in to small flocks and emerge into forest clearing villages and forest roads in the morning to scratch the ground for food. They have keen sight and hearing and are excessively shy and alert and are the first to

detect the presence of the larger cats on the prowl and give out warning call to other animals. They are omnivorous, feeding on seeds, grains, vegetable shoots, insects, lizards, and small snakes. The nesting season is from January to October. Three to five eggs are laid and hatching takes about a month.

130. The Red Jungle fowl (*Callus gallua*) is locally known as Jungli Murgi. It has become very scarce in the division due to poaching by local tribals especially the Birthors and Asurs. Its call may be heard in interior forests in evening and morning.

Partridges and quail group

131. The Grey Partridge (*Francoleonus pondicerianus*) : - The Rhura Titar inhabits dry open miscellaneous forests with grass tract. It occurs on the outskirts of the division and is very abundant. Some time one may found these running and crossing roads. These birds generally go about in a group of four to six, scratching the ground and cattle dung for food, running about in a jaunty upright carriage. They scuttle away quickly on alarm, taking refuge in some thicket. The food consists of grains, seeds, shots, berries, maggots, white ants and other insects. The nesting season extends practically throughout the year. Four to eight eggs, cream or mild coffee coloured are laid.
132. The common Quil (*Coturnix coturnix*) :- The common Bater is a bird of open country, frequenting grass lands and agricultural fields and is found in similar tracts in the division. It generally feeds on grain and grass seeds and also eats termites and other insects. It is a prolific breeder with the normal breeding season being between March and May.
133. The Black Partridge (*Francoleonus francoleonus*):- The Kala titar largely inhabit scrub and grassland in the vicinity of streams and rivers and is often seen in the miscellaneous forests and in open areas and near the southern outer boundaries of the Division. Their food comprises mainly of grain grass, green shoots, white ants and other insects. The nesting season is from July.

The doves and pigeon group

134. The Red turtle dove (*Streptopelia tranguebarica*) :- Locally known as Kabutar it prefers open cultivated country, usually single or in pairs but some times in large flocks in association with

other doves and is quite common in the Division. They glean grain and seeds on the ground. The nesting season is undermined and is practically throughout the year.

135. The Common Green Pigeon (*Treron phoenicoptera*):- The Harial is exclusively arboreal the division. They keep in flocks of ten to fifty birds. Their food consists entirely of fruits berries, mostly wild figs, buds and shoots. The nesting season is mainly March to June.

Others

136. The common grey Hornbill (*Tockus birostris*) :- The Dhanesh inhabits open miscellaneous and Sal forests. It is exclusively arboreal frequenting mostly fig trees and seen in pairs or parties of five to six birds. It feeds mainly on figs but also eats large insects and lizards. The nesting season is between March and June. Its occurrence in the Division is limited.

Aquatic Birds

137. The Nukta or comb Duck (*Sardidiornis melanotos*):- The Nukta inhabits the swamp and pools and occurs in the Division near Jaljamira and in Mandar block. It is usually met within family parties of four to ten. Their food consists of grain, shoots of wild and cultivated rice, other vegetable matter and also frogs, aquatic insects and occasionally fish. Eight to twelve eggs are laid.
138. Apart from the above the cotton teal (*Nettapus coromandeanus*) Gurgurra, the Brahmin duck (*Tadorna gerrugines*). Chakwa or surkheb, the Mallard (*Anas platyrhynchos*) Nilsir, the murghabio (*Anas* spp.) and the pochards (*Aythya* species) are also found in the division.
139. The common or fantail snipe (*Capella gallinege*) – Known as chaha it is a winter visitor and is common met with singly. Its food consists of worms, larvae, tiny molluscs and other aquatic insects.

Birds

Non-Game Birds

140. Among the non game birds may be mentioned the night jar or chakor (*Caprimulgus indicus*), the blue jayer. Neelkanth (*Corocias benghalensis*) the large Indian parakeet (*Psittacula* spn.) the Koel (*Dudynamys solopacea*), the wood necter (*Picus* spp.) the jungle babbler or sat bhai. The spiny babler (*Turdoides nipalensis*), the Strainted babbler (*Turdoides earlei*), the weaver bird or

bays (*Ploous philppinus*), the streaked baya (*Ploceus manyar flaviceps*), the Finn's Baya (*Ploceus megarhynchus*), the jungle wolet (*Glaucidium radiatum*), the barred owlet (*Glacidium cuculoides*), the barn wood owl (*Strix leptogrammica newarensis*) the jungle crow or Kawa (*Corvus macrorhynchus*), block kite or cheel (*Milvus migrans*), the Criffon yulture or gidh (*Cyps fulvis*), The black drongo king crow or Kag (*Dicrurus adsimilis Bechstin*), in wihiterbellied drongo (*Dicrunes carcrulescens*, Linnaeus), the racket tailed drongo (*Dicrurus*, *Linnaeus*) the streaked fantail warbler or ghas ki phutki (*Cisticola* Spp.), the ashy wren warbler (*Prinia socialis* syskes), the Indian wren warbler (Briniasubflaye), the Tree pie (Dendrocitta), the Red-vented Bulbul (*Pycnonotus cafer*), the yellow throated sparrow (*Petronis zanthocollis*) and the house sparrow, gauriyva (*Passed domesticus*), the emerald or bronzewingalensis), the emrald or bronzewinged or bronzewinged dove (*Chekophaps indica*), the spotted dove (*Streptopelia senegalensis*), the Lapwing (*Vanellus* Spp.), the stone curlew (*Buribus oediceus*), the Red Munia or Waxbill (*Estrilda amandava*) Ilnnaeus the spotted Munia (*Lonchura punctulata*) the Gold-fronted chloropis or Green bulbul (*Cholropsis aurifrons*), the Magpie Robin (*Copsychus saularis*), the Indian Robin (*Saxicoloides fulicata*), the Bushchat Saxicola spp. and the common green Bee-eater (*Merops orientia*). Among the aquatic bird is or waders, the little egret or Karchia bagla (Fgretta), the cattle egret gai bagula (*Babulcus ibis coromandus*). The herons, the white necked stork (*Ciconia enisconus*) and the Adjusant Stork (*Leptoptides dubius*).

Reptiles

141. The lizard-Among the various lizards, monitor lizard (*Varanus monitor*), the Goh deserves mention. It prefers drier areas and inhabits hollows of tree trunks and is a good runner. It is difficult to dislodge once it has got a firm hold. The breeding season is summer. Eggs 25 to 30 in number as deposited in a hole or an ant keep.
142. The python (*Python molurus*):- Known locally as Ajgar. It is sluggish in disposition and grows to a length of 8 to 9 meters but generally most specimens average 5 to 6 meters weighing about 200 kgms. or more. It has a bold pattern of broad dark brown markings on a light brown ground, colour. Its skin is very much sought after. Its food consists of mammals, birds, reptiles' suitable sizes and even large frogs. The number of eggs varies greatly from to over 100 or more. Its occurrence in this division is rare.
143. The Rat Snake (*Ptyas mucosus* Cops) :- The Dhaman is a non poisonous snake. It grows to about 2.20 m and feeds on rats and eggs of birds and reptiles. It is quite common in the Division.

145. The Cobra (*Naja naja* Schedule II-11) :- The cobra is easily recognizable by its hood, when it assumes a defensive or a warning posture. It is a poisonous snake but the danger from cobra bit is primarily from treading upon on at night. It apparently is not capable of aiming its strike accurately at day time. Moreover, the day time strikes are usually made with the mouth shut. It is about 2-3m in length and is said to be found widely.
146. Besides the above, the common Krait (*Bungarus coeruleus*) and the Russel's viper (*Viperrusselli*), water snakes and other snakes are also reported to occur in this Division.

FISHES

147. The fishes found in this region are rohu (*Labeo rohita*), Ketla, Mrigal, Gareei, Pothi and a variety of others.

INJURIES TO WHICH FAUNA IS LIABLE

148. The chief agencies causing injuries to the fauna are the man, ebidemics and atmospheric influences.

100 MAN :- The fauna has suffered at the hand of men, both directly and indirectly since time immemorial. The direct injuries to the fauna are caused by human activities of hunting, poaching, snaring, capturing and poisoning. With the development of motorable roads, increase in fire-arm licenses, extension of cultivation upto the edge of forests the open nature of the country and due to the army camps poaching has been on an increase. Chasing sambhar and other deer species by dogs and then killing by lathi blows when the animal is at bay is another example. In this Division certain species like tiger, panther, sambhar cheetal, hogdear, kotra, jungle fowls and red spur fowl have already become quite rare and unless stringent measures are adopted against the poachers or law breakers and existing resources tightened up, the wild life is likely to suffer further decline to extinct.

149. Among the indirect injuries caused by man is disforestation which reduces the area of habitat of the fauna and also their food supply, overgrazing and heavy incidence of fires in the forests for both of which man is responsible are the other factors responsible for causing a decline in the fauna. Extensive overgrazing results into exhaustion of natural food and cover for the herbivore. Fires also destroy the natural food supply, including the insects, the eggs and the forest areas.

150. EPIDEMICS :- Although epidemics amongst the wild animals have not been feature, they occasionally do contact infections and contagious diseases like the rinderpest through the domestic cattle grazing in the forests. Cheetals, Sambhars and other members of family are the usual victims of this disease.

CHAPTER – III

Utilisation of the Produce

Agricultural customs and wants of the People

151. Population and their main profession :- According to the latest census report (1991) the total population of this division is 6,38,650. The density works out to 1856 persons to a square km. The principal inhabitants are the aboriginal tribes the commonest being Oraons and Mundas. Among the non-aboriginals Momins are very common in Kuru, Mandar, Lohardaga, Ghaghra and Bishunpur blocks. In other areas people of all religions and castes, mostly Hindus live in varying proportion. The trader class, the Banias, is concentrated in the towns and larger villages.
152. The main profession of the people is agriculture and the main crops are paddy and vegetable cultivation is very scientific in plain areas while in interiors primitive methods continue to be employed. Three kinds of paddy are grown namely, Towan which is harvested in June, Gora which is harvested in August and Ropa which is ripened in October or November. Millets, pulses and oil seeds are also grown. The Momins are engaged in weaving and manufacturing of bed sheets and towels on cottage scale. Landless people in the entire tract of Ranchi West forests Division depend for their livelihood on forest or by trade based on forest produce. The houses are chiefly made up of mud walls with naria tile or thatched roof. The use of bricks for house building is mainly confined to towns and block headquarters. It is now spreading to places where townships are taking shape gradually. The items of furniture are of simple nature. The public in general require timber for house building, agricultural implements and for fuel. Trees of 12"-16" diameter are needed for doors, windows and dharnas. Poles upto 6" diameter are used for rafters and purlins. Bamboos are required for roof battens while chope (fibres) is used as ropes. Green brushwood (Jhank) is used as fencing materials and as a support for growing vegetables. Mahua flower is used as food for cattle and the poorer section also eat mahua flower besides fruits of kend and piar.

Necessity and Supply of the fuel to the villagers

153. The coal and other minerals are found in abundance under the earth of the forest of Chotanagpur plateau. Coal is generally found at both under and above the surface of earth. After the nationalization of coal such areas have been in possession of the Central Coal Fields Limited. In

the villages of the valley of the Damodar river such as Karkatta, Bishrampur, Khelari, Churi there is very rich stock of the coal which is exploited by the Dakara project of the C.C.L. The Damodar River is the northern limit of the Ranchi district part of the Ranchi West Division. This project with Khelari Cement Factory attracted a large population to this part which has increased pressure on the forests causing degradation of the adjoining forests in large scale. It is ridiculous to these villagers that coal is not made available to them at concessional rate for domestic purposes. They have no option but to go to forests for fuel. If the coal is made available to these villages at concessional rate by the coal company, it will certainly result in a decline in illicit felling.

Measures taken by the villagers to fulfil the shortage of firewood.

154. As has been analysed in further chapters the State Trading division supply only one thousand cubic meters of firewood against the huge demand of the 5,95,730 cubic meter of firewood of the Ranchi West Division. Now the question arises how the huge shortage of firewood is met. The villagers fulfil their need to a large extent by illegal exploitation of the adjoining forest. Some other measures which the villagers apply to meet their need of fire wood are noted below.

DUNG AND AGRICULTURAL RESIDUES:

155. Cow dung and agriculture residues are also used as fuel in addition to the firewood. It meets about 5% of total demand. It is not irrelevant to mention that costly manure like cowdung which is used as fuel affects the agriculture. The stem of arhar is important amongst agricultural residues to be used as fuel.

HEAD LOADERS :-

Groups of women, men and children can be seen every day entering into the adjoining forests of the villages and returning from there by collecting firewood on head. By rule it is provision that villagers can collect firewood for personal use from Government forests and can carry them by head loading. But these headloaders cut the green forests and can carry them by head loading. In fact these headloaders cut the green tree plants of the forest and leave them to dry. After a while they collect and take these illegally felled forest produce from forests. Hundreds of women and children have been indulged in these illegal works every day for many years which actually meet the firewood demand of the 50% of local population.

156. Occupation other than wood-cutting and selling, head-holding comes as the third occupation for the local population.
157. The households depend heavily on forest not only for fuel-wood also for food and other domestic necessities. This wood picking and selling has its own seasonal, fluctuations depending on the climatic condition and religious practices. Two week before Sarhul (a tribal festival) and two weeks after it, tribals generally do not enter into the forest to collect wood and other minor forest produces. Similarly during the rainy season (July-August) head loading is reduced substantially. But in the absence of alternative source of survival, economic compulsion overrules many of the customs.
158. Women Headloaders : Most of the women head-loaders are in the age group of 15-30, age which shows that during the best part of the working age these women head-loaders are engaged in head-loading occupation. The occupation is so hazardous that the female children or the old women can not venture to under rake this occupation. Majority of male head-loaders are below 40 and above 15 years of age.
159. A women head-loader usually carries 20 kg. of fuel-wood on her consisting of two of 10 kg each or three bundles of smaller size. A male wood-seller can carry four bundles of 10 kg each in a Bahangi two on each side of his shoulder. A head load of fuel-wood (20 kg. approx.) can be sold at a price between Rs. 10 to 15 depending on the season. To reach the market place within the fuel-wood, the firewood from forests, in many of these villages, Koutila Tax' system is in vogue. Each head-loader household is to deposit a certain amount per week to a village Headman, who deposits the money in the proper place to ensure carefree extraction of firewood from the forests. The whole system works smoothly because of an invisible link and gentle man's agreement between the different contractors in the area. The total pay-off on their way to the market has been estimated at between rupees four to four and a half rupee per 20 kg fuel wood.
160. These women head-loaders, are very hard-working and struggle all through for year for survival. They are apparently very docile and cannot articulate their view. They cannot ever express their miseries in orderly manner and most of them are illiterate in the sense of numeration.
161. But they well understand their group strength. They in a group are not afraid of forest guards. Because of this they normally move in groups. Though they are generally docile but once they are

annoyed, they turn to be very fierce. The writer had the occasion to come across such a situation. The total sale of firewood on weekly markets is given in chapters further. The sales of firewood and swait wood to different villagers are also estimated in further paragraphs.

162. Why is it that primarily women are involved in this occupation. Usually men take part in unauthorized wood cutting. If the male members do not find any remunerative work for the day they also follow the women. Accompanying the women they go into the forest and cut the green trees and keep it therefor one or two days and women carry that home afterwards as dry wood. Males alone either hardly enters into the forest or go to sell the products in the market.

163. The majority of women folk are headloaders due to the following reasons:-

(a) Women are to bear the major burnt of providing some food to the children at home and can not always depend on the male members of the family. Male members, if they earn some money by any means, may return home at night drunk spending all the money.

(b) Women can easily keep away the chasing forest guards.

(c) Women day labour (Reja or Banihar) is in demand generally for the transplantation and weeding in the agricultural field, that too at a lower wage rate. During the rest of the year they have little employment opportunity.

(d) According to the tribal traditions and practices, women have better accounting and bargaining capacity than their male counter-part. Women can wait longer hours to get a better price of the produce, while the males can hardly wait a few minutes to get a higher price by bargaining.

164. Use of thorns, bushes and wastes for the fencing of Agricultural land

The villagers bring thorns bushes and boles from the forest just after the start of rain use them to protect their agricultural crop from grazing. After the end of the rain they removed these thorns bushes etc. from their agricultural lands and use them as fuel. This work is repeated every year and it fulfils nearly 10% of the demand of the fire-wood.

165. CONSUMER DEPOTS AND PRITATE DEPOTS

The forest department of the Bihar Government has established consumer depots to fulfil the demand of the timbers of consumers of the town at concessional and approved rate of the

Government. But these consumer depots cannot supply firewood in adequate quantity. On the other hand villagers too are not able to purchase fire wood from the consumer depots due to their poverty. Even the town dwellers prefer to purchase the fire wood from the headholders at cheaper rate as compared to the rate of the consumer depots and their door. This also avoids the additional expenditure of transportation. Thus the consumer depots fulfil only the requirements of little population of the town.

166. Illegal transportation of firewood for commercial purpose

Headloaders don't carry firewood illegally only to fulfil their domestic requirement but also to sale they in adjoining towns and thus they earn their livelihood.

167. Girdling in trees of forests and roadside

As there is no restriction to carry firewood from dry trees villagers remove barks from the trees. While removing the barks irrationally it depends in such a way that it damages the trees considerably and gradually trees start to dry. Sometimes girdling is made in the tree due to which tree gets dried. Such dead trees are converted into timber and firewood. This illegal method fulfills the 5% demand of the firewood.

168. **Misuse of rights by rightholders**

In the IIInd part of the Khatiyani the villagers have the right to graze their domestic animal in the forest and to collect the forest produce for domestic purpose. Most of the Zamindari forests were in miserably sad conditions at the time of their taking over by the Government. The forest had become degraded due to indiscriminate illegal felling. The demand of the rightholders could not be fulfilled from such forests but still these forests are facing the pressure of the right-holders. These forests fulfil only 10% of the total requirement.

169. **Illegal exploitation of forest from reserved forests**

Unsocial elements and poachers manage to transport the timber and firewood with the help of the local people by truck and rail and take them outside for commercial purposes. Nearly 10% of the necessity of fire wood and timber is fulfilled by these illegal means.

170. **Kitchengas**

Only one agent is appointed in Lohardaga district for supply of LPG gas under whom nine hundred families are registered. It caters a negligible part of the total population.

178. **Solar energy**

Solar energy is not used as means of fuel in Ranchi West Division.

179. **Coals**

Although this Division has a large stock of coals and their mining and marketing is done by CCL as expected there is no big dump of coal available to the villagers. Villagers prefer firewood which is free and cheaper.

180. **Trees of Raiyati lands**

The villagers exploit trees for their personal use or for sale; different villagers planted Mango, Sal, Mahua, Sisam, Eucalyptus trees on Raiyati land. Many villagers have planted trees on their land under the social forestry scheme or under the scheme of free distribution of seedlings. The branches of these planted trees are used by villagers as firewood.

181. **Kerosene Oil**

The semi urban areas like Lohardaga, Mandar etc. people use Kerosene oil in stocks as fuel but number of such people is negligible.

182. **Residues of Saw-mills :**

In private saw mills situated in Lohardaga or in the saw mills of the depots of their Trading Division residues are available in huge quantity after sawing. These residues of saw mills are also used as fuel by the local people.

183. **SOCIO-RELIGIOUS RELEVANCE**

Important social festivals of their tribals coincide with the different bio-cycles of the forests. When Sal trees are in full-bloom in the month of March-April, 'Sarhul' an important festival is observed. Sarhul is a Festival of joy. During this period the tribals expect many of their requirements from the forest and their joy and gratitude to the forests are reflected in this festival. Generally tribals do not collect any minor forest produce before this festival. A social taboo is in vogue in this regard. If some forest produces are collected before the festival, women would not take those inside their houses, as it would be a bad omen. On the next day of Sarhul festival male folk go for hunting and fishing in groups.

184. Karma is another social festival, which coincides with the completion of transplantation of paddy, in the month of August-September. Karma is the local name of Adina cordifolia. During this festival the young boys and girls bring branches of this tree from the forest and plant those in the courtyard. After planting the branches they worship it and they young boys and girls dance, in a common place, under the trees, through out the night. The next morning the branches of Bhelwa tree (wild Cashew) are planted in the middle of the cultivated field, with the belief that it would save the crop from evil eye.
185. 'Jani Sikar' (Hunting by Women) is another festival, during which tribal women in the guise of males go out for hunting in groups to the forest every 12th year. Whatever they collect, are shared by every one in the group. This festival has an interesting background story of its origin. During the Mughal period, attempts were made to conquer the land ruled by the tribals.
186. The tribals also use forest for meteorological prediction. If the birds build their nests in small and thin branches, they predict that the monsoon would not be stormy, so simple house repairing would be enough. In summer if the chameleons neck turns red, they predict that the 'Monsoon is approaching'. In any year if bamboo flowers are found, famine would be their prediction for the year.
187. The forest not only provides food, fodder, fuel, medicine to the forest-dwellers but its flora and fauna also are closely related with their social and religious practices.
188. Forest is the pivot of tribal economy. Not only tribals are dependent on forests for 60 percent of their survival needs but their socio-cultural practices also are closely linked with the life cycles of the forests. Because of the above they are emotionally attached to the forests.

189. **Market & marketable products**

A list of weekly markets where forest produce from Ranchi west forests are sold or bartered is given below. The main forest produces are firewood, poles, and rough sleepers called chaupaal, ploughs and other agricultural implements. These are procured from distant forests and brought to these market places. Whatever remains unsold are mostly deposited in adjoining houses and again produced in the next market. This is one of the major sources of forest produce for the local inhabitants:-

Sl. No.	Name of the Block	Name of Market	Thana & Thana no.	Market	Remarks
1	2	3	4	5	6
1	Burmu	Thakurgaon	Burmu	86	Monday, Thursday
2	Burmu	Burmu	Burmu	67	Wednesday, Saturday
3	Burmu	Barandi	Burmu	96	Tuesday
4	Burmu	Umedanda	Burmu	43	Sunday, Thursday
5	Burmu	Chhapar	Burmu	33	Saturday
6	Burmu	Ray	Burmu	18	Tuesday
7	Burmu	Khalari	Burmu	13	Thursday
8	Burmu	Hesalong	Burmu	2	Friday
9	Burmu	Benja	Burmu	34	Tuesday
10	Mandar	Dumari	Mandar	74	Sunday
11	Mandar	Mandro	Mandar	76	Thursday
12	Mandar	Baski	Mandar	117	Tuesday
13	Mandar	Kathcharcho	Mandar	89	Thursday
14	Mandar	Mandar	Mandar	90	Sunday
15	Mandar	Brambey	Mandar	100	Tuesday, Sunday
16	Mandar	Chund	Mandar	97	Friday
17	Mandar	Tangar Basli	Mandar	43	Sunday & Thursday
18	Chanho	Chanho	Mandar	21	Thursday
19	Chanho	Marhai	Mandar	66	Friday
20	Chanho	Balsukara	Mandar	5	Saturday
21	Chanho	Sons	Mandar	9	Monday
22	Chanho	Koko	Mandar	55	Thursday

23	Chanho	Silgaon	Mandar	59	Saturday
24	Chanho	Patratu	Mandar	7	Sunday
25	Chanho	Hutar (Bijupara)	Mandar	85	Wednesday
26	Chanho	Choreya	Mandar	45	Tuesday
27	Kuru	Lawagain	Kuru	23	Tuesday
28	Kuru	Barkichapi	Kuru	12	Monday
29	Kuru	Jima	Kuru	20	Saturday
30	Kuru	Jogro	Kuru	40	Tuesday
31	Kuru	Kario	Kuru	41	Sunday, Wednesday
32	Kuru	Baridiah	Kuru	54	Saturday
33	Lohardaga	Ranpur	Loh	207	Saturday
34	Lohardaga	Lohardaga	Loh	194	Friday
35	Lohardaga	Irgaon	Loh	228	Sunday & Wednesday
36	Lohardaga	Bhaske	Loh	209	Thursday
37	Senhe	Mungo	Loh	86	Sunday
38	Senhe	Manhe	Loh	79	Wednesday
39	Senhe	Bhargaon	Loh	158	Wednesday
40	Senhe	Ugra	Loh	172	Tuesday
41	Senhe	Arru	Loh	156	Sunday
42	Senhe	Chamru	Loh	71	Monday
43	Kisko	Samardih	Loh	126	Sunday
44	Kisko	Kisko	Loh	130	Tuesday & Sunday
45	Bhandara	Masmano-Thakurgaon	Loh	179	Monday
46	Bhandara	Bhandara	Loh	237	Tuesday & Friday
47	Bhandara	Semra	Loh	246	Monday & Thursday
48	Bhandara	Kundo	Loh	272	Monday & Thursday
49	Bhandara	Nagjua	Loh	265	Monday & Tuesday
50	Ghaghra	-	Gha	1	Monday
51	Ghaghra	Adar	Gha	33	Sunday & Wednesday
52	Ghaghra	Sehal	Gha	17	Thursday & Saturday
53	Ghaghra	Ghaghara	Gha	79	Monday & Saturday
54	Ghaghra	Happamuni	Gha	83	Friday
55	Ghaghra	Chatti	Gha	53	Wednesday & Saturday
56	Ghaghra	Balakhatanga	Gha	85	Tuesday

57	Bishunpur	Bishunpur	Bis	55	Tuesday & Saturday
58	Bishunpur	Banari	Bis	28	Monday
59	Bishunpur	Banlat	Bis	10	Sunday
60	Mahuadar	Nesarhat	Mah	81	Wednesday
61	Barkagaon	Hendegir	Barka	90	Friday Out side R.W.D.
62	Barkagaon	Bachara	Barka	85	Sunday
63	Bero	Itki	Bero	102	Wednesday & Saturday
64	Bero	Narkopi	Bero	58	Sunday & Wednesday
65	Ranchi	Urugutu	Ranchi	13	Saturday
66	Latehar	Saraju	Ranchi		Saturday
67	Gumla	Kotam	Ranchi		Sunday & Wednesday
68	Gumla	Chaifitoli	Ranchi		Saturday
69	Gumla	Garwali	Ranchi		Saturday
70	Gumla	Larango	Ranchi		Saturday
71	Gumla	Bhurso	Ranchi		Wednesday
72	Gumla	Chharda	Ranchi		Monday
73	Gumla	Raikera	Ranchi		Friday
74	Bhainsador	-	Ranchi		Tuesday

Sl. No.	Name of the Block	Name of Market	Thana & Thana no.	Market	Remarks
1	2	3	4	5	6
1.	Ghaghara	Chapaka	Ghagra	78	Friday
2.	Ghaghara	To tambi	Ghaghara	62	Sunday
3.	Ghaghara	Gumis	Ghaghara	97	Monday
4.	Ghaghara	Arangi	Ghaghara	118	Sunday
5.	Ghaghara	Lodgo	Ghaghara	109	Monday
6.	Ghaghara	Puto	Ghaghara	111	Thursday
7.	Gumla	Basus	Gumla		Wednesday
8.	Gumla	Tingra	Gumla		Saturday, Friday
9.	Sisai	Murgu	Sisai		Tuesday, Saturday
10.	Sisai	Kurgi	Sisai		Monday
11.	Gumla	Langi	Gumla		Sunday, Wednesday

Dependence of forest –dwellers on forest

190. The dependence of forest-dwellers living in and around forest areas who are, by and large-tribals and backward Muslims, on forest resources for their economic survival and for the retention of their separate entity as an ethnic group, is helpful to understand the interdependence of the forests and the people in their surrounding. Socioeconomic and religious practices of the forest-dwellers are very closely interwoven with life cycles of the forests.

Economic dependence :

191. Population around forest largely depends upon forest resources for their economic survival. The terrain where they live is not conducive to get high yield. Due to absence of irrigation facilities coupled with poor water retaining capacity of soil, the people grow-mostly rainfed single crop paddy on don land and Marua, Gundli (inferior millet) and maize on arn land. Villagers in Kuru, Mandar and Chanho blocks raise large quantities of vegetables as they are fortunate enough to have some system of irrigation. The most common being, Lattha-Kunta (A ling pole as lever either of bamboo or eucalyptus with small back at one of its ends and a heavy stone tied at the other end placed on an indigenous long fuleruin made of bifurcated sal log.) can be found in abundance in this relatively plane area. In other places as average household owing 105 hectare of land can produce food sufficient only for four or five months for the family. The average yield of paddy is around 6 quintals/hectare. Another important feature of area is about fifty percent of the land owned by an average family are Tan land (upland) where regular remunerative agricultural activities are neither possible nor viable.

192. In the absence of regular remunerative alternative occupation, the people fall back on forest for their survival. Low productivity from agriculture increases the dependence largely on forest resources like, stems, tubers fruits, leaves, flowers, herbs and animals for food, shelter and medicines. With the emergence of money economy and its penetration even in the remote obscure places, a part of their cash requirement is met from minor forest produces. Even the Oraons, Mundas, Kharias who own, more land depend on the forests for almost half of their survival means.

193. In fact forests play the dominant role in the tribal economy. Forest dwellers are well acquainted with the biology of forest, not in any structured form, but through experiences and compulsions. During the lean months when they do not have any grain to cook, they cannot but depend on forest produce like Mahua, Salseed, Gentghi, Bamboo shoots, Mushroom, Jackfruits, Guava,

Kheksa, Bangnahi, Kendu fruits, and different types of wild potatoes from creeper plants and other different varieties of wild tubers, and a number of wild fruits and herbs. They store dried leaves, flowers, and fruits to use as food when those would not be available in the forest. Rice beer (Haria) though, customary liquor is fermented with jari-buty (tablet for fermentation) from herbs available in forests. A list of plants available in the forest from which different types of food are prepared is given below :-

Sl. No.	Local	Botanical Name	Purpose of use	Available in the month
1.	Kachnar	<u>Bauhinia vahlii</u>	Tender leaves are used as vegetable	May-June
2.	Katai	<u>Vangueria pubescens</u>	Green leaves are used as vegetable in Nov. – Dec. dried leaves in Jan.-Feb.	Nov.-Dev.
3.	Chakor	<u>Michelia</u>	Green leaves are used as vegetable in Nov. – Dec. dried leaves in May-June	Oct.-Nov & May-June
4.	Putkal	<u>Ficus cokar</u>	Tender leaves are used as vegetable in April-May and dried leaves in Dec.-Jan also used as Medicine for Stomach disorder	April-May
5.	Ban pechki		Leaves are used as vegetable	June-July
6.	Matta	<u>Antidesma</u>	Leaves are used as vegetable. Dried leaves (in winter)	April-May
7.	Kendu leaves	<u>Diospyros melanoxylon</u>	Tender leaves are used for Biri	April-May Jan-July
8.	Gungu leaves	<u>Cyperustegetum</u>	Both green and dried leaves are used to make village rain coat.	June-July
9.	Wild Palm leaves	<u>Phoenix sylvestis</u>	Used to make Mat & Broom	Jan-Dec.
10.	Keenar	<u>Bauhinia</u>	Green leaves are used as	April-May

		<u>purpurea</u>	vegetable in May-June and dried leaves in (winter) dec.-Jan.	
11.	Sal	<u>Shorea robusta</u>	Used to make pattal, (food plates), Dona (Bowl) wrapper, village Biri, Invitation card (Sal patta) for marriage.	Throughout
12.	Banyan Bar	<u>Ficus bengalensis</u>	Leaves are used as fodder	-do-
13.	Neem	<u>Azadirachta indica</u>	Used as medicine for skin disease. Blood purification etc.	Jan-Dec.
14.	Bhadur Sag		Leaves are used as vegetable	March
15.	Agasti	<u>Sesbania grandiflora</u>	Leaves are used as medicine for female	Jan. – Dec.
16.	Dumber (Fig)	<u>Ficus glomerata</u>	Leaves are used as fodder, fruit is used as vegetable	Jan-Dec.

II. Flowers :

Sl. No.	Local	Botanical Name	Purpose of use	Available in the month
1	2	3	4	5
1.	Kachnar	<u>Bauhinia variegata</u>	Flowers are used as vegetables	March-April
2.	Jirhul	<u>Indigofera</u>	Flowers are used as vegetables in March-May and dried flowers in May-July.	Aug.-Sept.
3.	Thumpa	<u>Bauhinia grandiflora</u>	Flowers are used as vegetables in Setp.-Oct.	Aug.-Sept.
4.	Dahu	<u>Artocarpus lakoocha</u>	Used as vegetables	April-May

5.	Sal	<u>Shorea robusta</u>	Sarhul festival	March-April
6.	Agsti	<u>Sesbania grandiflora</u>	Used as vegetable	April-May
7.	Mahua	<u>Madhuca indica</u>	Used as food June-July	March-April
8.	Muchkund	<u>Herospenum accufolia</u>	Powder from its flowers	

III. Fruits:

Sl. No.	Local	Botanical Name	Purpose of use	Available in the month
1	2	3	4	5
1.	Jamun	<u>Eugenia jambolana</u>	For food, to make juice as medicine for stomach trouble (Jan-Dec.)	June-July
2.	Dumber(Fig.)	<u>Ficus</u>	For Food	June-July
3.	Mango	<u>Mangifera indica</u>	Green mango at its tender stage is used as medicine for work in the stomach and at its later stage (burnt mango) is used against heat wave from scorching sun. Pickle of green mango is an important food item.	April-May
4.	Bel	<u>Aegle marmelos</u>	For food, medicine, for stomach trouble	May-June
5.	Char	<u>Chiranjii Buchnaniania latifolia</u>	Fruits used as food, seeds as dry nut for cash income only (this dry but is exchanged against sal)	April-May
6.	Pittor		For food	May-June
7.	Kendu	<u>Diospyros</u>	For food	May-June
8.	Sal seed	<u>Shorea</u>	Used as food also for extracting oil	May-June

9.	Konla	<u><i>Emblica officinalis</i></u>	Pickle, medicine & for oil	Jan-Feb
10.	Amra (Hog plum)	<u><i>Spondias Mangnifera</i></u>	Food and medicine	
11.	Amrul Sorrel	<u><i>Oxillis</i></u>	Food and medicine	
12.	Karonda	<u><i>Carissa carandus</i></u>	Medicine and for vegetables	April
13.	Baghanahi	<u><i>Capparis horrid</i></u>	For vegetables	June
14.	Kusum plant	<u><i>Carthamus tinctorius</i></u>	For eating and for extracting non-edible oil	April-May
15.	Mahua (Dori)	<u><i>Madhuca latifolia</i></u>	For non-edible oil	May-June
16.	Bhelowa	<u><i>Anacardium occidentale</i></u>	For food and for extracting oil used as medicine	May –June
17.	Sharifa	<u><i>Annona squamosa</i></u>	For food	Aug.-Sept.
18.	Ber	<u><i>Zizyphus jujuba</i></u>	For food (Branches are used to grow stick lac)	March-April
19.	Ber	<u><i>Cephalandra indica</i></u>	For vegetables (costly)	July-Aug
20.	Kheksa	<u><i>Gelonium multiblorum</i></u>	For vegetables (costly) oil used	July-Aug
21.	Porbo (Tubers)	<u><i>Ficus cumini</i></u>	For food	July-Aug
22.	Kathal	<u><i>Artocarpus integrifolia</i></u>	For food	July-Aug
23.	Bar	<u><i>Ficus bengalensis</i></u>	For food	April May
24.	Paniala	<u><i>Trapabispinosa</i></u>	For food	Aug-Sept.
25.	Neem	<u><i>Azadirachta indica</i></u>	For medicine	July
26.	Badi cahng		Fruits are used as laxative and antidote to snake bite	

IV. Oil-Seeds

Sl. No.	Local	Botanical Name	Purpose of use	Available in the month
1	2	3	4	5
1.	Kusum tree	<u>Schleichera trijuga</u>	For medicine	May-June
2.	Sal	<u>Shorea robusta</u>	For edible oil	May-June
3.	Bhelwa (Wild cashew)	<u>Semicarpus anacardium</u>	For medicine (used as acid)	May-June
4.	Dor (Mahua)	<u>Madhuca latifolia</u>	For medicine and edible oil	May-June
5.	Kujri	<u>Cesturs paniculata</u>	For edible oil	Dec.
6.	Erandi	<u>Ricinus communis</u>	Substitute of K. oil also for medicine (purgative)	June
7.	Karanj	<u>Pongamia glabra</u>	Villagers use it as hair-oil also for medicine (purgative)	May –June
8.	Aonla	<u>Emblicamyrobalan</u>	Hair oil, also for medicine	June
9.	Neem	<u>Azadirachta indica</u>	Oil used as medicine for skin disease	July

V. Bark

Sl. No.	Local	Botanical Name	Purpose of use	Available in the month
1	2	3	4	5
1.	Karanj	<u>Pongamia glabra</u>	Used as medicine	
2.	Neem Bark	<u>Azadirachta indica</u>	Used as medicine	March-April
3.	Arjun	<u>Terminalia arjuna</u>	Used as medicine	Jan-Feb.

4. Kheer kanchan Its bark is used for April-May increasing mother's milk.

VI. Grass

Sl. No.	Local	Botanical Name	Purpose of use	Available in the month
1	2	3	4	5
1.	Sawai grass	<u>Eleopsis binata</u>	For making rope	Oct.-Dec.
2.	Luckuighas	<u>Armdinelia setosa</u>	For making broom	Oct.-Dec.
3.	Kaushi grass	<u>Saccharum spontaneum</u>	For making rope & broom	Oct.-Dec.
4.	Phuljharu	<u>Imperata arundinaca</u>	For making broom	

VII. Resin

Sl. No.	Local	Botanical Name	Purpose of use	Available in the month
1	2	3	4	5
1.	Sal	<u>Shorea Robusta</u>	Unesued as Gum & Dhup (incense)	Jan-Dec.
2.	Babul	<u>Acacia</u>	Used as Gum	Jan-Dec.
3.	Pine	<u>Pinus roxburghi</u> <u>Roshin,</u>	Terpentine Oil	

VIII. Roots & Tubers

Sl. No.	Local	Botanical Name	Purpose of use	Available in the month
1	2	3	4	5
1.	Tirio		Used as Food	July

2.	Nappa		Used as Food
3.	Kulhi-han		Used as food and medicine
4.	Arum		Edible stem & roots, Used as vegetables
5.	Genthi (bitter)	<u>Dioscorea</u>	Used as food also used as medicine for stomach trouble
6.	Mushroom (wild)		Used as vegetables.
7.	Jhriti, Jhubra, Hibiscus Kudrum, Kudrim bajar, yentha, Safdaifia Datin gka's Chittour, Koreachal, Putrichal, Chaulisanga	<u>Hibicus</u>	Used to make fermentation Tablet to prepare Haria (rice bear)

(Most for these materials are used together as a mixture)

8.	Bhootnasan		This tuber resembles ginger and is used for stomach pain.
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IX. Medicines

Sl. No.	Local	Botanical Name	Purpose of use	Available in the month
1	2	3	4	5
1.	Bahera	<u>Terminalia</u> <u>belerica</u>	Bark, fruit, used in stomach pains	March-April
2.	Harra	<u>Terminalia</u> <u>chebula</u>	Used for cough and for making ink	July-Aug.
3.	Aonla	<u>Emblica</u> <u>myrobalan</u>	Used for pickles and medicine hair-oil and shampoo	Feb-March
4.	Bhelowa (Wild cashew)	<u>Semicarpus</u> <u>anacardium</u>	Extracted oil from fruits are used as medicine	May-June
5.	Charaigora		Leaves are boiled and the	Jan-Dec.

			water is used in anaemia
6.	Karanj	<u>Pongamia</u> <u>glabra</u>	Oil used for skin diseases and bed-sore
7.	Chiranta	<u>Switenia</u> <u>pulchella</u>	Leaves and stems are used for blood purification
8.	Kujri	<u>Calashus</u> <u>maniculate</u>	Extracted oil is used to remove a chronic pain particularly in joints.
9.	Erandi	<u>Recimus</u> <u>communis</u>	Oil used as purgative
10.	Neem	<u>Azadirachta</u> <u>indica</u>	Oil used for skin disease
11.	Gamiary (Sinduar)	<u>Vitex</u>	Fruits used as birth control medicines
12.	Tamarind	<u>Tamarindus</u>	Leaves (Pressed) are used as medicines for any swelling, Leaves (pressed) mixed with water are used in urinary trouble. Flowers are used (external) in eye-swelling. Bark water is used to increase digestive capacity. Pressed seeds with lemon juice are used for ring worm. It is used as medicine to prevent vomiting tendencies. Tamarind water is used for stomach wash especially in the case of poisoning.

194. Minor forest produces are used as domestic necessities and economic practices. Ballis, Bamboos, palm and Gungu leaves are used for constructing houses and other sheds. Agricultural and hunting instruments like ploughs, bows and fishing nets (kunni) are made of forest produces also. Umbrella-type sheds to protect the body from sun and rain are made of Gungu leaves.

195. Ropes made of Sawii grass are used to make cot (Khatia), machia (small four-legged stool). Mats made of palm leaves and grasses are used as carpet. Different types of grasses are used to make brooms.
196. The only means of energy for cooking and to keep oneself warm in winter is dry wood. Except eucalyptus they use all types of wood as fuel. On the belief that the smoke of eucalyptus wood adversely affects the eye-sight, the tribals do not use eucalyptus wood as fuel.

MAJOR FOREST PRODUCE REQUIREMENT

197. The requirement of forest produces for housing and agricultural purposes have been seen in the Table below.

Articles	Species used	Average Size	Species preferred
1.	House Building		
	(a) Posts	Sal, Asan Sandan, Sidha, Siris, Kend and Dhaura Paraus	8"-12" Sal, Asan, Sidha
	(b) Ridge pieces	Sal, Parasu, Sidha, Asan	6"-10" Sal and Panjan
	(c) Rafter	Sal, Parasu, Sidha, Asan	3"-6" Sal, Panjan
	(d) Battens	Bamboo, Brushwood	- Bamboos
	(e) Door 7 Window	Sal, Karam, Panjan, Sandan, Bija, Jamun, Sal, Kusum	12"-24" Karam, Gamhar, Bija, Mahua and Sal

II. FURNITURE

(a)	Tables	Sail, Big and Gamhar	16"-24"	Big & Gamhar
(b)	Chairs	Sal, Bija Gamhar & Sissoo	16"-20"	Biga and Gamhar, Panjan
(c)	Benches	Sal, Bija and Gamhar	16"-20"	Sal, Bija and Gamhar
(d)	Shelves	Sal	16"-20"	Sal
(e)	Bed frames	Sal, Bija Panjan & Sissoo	12"-16"	Sal and Bija
(f)	Bed frames	Sal, Bija Panjan and Sissoo	12"-16"	Bija and Gamhar

III. AGRICULTURAL & OTHER IMPLEMENTS

(a) Ploughs	Sal, Asan, Kusum and Gamhar	6"-12"	Sal
(b) Yokes	Sal, Gamhar	4"-6"	Gamhar
(c) Levelling Board	Asan, Sal	8"-12"	Sal
(d) Handles of axes	Dhaura, Dhaman & Bamboo	4"-12"	Sal
(e) Bahangipoles	Bamboo, Dhaman & Gamhar	4"-8"	Any Size
(f) Drums	Gamhar	Over 8"	Any Size

IV. CARTS

(a) Cart axle	Sandan, Dhaura, Kusum, Panjan	5"-10"	Dhaura & Sandan
(b) Fallows	Sal, Panjan	12"-16"	Sal
(c) Hubs	Panjan	12"-16"	
(d) Spokes	Sal and Panjan	12"-16"	Panjan
(e) Body frames	Sal and Dhauntha	1"-10"	Sal or Dhauntha

V. OTHER HOUSEHOLD ARTICLES

(a) Dhenkis	Sal, Kusum	12"-16"	Sal preferred
(b) Samats	Sal, Asan and Kend	6"-8"	Asan preferred
(c) Combs grains & Oil measures (Paila)	Papra, Gamhar, Salai Bhurkund	6"-10"	Papra, Gamhar and Bhurkund
(d) Kolhus	Sal, Jamun & Kusum	12"-16"	Sal, Kusum 20" and

VI. FUEL Generally all species Any Size Asan, Dhaura, Panjan, Sal

VII. CHARCOL Sidha, Panjan, Arjun, Any Size Sal, Asan, Sidha
Sal, Asan, Dhaura

SYNOPSIS OF REQUIREMENTS :

The requirements of other minor forest produce of the people are the following:

- (a) Bamboo for roof battens, house walls, fencing, fish traps, baskets, bows and arrows. Turi and Domes requires green bamboos for making baskets and thereby earning their livelihood.
 - (b) Rope and strings made of sabai and bark fibres of mahulan (*Bauhinia vahlii*).
 - (c) Thatch grass (*Heteropogon contortus*) for roofing.
 - (d) Khajur leaves (*Phoenix acaulis*) for mat making.
 - (e) Leaves of Sal and Mahulan (*Bauhinia vahlii*) for making cups and plates.
 - (f) Flowers and fruits of mahua for food, liquor and edible oil fruits of kend, Jamun *Gardenia gummifera* and *Gardenia latifolia* ber, piar and kernel of seeds of piar called chiraunji for barter.
 - (g) Gethi – A fleshy tuberous root of *Dioscorea* spp. Creeper is used as food.
198. The most important of all the available trees for consumption is Sal tree. Sal leaves are used to make kidi (indigenous cigar) instead of kendu leaves. Sal leaves are used as foliage to rear tasar silk worms (cocoons). Branches of it are used as tooth brush and fuel-wood. Sal logs are used as timber. Incense (DHUP) is made of sal resin. Sal is also useful for their social and religious practices. Sal leaves with a few rice, coloured with turmeric are used as invitation letters for marriage ceremony. The place of worship of the tribals ‘Sarna’ is located in a sal grove. In short a sal tree has socio-economic and cultural importance them.
199. Next to sal is Mahua. Liquor from mahua flower is very much favoured by the forests dwellers. Pure (undiluted) Mahua liquor is used as medicines for mothers after child birth. Mahua flowers are used also as food. When no food grains are available, they boil sal seed with a few mahua flowers in it, to prepare tasty and nutritious food. Oil is extracted locally from mahua seed (Dori), which is used for both edible and non-edible purposes. Many of the tribal festivals are held under the shade of mahua tree.
200. Likewise oil is also extracted from Karanj and Kusum seeds and is used for various purposes.
201. Lac is another important cash crop produced in the forest. Good host trees for lac, Kusum, Palas and ber (plum).
202. Tasar silk cocoons are reared on Arjun and Asan. It is found very common in forest near Chiri. Rearing of tasar cocoon by putting larva on the host plants begins on an auspicious day in the season. Usually people produce one crop (winter crop/ commercial crop) in a year. The whole

process of growing Tasar cocoons, starting from putting the larva on the leaves of the host plants to harvesting the cocoons, takes forty-five days. This is an important cash crop of the local population.

203. **Resin and Gums:** They collect resin from Sal, Salai and Piar trees. These resins are used both for domestic consumption and cash income.

Depot Rate of Supply Timber and other Forest Produce

204. Rates for the supply of timber in form of logs as also sawn timber and other forest produce from the central depot has been fixed by the Chief Conservator of Forest cum State Trading by his office order no. 32 dated 25.04.1996 applicable from 01.05.1996.

Schedule A

Depot rates for sawn timber in Rs. Per cum.

1. Name of species : SAL (Shorea robusta)

IS – 1150-1976

SAL

Length class in cm		Either midth or thickness in mm	
More than	Upto	Upto 130	More than 130 and Upto 350
150	185	8743	12204
185	245	9108	12751
245	305	9654	13661
305	365	12869	16433
365	425	12960	18612
425	485	17801	22564
485	545	17801	23564
545	605	19457	24425
605	-	20285	25668

2. Name of species :- (ii) Teak (*Tectona Grandis*)- Sagawan.

IS : 1150-1976

TEAK

Length class in cm.

Length class in cm. Either width or thickness in mm.

More than	Upto	Upto 130	More than 130 and Upto 350
	150	20270	28735
150	185	21384	29848
185	245	25616	31853
245	305	27622	35417
305	365	28075	40318
365	425	34303	44104
425	485	36308	46106
485	545	38090	49450
545	605	40096	50341
605	-	-	54526

3. Name of the species : **BIJA** (*Pterocarpus mursapium*). BIJA Gamhar (*Gmelina arborea*)

Length class in Cm		Either midth or thickness in mm	
More than	Upto	Upto 130	More than 130 and Upto 350
	150	11611	18196
150	185	8743	12204
185	245	12355	18420
245	305	12804	18646
305	425	13254	19993
425	485	14826	25159
485	545	15725	26732
545	605	17072	27856
605	-	17296	28080
-	-	17747	29652

4. Name of species : **SISSOO** (*Albergia Sissoo*) SIS

More than	Upto	Upto 130	More than 130 and Upto 350
	150		
150	185	9129	10319
185	245	10319	11510

245	305	11510	12701
305	365	12701	13693
365	524	13693	14884
524	485	15281	16471
485	545	15479	16868
545	605	15876	17067
605	-	16273	17265
-	-	17662	18853

5. Name of Species : **ASAN** (*Terminalia tomentosa* LUREL)

Toona (*Cedrela toona*) Toon

Length class in cm		Either width or thickness in mm.	
More than	Upto	Upto 130	More than 130 and Upto 350
	150		
150	185	6929	10097
185	245	7325	10097
245	305	11510	12701
305	365	12701	13693
365	485	15281	16471
485	545	15479	16868
545	605	15876	17067
605	-	16273	17265
-	-	17662	18853

6. Name of Species : Karam (Haldu) – Adina cordido lia : Hal

Length class in cm		Either width or thickness in mm.	
More than	Upto	Upto 130	More than 130 and Upto 350
	150		
150	185	8862	11893
185	245	9329	12127
245	305	9700	12594
305	365	10261	13526
365	425	11554	15070

425	485	12318	17035
485	545	13104	17560
545	605	13628	18346
605	-	14153	18870
	-	15725	19918

7. Name of Species : **SIRIS** (*Albizia lebbbeck*) KOK

(*Albiza procera*) ... SS

Anjan (*Ougenia daborgeoides*) ... SAD

Length class in cm		Either width or thickness in mm.	
More than	Upto	Upto 130	More than 130 and Upto 350
	150	6800	7225
150	185	7013	7864
185	245	7225	9138
245	305	7864	11051
305	365	8288	11689
365	425	10597	13775
425	485	11504	13997
485	545	12665	15553
545	605	13331	16219
605	-	13775	16885
	-		

8. Name of Species : **KARAM (HALDU)** : *Adina cordifolia* : Hal

Length class in cm		Either width or thickness in mm.	
More than	Upto	Upto 130	More than 130 and Upto 350

9. Name of species : **KAJ** (*Bridelia retusa*) : **KAJ**

Length class in cm		Either width or thickness in mm.	
More than	Upto	Upto 130	More than 130 and Upto 350
	150	8453	9660
150	185	9649	10385

185	245	8935	11833
245	305	10350	14008
305	365	10867	14731
365	425	12067	16422
425	485	13283	16663
485	545	14490	18354
545	605	15456	19079
605	-	15940	19804
	-		

10. Name of species : JAMAN (*Syzygium*) : JAM

DHAURA (*Anogeiossus latifolia*) AXL

OTHER HARDWOODS

Length class in cm		Either width or thickness in mm.	
More than	Upto	Upto 130	More than 130 and Upto 350
	150	5991	7651
150	185	6163	7864
185	245	6800	80764
245	305	7013	8926
305	365	8501	9989
365	425	9343	10664
425	485	10442	11332
485	545	11110	11554
545	605	12220	12887
605	-	12442	13331

11. Name of Species : JHINGAN (*Lannea grandis*) JHI

Salai (*Boswellia serrata*) SAA

Length class in cm		Either width or thickness in mm.	
More than	Upto	Upto 130	More than 130 and Upto 350
	150	3833	9499
-	-	4666	5333

12. Name of Species : KEKAR (*Garuga pinnata*): GAU

13. Sleepers of JAM ., and other hardwoods.

B.G.	275 cm x 250 mm x 130 mm	Rs. 354.00 per pieces
M.G.	185 cm x 200 mm x 115 mm	Rs. 163.00 per pieces
N.G.	150 cm x 180 mm x 115 mm	Rs. 115.00 per pieces

Length class in cm		Either width or thickness in mm.	
More than	Upto	Upto 130	More than 130 and Upto 350
	150	4189	4888
150	-	4888	5935

SCHEDULE – B

DEPOT RATES FOR ROUND LOGS IN RUPEES PER CU.M.

(1) Name of species : SAL (*Shorea robusta*) IS : 1150-1976

Abbreviated symbol – Sal

Length class in cm		More than		Mid Girth class in cm	
More than	Upto	80 and	More than	More than 120	More than 150
		Upto 90	90 and	and Upto 150	
			Upto 120		
0	244	4372	5832	6842	9122
244	365	4968	8640	9539	10783
365	488	5365	9936	10783	11808
488	610	6209	12134	129360	14256
610	-	7865	13049	14256	14400

(2) Name of the species : **TEAK (SAGWAN)** (*Tectona grand-is*)

Length class in cm		Mid Girth class in cm. TEAK				
More than	Upto	60 and	More than 75	More than 90	More than	More
		Upto 75	Upto 120	and Upto 120	120 upto 150	than 150
	100	7465	9360	12480	1447	15796
100	244	8736	10530	15796	18690	20533

244	365	10530	11846	18427	18924	25008
365	488	11506	13690	22176	25460	30664
488	610	14048	10605	25735	30116	34496
610	-	14352	18617	28740	33949	36686

(3) Name of species : BIJA (*Pterocarpus marsupium*) : BIJ CAM

Gamhar (*Gmelina arborea*)

Length class in cm.		Middle Girth class in cm.			
More than	Upto	60 and Upto 90	More than 90 Upto 120	More than 120 upto 150	More than 150
	244	4942	7614	9884	11008
244	365	5392	10333	11681	12804
365	488	6964	11681	13030	14153
488	610	7956	13572	14976	16848
610	-	8657	16195	17549	18953

(4) Name of species : SISSOO (*Dalbergia sissoo*) SIS

Length class in cm		Mid Girth class in cm.			
More than	Upto	60 and Upto 90	More than 90 Upto 120	More than 120 upto 150	More than 150
-	244	3969	5358	7144	7938
244	365	4564	6152	8938	8732
365	488	4961	6946	8732	9526
488	610	5358	7541	9526	10319
610	-	5954	8732	10319	11312

(5) Name of species : Asan (*Terminalia tomentosa*) IAU

TOON (*Cadrela toona*): TOO

Length class in cm		Mid Girth class in cm.			
More than	Upto	60 and Upto 90	More than 90 Upto 120	More than 120 upto 150	More than 150
-	244	3168	4530	41000	5544
244	365	3960	5054	5988	6635
365	488	4356	5560	6653	7318

488	610	4868	6458	7651	8346
610	-	5588	7104	8346	8810

(6) Name of Species : JARAM (*Adina Corditolia*) : HAL

Length class in cm			Mid Girth class in cm.		
More than	Upto	60 and	More than 90	More than	More
		Upto 90	Upto 120	120 upto 150	than 150
-	244	4664	6028	6280	6781
244	365	5113	8288	9544	10549
365	488	6571	11532	12055	12842
610	-	8030	11794	12842	13890

(7) Name of species : KAJ (*BRIDELIA SPP.*)

Length class in cm			Mid Girth class in cm.		
More than	Upto	60 and	More than 90	More than	More
		Upto 90	Upto 120	120 upto 150	than 150
-	244	3864	5796	6278	7246
244	365	4105	6278	7003	7487
365	488	4348	6772	7272	8212
488	610	4589	7728	8453	8453
610	-	5314	8694	8935	9660

(8) Name of species : SIRIS (*Aibizia lebbek*) : KOK

ANJAN (*Ougania dalbergeoides*) : SAD

Length class in cm.			Mid Girth class in cm.		
More than	Upto	60 and	More than 90	More than	More
		Upto 90	Upto 120	120 upto 150	than 150
-	244	2975	4675	5100	5738
244	365	3188	5100	5526	6163
365	488	3643	5314	5738	6588
488	610	4000	6666	7110	7110
610	-	4444	7332	7554	7998

(9) Name of species : JAMAN (*Syzygium SPP.*) JAM

DHAURA (ANOGIASSUS LATIFOLIA) AXI

OTHER HARD WOODS

Length class in cm.		Mid Girth class in cm.			
More than	Upto	60 and Upto 90	More than 90 Upto 120	More than 120 upto 150	More than 150
-	244	2550	3188	3826	4250
244	365	2975	3826	4250	4889
365	488	3778	4444	4888	5555
488	610	4000	4888	5333	5999
610	-	4222	5333	5777	6666

(10) Name of species : JHAINNGAN (*Lannea grandis*) JHI

SALAI (*Boswellia serrata*) SSA

Length class in cm.		Mid Girth class in cm.			
More than	Upto	60 and Upto 90	More than 90 Upto 120	More than 120 upto 150	More than 150
-	244	1832	2165	25000	2666
244	-	1999	2333	2666	3165

(11) Name of species : KEKAR (*Garuga Pinnata*)

Length class in cm.		Mid Girth class in cm.			
More than	Upto	60 and Upto 90	More than 90 Upto 120	More than 120 upto 150	More than 150
-	244	2269	2794	2978	3143
244	-	2618	3143	3316	3840

SCHEDULE – “C”

Depot rates of ples		Rate per price in rupees			
Length class in cm.	Diameter in	Sal/Asan	Misc.	Teak	
More than	Upto	cms			
(1)	(2)	(3)	(4)	(5)	(6)
244	366	10.00	29	22	64
366	426	10.00	36	25	78

426	486	10.00	44	36	98
Upto	244	12.00	38	26	84
		15.00	56	39	124
		17.50	68	47	150
		20.00	76	57	163
		22.50	97	68	209
244	304	12.50	53	36	105
		15.00	60	41	122
		17.50	92	65	195
		20.00	133	93	290
		22.50	169	121	376
304	364	12.5	60	41	125
		15.0	103	71	223
		17.0	120	84	262
		20.0	169	121	376
		22.5	208	194	452
		15.0	103	71	223
		17.5	120	87	262
		20.0	169	121	
		22.5	208	194	452
		22.5	208	194	452
364	424	12.5	79	44	170
		15.0	133	100	290
		17.5	155	113	333
		20.0	208	149	452
		22.5	313	181	572
424	484	12.5	83	103	186
		15.0	142	116	307
		17.5	163	180	358
		20.0	262	223	572
		22.5	313	68	683
484	544	12.5	100	127	216
		15.0	180	170	396
		17.5	242	235	530
		20.0	332	262	726

		22.5	377	-	820
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(iii) Depot rates of ples

Length class in cm.		Diameter in	Sal/Asan	Misc.	Teak
More than	Upto	cms			
(1)	(2)	(3)	(4)	(5)	(6)
544	604	12.5	187	131	409
		12.5	187	131	409
		15.0	234	162	514
		17.5	265	187	573
		20.0	377	242	820
		22.5	397	277	866
604	664	12.5	228	158	499
		15.0	247	187	517
		17.5	288	208	628
		20.0	404	281	880
		22.5	424	298	924
664	724	12.5	266	190	573
		15.0	358	251	780
		17.5	406	286	884
		20.0	436	307	950
		22.5	528	383	1152
		12.5	355	248	775
724	784	15.0	410	282	895
		17.5	496	348	1080
		20.0	645	381	1189
		22.5	601	413	1319
784	844	12.5	409	304	593
		15.5	515	352	1150
		17.5	599	413	1308
		20.0			
		22.5	720	515	1570
904	964	12.5	834	588	1820
		15.0	499	348	1088

SCHEDULE 'D'

205. (i) Firewood :- All species mixed Rs. 270.00 per m³

SCHEDULE 'E'

206. The Sale Rate of Bamboo from the Depots to purchasers fixed by the Govt. is as below.

Sl. No.	BAMBOO	RATE
1	Sarhi	Rs. 5.00 per lagga
2	Barhi	Rs. 7.00 per lagga
3	Terra	Rs. 10.00 per lagga
4	Chhaubanga	Rs. 11.00 per lagga
5	Panchbansa	Rs. 12.00 per lagga
6	Charbansa	Rs. 14.00 per lagga

SCHEDULE 'F'

207. CHARCOAL : The depot rate of Charcoal.

1	Charcoal	Rs. 1012 per stack cubic meter
2	Fencing Post	Rs. 1950.00 per Post
3	Treated Fencing Post	Rs. 30.00 per post

SCHEDULE 'G'

208. All rates indicated in the Schedules 'A' to 'F' are ex-central depot rate and are exclusive of all taxes. Taxes will be charged extra as leviable under law and rules. The above rates are applicable from May, 1996 till revised.

209. RATE FOR THE CONSUMER'S DEPOT :-

The rate of various produce sold from consumer depots are as below:-

A	Plough	Rs. 8/- each
B	Sawdust	Rs. 6 per bag
C	Yoke	Rs. 25/- each
D	Haris	Rs. 12/- each

E Firewood

Rs. 35/- per Q. in
Rural areas, Rs. 40 per
Quintal in urban areas.

210. The Corporation collects and markets the various M.F.Ps at the following rates. The collection rate of Kendu leaves for the year 1997 was Rs. 200/- per standard bag. The rate remained constant since 1991.

211. SALE FROM COUPLE DEPOTS

As per Bihar Gazette 29th August 1978 the rate for sale of forest produce from coupe depot to local right holders and non-right holders is as below:-

(i) Rate of poles and ballies (without bark at butt end)

Dia in cm	Length in m	1 st class	2 nd class	Remarks
		(a)	(b)	
0-25	0-4	0.60	0.50	(a) Teak, Asan, Sal, Karam, Pandar, Tun, Shisham and Gamhar are of 1 st Class.
	Above 4	0.70	0.60	
24-40	0-4	1.25	1.00	(b) The rest species are 2 nd class
	Above 4	1.50	1.25	
41-55	0-4	2.00	1.75	(c) Measurement at butt end mean measurement taken at 1.5 above ground.
	4-6	2.75	2.50	
	Above 6	3.50	3.00	
66-77	0-4	10.00	8.00	

(ii) Rate of logs without bark:

Measurement taken in middle. The rate below is Rs. Per in 3

76-100	0-3	105.00	60.00
	Above 3	120.00	40.00
101-120	0-3	140.00	80.00
	Above 3	160.00	90.00
Above 120	0-3	175.00	105.00
	Above 3	210.00	140.00

(iii) Rate of firewood and charcoal

Forest produce Per Quintal Per head load Per basket Per sugar Per bullock

					carts
Firewood	1.50	0.25	1.00	3.00	6.00
Charcoal	5.00	-	-	-	-

(iv) Rate of Agricultural implements

A	Plough	Rs. 2 each
B	Jaunth	Rs. 1.50 each

(v) Rate of Bamboo

(i)	Upto 2 cm dia	Rs. 12.00 per hundred	Rs. 3.00 per hundred for
(ii)	2 cm -4cm dia	Rs. 15.00 per hundred	Trees if they cut the
(iii)	4 cm- 5 cm dia	Rs. 18.00 per hundred	bamboo themselves.

CONSUMER DEPOTS

212. Some depots at urban center were to be established and materials were to be supplied from the fixed coupes of the contractors. These depots were to provide the local consumers the forest produce at reasonable price.

Thakurgaon was such a depot. later on with the introduction of State Trading the following consumer depots were opened to meet the need of firewood and of the local population :-

- (i) State Trading Ranchi Division Maclushiganj, Bijupara, Thakurgaon.
- (ii) State Trading, Lohardaga Division, Kuru, Kisko, Nadia, Mahadeo Tola, Lohardaga, Checkpost, Senha, Ghaghra & Bishunpur.

These depots were fed from various coupes and central depots and used to sale firewood, Poles, Sawn timber, Bamboo, Ploughs, Juanth etc.

WOOD CONSUMPTION :

213. The internal consumption of wood & wood products by local populations, organizations & industries has partly been estimated. The estimates of consumption has been made, recognizing the following category of wood consumers :-

- (i) By local population (a) House construction and repair (b) Agricultural Implements (c) Firewood.
- (ii) By industries (a) Coal companies, (b) Saw mills (c) Carpenters

- (iii) By other departments, (a) Irrigation (b) District authorities
- (iv) Export (a) Bihar outside Chhotanagpur (b) West Bengal.

WOOD CONSUMPTION BY LOCAL POPULATION

214. Faster scientific development and mechanization have changed the needs of many things, but it has not been able to relegate the importance of wood to a minor position in the use of mankind. It gives life to the poor and comfort to the rich. This is true for the entire country in general, and for Bihar in particular where about 50% of the population lives below poverty line.
215. Steel and cement which has been able to replace wood products in building construction has not been popular in rural areas because of high prices. Cooking gas and electric appliances are limited to certain sections of population living in cities and town. Thus wood remains the main item in house construction and fuel for most of the population.

WOOD CONSUMPTION FOR HOUSE CONSTRUCTION & REPAIRS

216. House types in India are greatly influenced by climate, economic condition and customs of the people. The technical characteristics of house construction of India as described in Monograph of housing situation of India (Natural Building Organisation, New Delhi 1959) is given below.

TECHNICAL CHARACTERISTICS OF HOUSE CONSTRUCTION IN INDIA

Plinth Area	Mud Wood	Timber Wood	Brick cement stone	Others
All rural areas	84.5 %	2.7%	12.3 %	0.5 %
All urban areas	44.5%	1.7%	53.3%	0.7%
Cities	20.2%	2.9%	78.0%	0.9%

Wall area	Mud Bamboo	C.I. Timber wood	Sheets concrete	Brick Cement	Others
All rural areas	83.4%	0.9%	15.5%		0.4%
All urban areas	42.1%	2.0%	55.2%		0.7%
Cities	21.7%	6.0%	78.1%		0.2%

Roof Reed	Straw, grass thatch, asbestos	Corrugated sheets	Cement concrete	Brick in mortar	Others
All rural areas	69.6%	23.5%	1.7%	2.4%	2.8%
All urban areas	32.9%	33.6%	19.2%	10.3%	4.0%
Cities	14.5%	27.2%	43.5%	12.5%	2.3%

HOUSE CONSTRUCTION

217. It is clear that in rural areas Kacha houses (i.e. mud wall with grass thatch and tiled roof) are more than 80% for whole of the country. The no. of Kacha houses in Bihar would be more than from all India average. It is assumed that the kacha houses in rural area are 95%. In urban areas also the Kacha houses are vey common. The above table shows that 30% to 40% of the urban houses are made of wooden materials. It is assumed that in survey area 30% of the urban houses are Kacha.
218. If the rate of growth in house construction is assumed to be uniform, the number of new houses constructed in rural & urban areas is 18,324 & 1,222 respectively. Assuming the proportion of Kacha & Pucca houses in rural areas as explained above in detail, the number of Kacha & Pucca houses which are constructed annually works out to 896 & 36 respectively.
219. The quantity of wood used in construction of a new house has been estimated on the basis of low intensity sample survey. The requirement of wood including bamboo for construction of kacha & Pucca house has been worked out on the basis of the findings of the survey & is given below.

REQUIREMENT OF TIMBER FOR HOUSE CONSTRUCTIONS

Item	No.	Requirement of Timber and Bamboo per houses		Total requirement of timber and bamboo per house	
		Timber in cm	Bamboo in tons	Timber in cm	Bamboo in Tons
Construction of Kacha House	1457	2.8660	1.90	4157.762	2768.3
Construction of	140	0.6993	-	97.902	-

Pucca House

220. Repairs of Kacha house is done quite frequently. It has been found out in the survey that repairs of Kacha houses is generally carried out at an interval of 10 years and the quantity of timbers and bamboos required is about 10% of the new house construction. The requirement of timbers for repairs incase of Pucca houses is almost negligible and therefore has been calculated.
221. The quantity of timber & bamboo required for repairs is given below.

REQUIREMENT OF TIMBER FOR REPAIR OF HOUSES, TOTAL REQUIREMENT FOR HOUSE CONSTRUCTION & REPAIRS

Item	No.	Requirement of Timber and Bamboo per houses		Total requirement of timber and bamboo per house	
		Timber in cm	Bamboo in tons	Timber in cm	Bamboo in Tons
Repair of Kacha House	9906	0.2866	.19	2839.0596	1882.14
Repair of Pucca House	-	-	-	-	-
Total	9906	0.2866	.19	2839.0596	1882.14

222. The total requirement of timber & bamboo for construction and repairs of houses in rural & urban areas has been worked out and is given below.

REQUIREMENT OF TIMBER & BAMBOO FOR CONSTRUCTION AND REPAIRING OF HOUSES

Sl. No.	Item	Requirement of Timber and Bamboo	
		Timber in cm ³	Bamboo in Tonnes
1.	Construction of Houses	4,273.6640	2,768.30
2.	Repair of Houses	2,839.0596	1,892.14
	TOTAL	7,112.7236	4,650.44

223. Almost all the species are used in house construction for one purpose or the other. Sal is generally preferred. The proportion of sal was found to be 40% in the survey. The quantity of sal & other species therefore, works out to be as under.

i)	Sal	4368	Cubic meters
ii)	Other Spp.	2745	”
iii)	Total	7113	”
iv)	Bamboo	4650	M. Tonnes

224. WOOD FOR AGRICULTURAL IMPLEMENTS

80% of the population of Bihar depends for their livelihood on agriculture. Latehar can be assumed safely to have the same percentage of population dependant upon agriculture. Wooden implements for agriculture are still common. The use of machines such as tractors, harvesters etc. is not very much seen. The important implements are plough levellor, bullock cart etc. The number of these implements with each cultivator depends mostly upon the size of holding. A farmer with small holding can have many ploughs and bullock carts. The distributions of the size of holding in the Division are given below.

SIZE OF HOLDING IN THE AREA

Sl.No.	Area in Hectare	Percentage	No. of Household
1	Less than 1	55	49960
2	1-5	25	22710
3	5-10	15	13625
4	10-25	4	3635
5	More than 25	1	908
	Total	100	90836

225. The total number of ploughs, levelers, and bullock carts have been calculated on the basis of following assumptions.

CULTIVATOR WITH HOLDING AND THE NUMBER OF IMPLEMENTS

Sl. No.	Status of the Cultivator's Houses	No. of agricultural implements	Plough	Leveller	Bullock cart
1	Less than 1	49960	1	0.5	-
2	1-5	22170	1	1	-
3	5-10	13625	2	1	-

4	10.25	3635	3	1	1
5	More than 25	908	4	2	1

226. The total number of ploughs levelers and the quantity of timber required has been worked out and is given below.

Sl. No.	Item	Number	Quantity of timber required per unit (m) ³	Quantity of timber required in m ³
1	Plough	1,14,570	0.140	16,023.98
2	Levellors	66,766	0.150	10,682.27
3	Bullock cart	5,451	0.566	3,085.27
	Total			29,791.80

227. The life of agricultural implements depends upon its use. It is expected that cultivators with small holding will not be able to provide sufficient work to the agricultural implement. Therefore, the life of the, agricultural implements would be comparatively higher. It is assumed that the average life of a plough, leveler and a cart is 2 years, 4 years and 6 years respectively.

228. The most common process of getting the ploughs and levelers is to fell single large tree illegally and fashion two plough or one leveler from each tree by axe. These are sold in local markets as well as used by the villagers.

ANNUAL REQUIREMENT OF WOOD FOR AGRICULTURAL IMPLEMENT

Sl. No.	Item	Annual requirements of timber m ³
1	Plough	8017.99
2	Leveller	2,670.64
3	Bullock cart	574.21
	Total	11,196.84

229. The important species used are sal, sain, khair, sidha, kendu, dhawra, sandan etc. The proportion of sal and other species in use is about 20% and 80% respectively. The quantity of sal and other species works out as under :-

Sal	-	6718 M ³
Other species	-	4478 M ³
Total	-	11,197 M ³

FUEL REQUIREMENT

230. Wood serves the purpose of domestic as well as industrial fuel. The share of commercial fuel in rural India is very little. According to a survey conducted by National Council of Applied Economic Research, the total consumption of commercial fuel in rural India is hardly 5.5%, the noncommercial fuels, such as fire wood, baggasse, saw mill waste, cowdung, agricultural waste etc. are largely used. The percentage consumption of agriculture non-commercial fuels for Bihar is given below:-

PERCENTAGE CONSUMPTION OF NON-COMMERCIAL FUELS

Sl. No.	Fuel	Percentage
1.	Firewood	64.3
2.	Dung Cake	17.6
3.	Agricultural waste	17.5
4.	Coal, gas etc.	0.6
	TOTAL	100

231. The area predominantly consists of rural population. The firewood remains a major source of energy, because fire wood is used not only for cooking but also for heat in absence of proper and sufficient clothing.

232. The sample survey conducted in 1973 in order to find out the per capita consumption of the fuel wood. The survey as revealed that annual per capita consumption of fire wood in rural wood in rural and urban area work out as under on the basis of 1991 population.

FUEL CONSUMPTION IN RURAL AND URBAN AREASB

Sl. No.	Item	Population 1991	Percentage	Per capita per year consumption in tones	Total consumption in tonnes
1.	Rural	6,06,913	34.3	0.264	1,03,024.69
2.	Urban	31,737	64.3	0.189	3,856.90
	TOTAL	6,38,650			1,06,881.59

On considering $4\text{m}^3 = 1\text{ MT}$, the firewood required is $4,27,526\text{ m}^3$. Considering the crop consumption of forests around 60% comes from Sal and 40% from the other species.

233. The use of vegetable waste such as dried woody part of Arhar (*Cajanus cajan*), castor (*Riccinus communis*), Jowar (*Sorghum* spp) and stock of other species are very common. Some of the firewood is obtained from the trees growing in agricultural lands. According to survey conducted by National Council of Applied Economic Research, 1961, the share of vegetable waste is about 18% of the total fuel requirement. Besides these materials Saw Mill waste. Salvaged wood from old houses, shades, packing cases, fencing etc. are used as firewood. Trees growing on agricultural land, also yield firewood. The removal of firewood from the forest consists of almost all available forest species. It includes lops and tops, branch wood, bark twigs, decayed wood etc. The portion of the trees below 5cm is also used as firewood.

SUMMARY OF TOTAL WOOD CONSUMPTION IN THE YEAR

Sl. No.	Item	SPECIES		
		Sal (m^3)	Others (m^3)	Total Bamboo (m^3) tonnes
1.	House construction and repair	4568-2747	7113-4650	
2.	Agricultural implements	-6718	4479-11197	-
3.	Firewood	2.56516	171010	427526
	TOTAL	11086	7224-18310	4650
		Timber : 1831m^3		

Bamboo : 4650m Firewood : 427526m^3

234. The future demand of commodity is governed by various factors such as growth in population, change in income, price trend of various consumer goods, change in technology, availability of substitutes, literacy, consumer preferences etc. The future demand should be calculated taking into consideration these factors.
235. The effect of the population upon consumption is assumed to be uniform and quantitative relationship of income and consumption of wood products has indicated a positive correlation

through out the world higher the level of per capita income, the higher elasticity co-efficient of income which is given below:-

$$\text{Income Elasticity Co-efficient} = \frac{\% \text{ change in qty. Consumed}}{\% \text{ change in income.}}$$

236. Price is another important factor. Any realistic forecast has to take into consideration the price of the commodities. Prohibitive price discourages the use, and substitutes are then searched and if proper substitutes are found, the market is lost. Growth in population tends to raise the demand. If production is fixed and the costs are stationary, a raise in basic demand caused by increase in population or in the standard of living will raise the price vertically. The other factors which affect the demands are change in technology, consumer preferences, literacy etc. which are difficult to evaluate and are beyond the scope of study.

PROJECTION OF DEMAND

237. It is proposed to forecast the demand for 2001. The projection of demand of wood has been made by the following formula :-

$$\text{Log } Y, = 0.4343 \text{ X I.E. (I-X) = 0.1535}$$

Where Y, = Per capita consumption at target date

I.E, = Income Elasticity

X = Per capita income at starting point

X, = Per capita income at target date.

0.4343 is a constant which is derived by F.A.O. from cross-sectional date. Income Elasticity factor is taken as 0.8

therefore $y_1 = y \text{ anti log of } .1535 = 1.4254y$

POPULATION ESTIMATES

238. The population of the area according to 1991 census is 638650 as against 425971 in 1971 representing 2.496 growths per annum in the population. The population for the year 2001 projected thus work out to be as under :-

Populatin estimates for 2001=7,98,057

INCOME ESTIMATES

239. From available figure the per capita income of Bihar during 1968-69 is 231.60 at 1960-61 price level. The same figure has been adopted for the survey area.

The income growth per year from 1960-61 to 1968-69 work out to be 0.75%. In view of several development activities under 4th, 5th, 6th, 7th and 8th five year plans it is assumed that income growth per year between 1971 to 1981 and 1981 to 1991 and 1991 to 2001 would be 4% and 6% respectively. Therefore, per capita income of the area for the year 1991, 2001, 2011 work out to be as under :-

Per capita income in 1991 Rs. 662.00
 Per capita income in 2001 Rs. 1186.00
 Per capita income in 2011 Rs. 1257.00

FORECAST FOR WOOD CONSUMPTION

240. Using the formula discussed in paragraph the demand of wood for house construction, repair and agricultural implements has been taken and quantity of fuel wood has been projected on the basis of population only. The quantity of wood required for house construction and repairs agricultural implements and for fuel has been summarized above.

PROJECTED DEMAND OF WOOD FOR THE YEAR 1991 AND 2001

Year	Timber in m ³	Firewood in m ³	Bamboo in mt
1991	18310	427527	4650
2001	26073	608797	6622
2011	37129	866927	9430

241. The forestry operations are labour oriented. The rate for different items of logging and other operations fixed by the State Trading Organization in Ranchi State trading circle for 1997-98 is as following:-

<u>Sl. No.</u>	<u>Particular of Items</u>	<u>Rate</u>
(i)	Clearance of coupe line	Rs. 9%
(ii)	Felling of trees, conversion into pieces, and carriage of such materials to the transporting site including the cost of dressing of stumps.	
	(i) For Coppice Coupe.	Rs. 134 per m ³
	(ii) For Selection and Salai.	Rs. 140 per m ³

(iii)	Construction of extraction path :-	
	(a) For general Coupe	Rs. 38.00 per m ³
	(b) For hilly Coupe (after D.F.O.s sanction)	Rs. 38.00 per m ³
	(c) For fuel Coupe only	Rs. 4.60 per m ³
(iv)	For fire protection measures	Rs. 5.00 per m ³
(v)	Sundry expenses (For taking measurements, cost of carbon, paper, registers chalk, coaltar, paint etc.)	Rs. 5.00 per m ³
(vi)	For making hut	
(vii)	Making and collection charges of Khuta, rubble and poles	
	(a) Khuta (2.44m to 3.64m)	Rs. 0.70 per inch dia
	(b) Rolls (3.65m to 5.48m)	Rs. 1.05 per inch dia
	(c) Pole (5.49m to 7.31m)	Rs. 1.35 per inch dia
	(d) Pole (7.32m to 8.53)	Rs. 1.80 per inch dia
	(e) Pole (8.54m to 9.15)	Rs. 1.95 per inch dia
(viii)	Making and collection charges of tramline and coggen:-	
	(i) For 4' long (round)	Rs. 1.05 each
	(ii) For 4' long (Axed two sides)	Rs. 1.25 each
	(iii) For 5' long (Not axed)	Rs. 1.15 each
	(iv) For 5' long (Axed two sides)	Rs. 1.35 each
	(v) For fencing post.	Rs. 1.95 each
(ix)	Charges for making and collection of fuel wood on loading side:-	
	(a) For plain coupe	Rs. 12.00 per m ³
	(b) For hilly coupe.	Rs. 12.00 per m ³
(x)	Making charge of charcoal including the cost of cutting conversion and carriages of firewood to the kiln site.	Not allowed
(xi)	Coppicing Charges (Excluding the charge for selection coupe)	Rs. 3000 per m ³
(xii)	Loading charges of forest produce on truck and unloading them in the depot.	
	(a) Timber	Rs. 28.00 per m ³

(b) Fuel Wood Rs. 6.30 per m³

FOR DEPOT

- (i) Charges for siding and making lots of timber Rs. 38.00 per m³
- (ii) Charges for collection and making lots of fuel wood Rs. 4.05 per m³
- (iii) Making charcoal/side cut lots Rs. 2.00 per m³
- (iv) Charges for making lot of bamboos (including the cost of strings and typing the bamboos into bundles) Rs. 20.00 per ton
- (v) Protection from fire (including cost of fire extinguisher) Rs. 2.25 per m³
- (vi) Stacking of poles, fencing post writing their measurement etc.
- (a) Upto 300 cm Rs. 35.00 per hundred
- (b) 301 cm to 450 cm Rs. 59.00 per hundred
- (c) 451 cm to 600 cm Rs. 70.00 per hundred
- (d) above 601 cm Rs. 84.00 per hundred

SAW MILL

- (vii) (i) Sawing charges of T.L. Cogging Rs. 0.28 each
- (ii) Collection charges of T.L., Cogging after sawing Rs. 0.15 each
- (iii) Saving charges of cogging Rs. 0.39 each
- (iv) Stacked charges of cogging Rs. 0.17 each
- (viii) Sundry expenses in depots (cost of paper, pencil, carbon, pen, colour and taking of measurements) Rs. 175.00

FOR BAMBOO COUPES:-

- (i) Clearance of boundary lines Rs. 2.60 per metric ton which ever less
- (ii) Construction of extraction path Rs. 18/- per M.T. or Rs. 390.00 per (subject to the maximum amount of Rs. 4200/- per coupe
- (iii) Cleaning charges of bamboo clumps Rs. 0.50 each clumps or Rs. 18.20 metric ton which ever is less
- (iv) Making charges of temporary hut RS. 420.00 each hut
- (v) Fire protection measure Rs. 3.90 per metric ton which ever less

- (vi) Cost of string for making bundles Rs. 14.00 per metric ton
- (vii) Other expenses (Cost of paint and coaltar etc.) Rs. 980.00 per coupe or Rs. 5.60 per metric ton which ever less
- (viii) Making cost of damaged clumps Rs. 10.00 per metric ton or Rs. 0.40 per clump which ever is less

COLLECTION OF SEEDS

242. The collection charges for the year 1989 for the following kind of seeds are as follows:-

Sl. No.	M.F.P.S.	Collection				Rates			
		1986	1987	1988	1989	1990	1991	1992	
1	2	3	4	5	6	7	8	9	
(i)	Sal seeds	1.20	1.20	1.20	1.20	1.30	1.30	1.30	
(ii)	Mahua seeds	3.50	3.50	3.50	3.50	5.75	5.75	5.75	
(iii)	Karanj seeds	1.75	1.75	1.75	1.75	4.00	4.00	4.00	
(iv)	Palas seeds	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
(v)	Kusum seeds	1.50	1.50	1.50	1.50	1.50	1.50	1.50	
(vi)	Amla seeds	0.75	0.75	0.75	0.75	1.00	1.00	1.00	
(vii)	Bahera nuts	0.50	0.50	0.50	0.50	0.70	0.70	0.70	
(viii)	Harra nuts	0.60	0.60	0.60	0.60	1.20	1.50	1.50	
(ix)	Jaungi-Harra	2.50	2.50	2.50	2.50	2.75	2.75	2.75	
(x)	Mahulan leaves	-	-	0.80	0.80	0.80	0.90	0.90	

COLLECTION OF KENDU LEAVES

243. The rate for collection of kendu leaves from the year 1973 to 1991 per standard bag is given below :-

Year	Rate in Rs. Per st. bag	Year	Rate in Rs. Per st. bag
1973	17.50	1974	17.50
1986	65.00	1987	65.00
1995	20.00	1976	20.00
1977	20.00	1978	22.50
1979	27.00	1980	27.50

1981	35.00	1982	40.00
1983	44.00	1984	50.00
1988	65.00	1988	81.00
1990	90.00	1991	200.00
1992	200.00	1993	200.00
1994	200.00	1995	200.00
1996	200.00	1997	200.00

SCHEDULE OF RATES OF FOREST PRODUCE FOR RANCHI WEST DIVISION APPROVED BY THE COMMISSIONER OF SOUTH CHOTANAGPUR DIVISION IN HIS LETTER NO. 1827 R, DATED 12TH FEBRUARY, 1978, 2ND REVISED BY HIS LETTER NO. 349 DATED 25.08.1989.

DEFINITIONS OF TIMBER AND FIREWOOD AND RULES FOR MEASUREMENT AND CLASSIFICATION OF TIMBER

A. DEFINITIONS

1. TIMBER :

Broadly defined Timber is any piece of wood which is for use or is commonly used for purposes other than for burning as firewood. Specially, all sawn wood of whatever size, or all wood shaped or fashioned with axe or other instrument. Also any piece of sound unfashioned wood which exceeds either 1.5 (5') in length or 30 cm. in girth measured over bark at the middle is Timber.

2. Round Timber is defined as Timber which has not been squared in any way.

3. Axed Timber is defined as Timber from which the whole or part of the sap wood has been removed with the axe.

4. Logs are defined as round timber of which the girth at the butt end is = 1m (36") or more over bark, "Do-pahal" is half a log divided into two pieces length and a "chaupahal" is quarter of a log similarly divided.

5. Poles, rollas or ballies are defined as round timber of which the girth at the butt end is less than 1m (36") measured over bark.

6. Slabs or bakals are segments sawn off in squairing the round timbers. Any piece or partly round timber from which a scantling 1.83 x 1.25 cm (6'x0.6" x0.6") or more can be obtained will not be classed as a slab but as a "do-pahal".
7. Slab, wasp, edge, planned or turned are pieces of timber not exceeding 1.5m(4') in length and 25.40 cm.(10") in girth.
8. Battons, or battas, sawn, edge, planed or turned are pieces of timber not exceeding 2m. (7") in length and 25.40 cm(10") in girth.
9. FIREWOOD :-
Firewood includes all dry round pieces of wood standing or fallen not exceeding 1.83m (6") in length or 30cm (12") in girth at butt end. Firewood is any wood that is commonly used for burning as fuel and does not fall within any one of the definitions of timber.
10. RULES FOR MEASUREMENT :-
In measurement the length of timber of anything under 15 cm (6") will be omitted whilst 15cm (6") and over up to 30 cm. (12") will be counted as 30cm (1")
 - (a) The volume of a broad guage sleeper measuring 2.75 mm x 25.40cm x 12.70 cm(90m x25). 40cmx12.70cm (9"-6" x 10"x5") will be considered as 0.094m³ (3.3cft) 3.05mx25.40cmx12.70cm (10"x5") will be considered as 0.99m³ (3.3 cft)
 - (b) The volume of metre gauge sleeper (normal measurement 1.83m x20.32cmx11.43cm (6x8"x4.60") will be considered to be 0.3m³ (1.50cft) provided its measurement do not exceed 1.98m x 21.59cms x12.70cms (6-6"x8-6x5").
 - (c) The volume of narrow guage sleeper measuring 1.53m x 17.78cmx11.43cm (5"x7"x4"-6") will be considered 0.029m³ (1.00 cft).
11. The measurement of logs should be taken under bark and that of poles both standing and felled should be taken over bark. In case of dry poles whose barks have been peeled off by natural causes, the measurements if necessary is to be taken under bark.
12. The above definitions of timer and fire wood are however, affected largely by the locality where the wood may be found, the economic value of the species or trees, local custom and usage, unsoundness of wood, ccrookedness or other blemishes. Therefore, at the discretion of the Divisional Forest Officer a piece of wood that would ordinarily be timber or may for the reasons stated above be declared to be fire wood or viceversa.

In all doubtfull cases generally and in all cases of dispute whether a particular piece of wood should be classed as Timber or Fire wood, the decision of Divisional Forest Officer shall prevail.

13. Poles as ballies and small unaxed round timber will be measured at the butt or thick end.
14. All calculations will be made according to Mr. Mercer's table.

B. CLASSIFICATION OF SPECIES

1. For the purpose of royalty calculation on timber, various species of trees are classified as follows:-

CLASS I :- Sal (*Shorea robusta*) sissou (*Dalbergia latifolia*), Bandhan or panjan (*Ougenia dalbergoides*) tun (*Cedrela toona*) Gamhar (*Gmelina arborea*), Bheru (*Chloroxylon sweetenia*), Piasal (*Pterocarpus marsupium*), Dhaman (*Grewia latifolia*), Khair (*Acacia catechu*).

CLASS II :- Arjun (*Terminalia arjuna*), as an (*Terminalia tomentosa*), Jamun (*Syzygium cumini*), Karam (*Adina cordifolia*), Sonar (*Cassia fistula*), Kendu (*Diospyros melanoxylon*) and other miscellaneous species.

For any other species to be included, the decision of the Divisional Forest Officer final.

1. Royalty rates for unaxed poles, ballies, green or dry.
2. (Measurement taken over bark at butt end), in Rs. (Girth in Centimeter)

KIND	Class	0 to 25 cm	25 to 40	40 to 55 cm	55 to 65 cm
Poles, ballies Rollas and unaxed timber		0"-10" (in Rs.)	cm 10"-16" (in Rs.)	17" -22" (in Rs.)	22" -26" (in Rs.)
1	2	3	4	5	6
(a) Upto 4m length upto 12' in length	I	1.70	3.40	5.00	10.15
(b) 4m length	I	2.20	5.00	8.00	15.75
(c) Upto 4 m in length	II	0.45	1.00	1.50	3.00
(d) Above 4m in length	II	0.70	1.50	2.25	4.50

(II) Measurement takne under bark and butt end.

(a) Upto 4m length (12' in length)	I	0.90	1.75	2.75	5.00	10.00
(b) Above 3m length	I	1.10	2.50	3.75	7.50	14.00
(c) Upto 4 m in length	II	0.50	1.25	1.75	3.50	7.00

(d) Above 4m in length II 0.75 1.75 2.50 5.00 10.00

2. Royalty Rate For Logs (Green or dry)

Measurement taken under bark at the middle of log.

(Rate for cubic metre)

Girth Class	Length	Class I	Class II
1. 70 to 100 cms	(i) 0 to 3 cm	Rs. 175/- cums (Rs. 5/-)	Rs. 105/- cum (Rs. 3cft)
	(ii) above x 3m to 6m	Rs. 210/- cums Rs. 6/- cft	Rs. 140/- cum (Rs. 4 cft)
2. 101 to 120 cms	(i) 0 to 3m	Rs. 210/- cums (Rs. 6/- cft)	Rs. 140/- cum (Rs. 4cft)
	(ii) 3m to 6m	Rs. 245/- cum (Rs. 7/- cft)	Rs. 158/- cum (Rs. 4.50cft)
	(iii) 6m & above	Rs. 245/- cum (Rs. 7/- cft.)	Rs. 175/- cum (Rs. 5 cft)
3. 212 to 150	(i) 0 to 3m	Rs. 245/- cum (Rs. 7/- cft.)	Rs. 175/- cum (Rs. 5 cft)
	(ii) 3 to 6m	Rs. 280/- cum Rs. 8/- cft	Rs. 192/- cum (Rs. 5.50 cft)
	(iii) 6m to above	Rs. 315/- cum (Rs. 9/- cft)	Rs. 210/- cum (Rs. 6cft)
4. Above 150 cms	(i) 0 to 3m	Rs. 315/- cum (Rs. 9/-)	Rs. 210/- cum (Rs. 6cft)
	(ii) 3 m to 6 m	Rs. 350/- cum (Rs. 10/- cft)	Rs. 245/- cum (Rs. 7cft)
	(iii) 6m & above	Rs. 420/- cum (Rs. 12/- cft)	Rs. 280/- cum (Rs. 8cft)

3. Royalty for firewood, charcoal and brush wood.

1. Per head load	Rs. 0.50	Rs. 1.60	Rs. 0.20
2. Banghi Load	Rs. 1.00	Rs. 3.20	Rs. 0.40
3. Cart Load	Rs. 6.25	Rs. 20.00	Rs. 2.00

4.	Cart Load	Rs. 12.50	Rs. 40.00	Rs. 4.00
5.	Per quintal	Rs. 1.25	Rs. 4.00	

NOTE : One truck load is equal to 10 cart loads and one head is equal to 0.40 quintal.

4. Royalty rate for Bamboos.

- i. Bamboo 0 to 50 length Rs. 20.00 per hundred Over to 5 m length Rs. 25.00 per hundred.

5. Royalty rate for grazing in the Forest area :-

- i. Per buffalow Rs. 10.00 per annum for the season
- ii. Bullock and cow. Rs. 4.00 per annum for the season
- iii. Goats and sheep Rs. 2.00 per annum for the season

6. Royalty rates for Agricultural implements and the house hold articles.

- i. Plough Rs. 1.00 each
- ii. Yoke (Juath) Rs. 1.00 each
- iii. Sarh Rs. 0.75 each
- iv. Bhangi Rs. 0.25 each

NOTE : Rates for other materials will be calculated on the basis of rates of poles and Timber mentioned above.

7. Royalty rates for other kinds of Minor Forest Products.

Sl. No.	Description	Rate			
		Head Load	Banghi Load	Sagar Load	Cart Load
1	Thatch and fodder grass	0.25	0.50	1.50	2.50
2	Sabai grass	1.00	2.00	10.00	18.00
3	Baroon grass	1.00	2.00	10.00	18.00
4	Myrobolans	1.00	2.00	-	-
5	Date leaves	0.25	0.50	-	-
6	Bauhinia leaves	0.25	0.50	-	-
7	Chope	2.00	4.00	-	-
8	Bark for tanning	6.00	12.00	-	-

8. Royalty for lac and cocoon cultivation

- | | | |
|------|--|----------|
| i. | Lac cultivation on kusum trees annually per tree | Rs. 2.00 |
| ii. | Lac cultivation on palas and ber annually per tree | Rs. 1.00 |
| iii. | Rearing of cocoons annually per tree | Rs. 0.50 |
| | Royalty rates for minor minerals etc. | |

9. Royalty rates for stones, sand, etc for any other purpose than commercial use for which the rates shall be governed by the Bihar Minerals Concession rules as amended from time to time.

Sl. No.	Name of Minerals	Rate per cum.
1	Building stones including stone chips	Rs. 2.50
2	Gravel	Rs. 1.75
3	Ordinary day	Rs. 0.60
4	Ordinary and other than sand used for prescribed purpose indicated below:- (i) Purpose of refractory and manufacture of ceramic. (ii) Metallurgical purpose. (iii) Optical purpose. (iv) Purpose of stocking in coal mines. (v) For manufacture of sodium silicate. (vi) For manufacture of pottery and glass.	Rs. 1.25
5	Boulder	Rs. 1.75
6	Shingle	Rs. 1.75
7	Chalcedony pubnle used for ball mill purpose only	Rs. 1.75
8	Lime shell Kankar and Limestone used in kilns for manufacture of lime used as building materials and lime shell used for manufacture of buttons	Rs. 4.50
9	Murram	Rs. 4.50
10	Brick earth	Rs. 1.75
	Equivalent 400 standard bricks	
11	Fullar's earth	Rs. 4.50
12	Bentonite	Rs. 4.50
13	Road Metal	
	(a) Ballast	Rs. 1.75
	(b) Stone Chips	Rs. 2.50
14	Reh-Matti	Rs. 4.50
15	Slate and shale when used for building material	Rs. 8.00
16	Marble (MIX -153)/57 dt. The 3 rd sept. 1959)	Rs. 4.50
17	Stones used for making house hold utensil including grinding stones	Rs. 8.00
18	Quartzite and Sandstone when used for purpose of building or for making road metal and house hold utensil (OSR 341 dt. The 6 th March, 1965)	Rs. 2.50
19	Salpetre (Gur 124, dated the 28 th January, 1967)	Rs. 8.00

(As per rates mentioned in the Bihar Minor Minerals Concession rules, 1972)

NOTE :- If some new types of produce come to light and market is created the rates shall be fixed by the Divisional Forest Officer in his jurisdiction and that shall be final. The rates of any other Forest produce which is not included in the schedule shall be finalized by the Divisional Forest Officer, from time to time.

Royalty Rate of Khair and Katha as approved by the Commissioner South Chhotanagpur Division, Ranchi vide his letter no. 349 dated 25.08.89.

		Rates of poles			
(A)	(1) For poles	Girth		Class	
		0-25cm	25-40cm	40-55cm	55-65cm
1.	Upto 4 metre	Rs. 1.70	Rs. 3.40	Rs. 5.00	Rs. 10.15
2.	4 metre and above	Rs. 2.20	Rs. 5.00	Rs. 7.90	Rs. 15.75
				OR 8.00	

Rate of royalty of forest produce under the Forest (Conservation) Act, 1980 (vide C.C.F. Development's Office order no. 36, dated 02.03.96)

The rate of royalty for various forest produce for 1995-96 has been fixed after increasing 50% of rate fixed by the office order no. 48 dated 03.08.1991 of the Chief Conservator of Forest, Conservation and Management, Ranchi for the year 1996-97 the rate is to be 10% higher to that of 1995-96.

1. **TIMBER** : For the assessment of value of the timber every tree except Khair above 20 cm dbh overbark or 65 cm gdh overbark will be enumerated, Khair will be enumerated to a minimum of 10 cm dbh or 30 cm dbh ovr bark. Value of timber according to the species and dia/girth classes is given in table-I.
2. **POLE** : Except Khair every tree of all species above 10 cm dbh or 30 cm dbh over bark will be enumerated. The assessment of value of poles will be made on the basis of dbh class as shown in the table II.
3. **FIREWOOD** : All trees and small wood below 10 cm dbh overbark will be taken as firewood. The per hectare royalty of firewood for various densities of forest is given in table-III.

4. BAMBOO : Every clump will be enumerated –Number or clumps will be assessed after enumeration of every culm in 5% clumps selected by random sampling. Rate of various categories of bamboo (lagga) is given in table –IV.

The above enumeration list and its abstract in diameter class/grith classes with the proposal of diversion of forest land will be submitted to the Chief Conservator Forest, Development.

5. KENDU LEAF : The value of the kendu leaf available on the land proposal transfer will be arrived as below:-

Area of the proposed land	X Standard yield of KL Unit X
Area of the concerned KL unit	

Value per std. bag

The standard yield of the Unit will be the notified yield for 1995 and the value per standard bag will be 50% of the rate of labour for primary collection.

6. FOODER : The minimum annual yeield of natural fooder per hectare is 12.5 quintal which is the grow production of fodder for the two cutting cycles (September and February). The value is fixed Rs. 7.50 per quintal i.e. Rs. 98.25 per hectare.
7. PLANTATION : A separate order is to be issued for rate of royalty related to aforesaid forest land.

Royalti of Timber

Species : **Sal** (*Shorea robusta*)

Dia O.B. in cm	Girth O.B.in cm.	Volume M ³	Rate Rs. M ³	Amount	Remarks
20-30	65-95	0.142	2475.00	352.00	-
30-40	95-130	0.240	4500.00	1080.00	-
40-50	130-160	0.764	5850.00	4470.00	-
50-60	160-170	1.104	7425.00	8198.00	-

60-70	190-220	1.194	8100.00	9672.00	-
70-80	220-250	3.751	8100.00	30,384.00	-
80-90	250-280	5.649	8100.00	45,751.00	-

Sagwan (*Tectona grandis*)

20-25	63-78	0.113	4500.00	509.00
25-30	78-93	0.156	4500.00	702.00
30-35	93-109	0.396	4500.00	1782.00
35-40	109-125	0.523	4500.00	2354.00
40-45	125-140	0.679	7875.00	5348.00
45-50	140-155	1.161	7875.00	9143.00
50-55	155-170	1.402	7875.00	11041.00
55-60	170-185	1.642	7875.00	12931.00
60-65	185-200	2.350	10462.50	24587.00
65-68	200-215	2.675	10462.50	31262.00
73-78	230-245	2.355	14175.00	47558.00
78-83	245-260	3.667	15075.00	55280.00

Bija (*Pterocarpus marsupium*) Gamhar (*Gmelina arborea*)

20-30	65-95	0.210	2475.00	520.00
30-40	95-130	0.473	5175.00	2448.00
40-50	130-160	0.930	6525.00	6069.00
50-60	160-170	1.758	8100.00	14240.00
60-70	190-220	1.250	9112.00	20504.00

SHISAM (*Dalbergia sisoo*)

20-30	65-95	0.113	2250.00	255.00
30-40	95-130	0.408	3487.00	1423.00
40-50	130-160	0.630	4950.00	4604.00
50-60	160-190	1.740	5850.00	10,179.00
60-70	190-220	2.830	6412.00	18,148.00

Asan (*Terminalia tomentosa*), Tun (*Cderela toona*), Kaj (*Bridelia*),

Siris, Anjan (*Ougenia*)

20-30	65-95	0.143	1800.00	258.00
30-40	95-130	0.547	1800.00	258.00
40-50	130-160	1.168	2925.00	3400.00
50-60	160-190	2.115	2925.00	6187.00
60-70	190-220	3.496	3375.00	11,799.00
70-80	220-250	4.594	3375.00	15,504.00
80-90	250-280	5.723	4275.00	24,466.00

Karma (*Adina cordifolia*)

20-30	65-95	0.084	3375.00	284.00
30-40	95-130	0.386	3375.00	1,303.00
40-50	130-160	0.836	4950.00	4,149.00
50-60	160-190	1.477	4950.00	7,312.00
60-70	190-220	2.340	4950.00	11,583.00
70-80	220-250	2.660	5175.00	13,766.00
80-90	250-280	4.878	5175.00	25,244.00
90-100	280-310	5.934	5512.00	32,712.00

Dhaura (*Anogeissus latifolia*) and other species out of this list

10-20	30-65	0.136	1350.00	184.00
20-30	65-90	0.542	1575.00	854.00
30-40	90-130	1.268	2250.00	2853.00
40-50	130-160	2.714	2700.00	7328.00
50-60	160-190	3.763	3375.00	12,701.00

Semal (*Bombax ceiba*)

20-30	65-95	0.165	1350.00	223.00
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30-40	95-130	0.375	1575.00	591.00
40-50	130-160	1.164	2250.00	2619.00
50-60	160-190	1.602	2700.00	4326.00
60-67	190-210	1.868	2700.00	5044.00
67-77	210-245	2.407	3375.00	8124.00
77-87	245-275	2.860	3375.00	9653.00

1	2	3	4	5	6
20-30	65-95	0.187	1800.00	337.00	Eucalypus
30-40	95-130	0.255	1800.00	459.00	
40-50	130-160	0.46	2962.00	1363.00	

Chilbil (*Holoptelia integrifolia*) and other species out of this list

20-30	65-95	0.084	1350.00	114.00
30-40	95-130	1.430	2250.00	3218.00
50-60	190-220	2.590	2700.00	6993.00
70-80	220-250	4.590	3325.00	15495.00
80-90	250-280	6.328	3375.00	21357.00

Khair (*Acacia catechu*)

10-15	30-45	0.56	2850.00	60.00
15-20	45-65	0.084	7147.00	601.00
20-30	65-95	0.126	8505.00	1072.00
30-40	95-130	0.353	9525.00	3363.00
40-50	130-160	0.748	5925.00	7125.00
50-60	160-190	1.385	3825.00	13193.00
60-70	190-220	2.307	9525.00	21975.00

Salai (*Boswellia serrata*)

20-25	65-80	0.185	1237.50	229.00
25-30	80-95	0.364	1237.00	476.00
30-35	95-115	0.667	1462.50	976.00

35-40	115-130	1.097	1462.50	1605.00
40-45	130-145	1.402	1462.50	2051.00
45-50	145-160	1.747	1688.00	2949.00
50-55	160-175	2.314	1800.00	4166.00
55-60	175-190	2.826	1800.00	5087.00
60-65	190-205	3.392	2137.00	2751.00

Jhingan (*Lannea Species*)

20-30	65-95	0.352	1237.50	436.00
30-40	95-130	0.886	1462.50	1296.00
40-50	130-160	1.660	1462.50	2428.00
50-60	160-190	2.007	1800.00	3613.00
60-70	190-220	3.226	2137.50	6896.00
70-80	220-250	4.988	2137.50	10662.00
80-90	250-280	5.970	2137.50	12761.00

Revenue of Poles

All measurement on breast height and O.B.

Rate per pole in Rupees

Density of Forest	Available fire wood per Hectare in m ³	Rate per	Revenue for hectare
0.1	40	18.75	6750.00
0.2	50	18.75	8438.00
0.3	60	18.75	10,125.00
0.4	50	18.75	8,435.00
0.5	40	18.75	6,750.00
0.6	30	18.75	5,063.00
0.7	30	18.75	5,063.00

Revenue of Bamboo

Kinds of Bamboo	Rate of each bamboo in rupees	Kinds of Bamboo	Rate per bamboo
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SARHI	2.25	CHHOBANSA	6.00
BARHI	4.50	PACHBANSHA	6.25
MERA	5.25	CHARBAHA	6.75

