

PART-II
FUTURE MANAGEMENT DISCUSSED AND PRESCRIBED

CHAPTER - I

GENERAL OBJECTS OF MANAGEMENT

The general objects of management are -

- (i) To maintain, improve and protect the forest cover specially on the hills for prevention of soil erosion, conservation of the rain water and improvement of local water-supply.
- (ii) To meet the bona-fide requirement of the right holders for timber, fuel, grazing and other forest produce to the extent possible, and to market the surplus for consumption by the local inhabitants' who have no right and also to export to other markets if possible.
- (iii) To associate in increasing degree the local population with the protection and scientific management of the forests and foster a sense of community owner-ship.
- (iv) To improve the existing forests by suitable silvicultural treatment and to prevent soil erosion.
- (v) To utilize fully the vast wealth of major and minor forests produce; and
- (vi) Consistent with the above, to have sustained yield of timber, fuel and other forests produce for future.

CONSTITUTION OF WORKING CIRCLES

REASONS FOR THE FORMATION AND GENERAL TREATMENT

To attain the objects of management, the forest have been divided into working circles according to the composition, density, situation and silvicultural needs of the forests and local requirements. Accordingly the under mentioned working circles have thus been formed.

- (1) Coppice with standard working circle
- (2) Coppice-selection working circle
- (3) Rehabilitation and soil conservation working circle
- (4) Plantation working circle
- (5) Wild life working circle
- (6) Protection working circle.

(1) Coppice with Standard Working Circle

The coppice with standard working circle comprises all the forests fit for working under this system, both right free as well as right burdened which can be grown and economically exploited to meet the demand of the right holders, the non-right holders and for export wherever possible. The total area allotted to this working circle is 98940.56 acre/ 39576.22 hector.

(2) Coppice selection working circle

The coppice selection working circle comprises all the forest on hikll and steep slopes where coppice regeneration has failed or is likely to fail, and where the demand for small sized produce is meager. The total area allotted to this working circle is 20502.43 acre /8200.97 hect.

(3) Rehabilitation and soil conservation working circle

Rehabilitation and soil conservation working circle comprises all the areas in which the crop is in need of rehabilitation. Where extensive areas of sal and miscellaneous rooted wastes exist which need protection against unregulate4d cutting, grazing and fire. They need to be improved by cutting back, fencing, proper tending operations, sowing and planting by suitable spp. as ant erosion measures. The total area of this working circle is 44574.52 acres/17829.80 hectares.

(4) Plantation Working circle

Plantation working circle embraces all the planted areas, all plantable areas and such of sal and miscellaneous rooted waste areas which

needs partial planting. The total area allotted to this working circle is 34608.68 acra/ 13843.43 hectares.

(5) Wild Life working circle

To preserve the unique gift of nature a wild lif sanctuary has been set up at Dalma Hills. The Dalma wild life sanctuary comprises the forests of Dhalbhum Division and Chaibasa North Division. It contains most of the important felling series of Mango Range in Dhalbhum Division. A separate management plan for a Dalma wild life sanctuary's has been prepared by Sri K. S. Rajhans, I.F.S. Working Plan Officer, Southern Circle.

(6) Protection Working Circle

This working circle comprises all the forests on the steep hikk slopes, where exploitation is neither possible nor advisable from the forest conservation point of view. Such areas should be clearly delineated and marked out on the ground as well as on the map. No felling should be allowed. The area allotted to this working circle is 31221.27 acres/ 12488.50 hectares.

The following table shows the area allotted to the different working circles and total forest areas in the different ranges :- (Appendix – III)

Name of Range	Total forest area in acre/hect	Area under different W.C.					
		Coppice W.C. in Ac/Hec.	Coppice selection in Ac/Hec.	Reh. & Soil conservation W.C. in Ac/ Hec.	Plantatio n W.C. in Ac/ Hec.	Wildlife W.C. in Ac/Hec	Protectio n W.C. in Ac/Hec.
1	2	3	4	5	6	7	8
Mango	<u>51261.01</u>	<u>10643.64</u>	-	<u>12929.18</u>	<u>11586.61</u>	<u>7217.87</u>	<u>8883.71</u>
	20504.40	4257.45	-	5171.67	4634.64	2887.14	3553.48
Ghatsila	<u>23805.93</u>	<u>16181.16</u>	-	<u>2458.86</u>	<u>3862.60</u>	-	<u>1303.31</u>
	9522.37	6472.46	-	983.54	1545.04	-	521.32
Musabani	<u>72169.45</u>	<u>40962.07</u>	<u>13333.23</u>	<u>2312.93</u>	<u>2703.03</u>	-	<u>12858.19</u>
	28867.78	16384.82	5333.29	925.17	1081.21	-	5143.27
Rakhamines	<u>48306.81</u>	<u>12552.20</u>	<u>7169.20</u>	<u>16844.56</u>	<u>3564.90</u>	-	<u>8176.05</u>
	19322.72	2020.84	2867.68	6737.82	1425.96	-	3270.42
Chakulia	<u>41522.12</u>	<u>16601.69</u>	-	<u>10028.91</u>	<u>12891.54</u>	-	<u>NIL</u>
	16608.84	7440.63	-	4011.59	5156.61	-	NIL

Block and Compartments

Each village has been taken as an unit. The demarcated forest in each village is shown on 16"-1 mile cadastral maps. The forests have also been shown on 1:25,000 scale topographical maps.

Period of the plan and necessity for intermediate revision:-

This working plan has been prepared a period of 10 years i.e. 1985-86 to 1994-95. A review of the results of the treatments prescribed in the plan would however be made in 5 years and necessary modification would be incorporated in the plan if so required after the review. The plantation working circle will have to be brought up-to-date during the review after 5 years as by that time many more plantations will have come to the stage of harvest.

Part – II

Coppice with standards working circle

General constitution of working circle

This working circle comprises the bulk of the forests of classification A, B and part of C as dealt in para 41 (I) & (1III) and 42 of chapter II of Part I. These forests have been placed under this working circle irrespective of the fact whether they are accessible or comparative in accessible and whether they are on the hills or on the plains. In fact comparatively in accessible forests can be opened up by having feeder roads. The forests in this working circle are generally composed of Sal and miscellaneous species. Sal occurs mostly in plains and the lower slopes of hills with varying proportion of usual associates. Except in unworked forests situated in inaccessible tract. Sal crop occurs generally in different pole stages. Natural regeneration of Sal is adequate in valleys in remote forests. As per all India coppice quality table, sal crop is generally of quality B, except in valleys where it reaches quality A. the forests consisting pure miscellaneous species generally occur on southern aspect and higher slopes of hills. Natural regeneration of certain species such as bija is fairly conspicuous in some of the forest; others on coppicing have formed well stocked crop.

This working circle covers an area of 98940.56 acres/ 39576.22 hectare. Range wise break-up of area has already been listed in Paragraph 83 of chapter I in part II.

SPECIAL OBJECTS OF MANAGEMENT

The special objects of management are :-

- (i) To meet the bonafide agricultural and domestic requirements of the right holders without deterioration of the forests.
- (ii) To meet the supply of non-right-holders and the market and the export trade out of the surplus.

- (iii) To improve the stocking and quality of the forest by regulating the cutting, grazing, planting and by suitable cultural treatment.
- (iv) To ensure continued forest cover to prevent soil erosion, flood and regulate water supply.
- (v) To organize management of these forest in such manner that local people living near them may find sufficient employment in forestry operations.
- (vi) To foster among the local inhabitants a sense of the value of forest and to win their active and willing co-operation in forest conservation.

STOCK MAPS

The forests have been stock mapped on 4"=1 mile topographical sheets show principal species, their average size density, extent of rooted wastes, area fit for plantation, area already planted etc. Plantation already done have also been stock mapped showing their density and species. The details are given in appendix – I.

METHOD OF TREATMENT

(a) The silvicultural system adopted is coppice with standards. Since the demand mainly relates to poles, fire wood pit props, tram line & sleepers. The forests, in the present state of biotic and edaphic factors, are not capable of growing large size sound trees too. Standards will however be retained to serve the following object:-

- (i) To ensure re-stocking of blanks and understocked area,
- (ii) To increase the proportion of more valuable species,
- (iii) To promote production of large sizetimber.

(b) Rotation

The study of defects developing in the trees of different girth classes in three categories of forest (para 41(I) & (II) and 42) in which the forests

of Dhalbhum Forest Division have been divided for the purpose of this plan strongly indicates the size of healthy trees which can be grown in the forests of category A, B and C. They are given in the table below –

Category of forests	Size of health trees (Diameter in inches/Cm)
A	12/30
B	8/20
C	4/10

The forests dealt with under this plan are mostly of quality B. The all India yield table for quality B shown that :-

- (1) An average of 11.7” diameter is reached in about 60 years;
- (2) An average of 7.4” diameter is reached in about 40 years, and
- (3) An average of 5.3” diameter is reached in about 30 years.

Poles of the above descriptions have got keen market and would at the same time meet the Bona-fide demands of right holders.

The impact of adepic and biotic factors as discussed below, also indicate the possibility of growing trees only upto the size as indicated above.

In the forests of category A, good soil in varying depth exists, adverse effect of grazing in not much reflected, human interference is comparatively much less and demand for the produce is moderate.

In the forests of category B, soil has considerably deteriorated on account of fire, grazing, human interference and demand for the forest produce is high, where as in the forests of category C, the deterioration of soil on account of fire, grazing and indiscriminate fellings has gone for enough to cause erosion of soil, formation of gully and absence of organic matter.

The forests are generally right burdened and the demand is more than the forests can sustain.

In consideration, therefore, of the edaphic factors, which would permit to grow maximum size of healthy and defect free poles while satisfying at the same time the demand of local people, the following rotation is prescribed for the forest of category A, B and C.

Category of Forests	Rotation in Years
A	60
B	40
C	30

CONSTITUTION OF FELLING SERIES

In constituting the felling series, the points taken in to consideration are :-

- (i) All forests burdened with rights have been grouped together irrespective of their legal classifications.
- (ii) Compact block of forests, depending on their situation have been grouped together.
- (iii) Right burdened felling series lie within a radius of 8 Km of the villages of right holders.
- (iv) For the sake of continuity, the felling series of previous plan has been maintained as far as possible.
- (v) For the sake of economy, the felling series are so constituted as to permit on annual coupe of more acres as far as possible.

CLASSIFICATION OF FELLING SERIES

In consideration of the measures required, subsequent upon main felling, to improve the forests in quality and also in stocking, the felling series

have been further classified in to group A and Group B. The distinctive feature of these two groups are discussed below.

FELLING SERIES UNDER GROUP A

Under this group, has been allotted felling series where soil is satisfactory, stocking of crop normal, impact of grazing, fire and human interference not too intense and where natural regeneration is fighting the battle of "Survival of the fittest" such felling series generally lie in comparatively in accessible localities.

FELLING SERIES UNDER GROUP B

This group embraces felling series where crop is open, soil is deteriorating fast and forest is turning in to blanks on account of grazing, fire and indiscriminate felling. Such felling series fall within thickly populated zone of heavy demand and lie in easily accessible localities.

The following felling series under coppice with standard system have accordingly been constituted:-

Statement of Felling Series under coppice with standards Working Circle

Name of the Range	Sl. No.	Name of the F.S.	Classification	Total effective area in Ac/Hec.	Rotation	Annual coupe area in Ac/hec.	Weather Right burdend or free of Right
1	2	3	4	5	6	7	8
Rakhamines Range	1.	Kapargadi	B	1853.14/741.26	40	46.30/18.52	Without Right
	2.	Somaidih	A	2107.40/842.96	40	52.68/21.07	Without Right
	3.	Panulia	A	4206.96/1682.78	40	105.17/42.07	Without Right
	4.	Rakhamines	B	3528.95/1411.58	40	88.22/35.29	Without Right
	5.	Ranikudar	B	1016.45/406.58	40	25.41/10.16	Without Right
Ghatsila Range	6.	Burudih	A	3738.82/1495.53	40	93.47/37.39	Without Right
	7.	Tikri	B	586.21/234.48	30	19.53/7.81	With right
	8.	Rangabandh	B	976.73/310.69	30	25.89/10.36	With right
	9.	Phuljhore	A	2267.85/907.14	60	37.79/15.12	Without right
	10.	Basadera	A	2457.54/983.02	40	61.54/24.58	Without Right
	11.	Hullung	A	2866.50/1146.60	60	47.77/19.11	Without Right
	12.	Sham Nagi	B	1310.10/524.04	30	37.66/15.06	Without Right
	13.	Kesharpur	A	2390.41/956.16	40	59.76/23.90	Without Right
Mango Range	14.	Bonta	A	818.80/327.52	40	20.47/8.13	Without Right
	15.	Dangdung	A	864.45/345.78	40	21.61/8.64	Without Right
	16.	Nutandih	A	2001.17/800.47	30	56.13/22.45	Without Right
	17.	Jamdih	A	2061.00/824.40	40	51.52/20.61	Without Right
	18.	Jhunjhaka	A	560.00/224.00	40	14.00/5.60	Without Right
	19.	Gobarghusi	A	1643.29/657.32	30	47.33/14.93	Without Right
	20.	Dalapani	A	2694.93/1077.97	40	69.43/27.77	Without Right
Musabani Range	21.	Kakdoha	B	1227.67/491.07	30	40.92/16.37	With right
	22.	Dholabera	B	1576.01/510.40	30	52.53/21.01	With right
	23.	Arjunbera	B	628.21/251.28	30	20.94/8.38	With right
	24.	Murathakura	A	4822.80/251.28	60	80.38/32.15	Without right
	25.	Kundaluka	A	4822.80/1929.12	40	38.60/15.44	Without right

1	2	3	4	5	6	7	8
Musabani Range	26.	Karida West	A	3187.61/1275.04	60	53.12/21.25	Without right
	27.	Singhpura	B	1327.88/531.15	30	44.26/17.70	Without Right
	28.	Dumaria	A	3209.50/1283.80	40	80.24/32.10	Without Right
	29.	Bhalki	A	1905.00/762.00	40	47.60/19.04	Without Right
	30.	Pitamuhali	A	1051.59/1695.82	30	35.05/14.02	Without Right
	31.	Khairbani	A	4089.56/1695.82	60	68.16/27.26	Without Right
	32.	Bomro	A	2240.03/896.01	40	56.07/22.43	With right
	33.	Bhitaramda	A	1921.03/768.41	40	48.02/19.21	With right
	34.	Kalimati	B	623.30/249.32	30	20.77/8.31	With right
	35.	Makri	B	1181.44/472.58	30	39.38/15.75	With right
	36.	Bakrakocha	A	4648.28/1859.31	40	116.20/46.48	Without Right
	37.	Dimarbhandhi	B	1086.26/434.50	30	36.21/14.48	With right
	38.	Paharpur	A	813.82/325.53	30	27.13/10.85	Without Right
	39.	Dumudih	B	1117.46/446.98	30	30.58/12.23	With right
40.	Kantasala	B	1734.17/693.67	40	43.35/17.34	With right	
41.	Asanbani	A	1099.80/439.92	30	36.66/14.66	With right	
Chakulia Range	42.	Maisadhara	B	688.37/275.35	30	22.94/9.18	With right
	43.	Jamira	B	1285.13/514.05	30	37.45/14.90	With right
	44.	Chakulia	A	1977.78/791.11	30	65.92/26.37	With right
	45.	Jorisa	B	481.62/192.65	30	12.25/4.90	With right
	46.	Kalajharia	B	919.85/367.94	30	21.48/8.59	With right
	47.	Jamua	A	475.88/190.35	30	15.86/6.34	With right
	48.	Sunsunia	A	882.40/352.96	30	29.41/11.76	With right
	49.	Kesharda	A	873.85/349.54	30	29.13/11.65	With right
	50.	Nayagram	A	2639.55/1055.82	40	66.82/26.73	With right
	51.	Dumariya	A	674.57/269.83	30	22.48/8.99	With right
	52.	Gobrabani	A	522.26/208.90	30	13.17/5.27	With right
	53.	Choirara	B	286.27/114.51	30	9.54/3.82	With right
	54.	Narsingharh	A	2647.08/253.58	30	88.33/35.33	With right
	55.	Amda	B	633.95/253.58	30	11.23/4.49	With right

56.	Basajhore	B	3613.03/1445.21	40	90.32/36.13	With right
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Appendix – II gives the details of forests which go to constitute different felling series.

DIVISION INTO COUPES

Net area of felling series has been arrived at after deducting the unproductive areas of the forests which go to constitute the felling series. The unproductive areas include blanks, plantations and rooted wastes. The unproductive area has been shown both in stock maps and management maps wherever the size of the unproductive area is either small or linear. The size of the unproductive area is either small or linear in character, it has not been possible to show on account of the smallness of the scale of the maps. Only the net area of the felling series has been divided into coupes to ensure the availability of forest produce throughout the period of rotation.

Large size unproductive areas would be treated by the afforestation division which is already functioning whereas the smaller unproductive areas will be dealt with by territorial division.

DEMARICATION OF COUPE

Coupes must be demarcated on the management maps. Fifteen coupes have been shown on these maps.

Coupes will be demarcated on the ground by cutting clear lines 5" wide all around. Trees along the coupe lines or immediately on the side of the coupe will be double ringed with coaltar at breast height. Such trees may be of diameter 6" and above standing 100'-150' apart. Each coupe in right free felling series shall be divided into two sections by cutting internal line to ensure efficient control over fellings, whereas right burdened coupes shall be divided into four sections in the like manner. The internal lines need not be very wide but must be clearly distinguishable. The coupe lines must be clearly marked and double coaltar ring must show up properly, suitable signboards indicating the number of coupes,

area year of felling etc. shall be put up at coupe corners and at the crossings of important roads and foot-paths they may be utilized for writing therein, the necessary information by which boards may be dispensed with.

Right burdened coupes will be demarcated as in preceding paragraph except that such coupes will be divided into four equal parts by means of distinguishable internal lines.

PRIORITY ALLOTMENT OF COUPES AND REQUIREMENT OF FUNDS

Coupes will be laid out a year in advance of actual fellings. Immediately after the demarcation of coupes, items of work required for the improvement of future crop will be listed. This will include all or a few of the measures recommended under sub-head "Subsidiary Operations" depending on the crop. Regular estimate for the execution of such of the measures as found necessary for the improvement of future crop shall be made. The preparation of estimate at this stage will enable the Divisional Forest Officer to include the funds required in his budget.

Priority list of the coupes needing measures of improvement would also be prepared. In the event of entire required funds being not available, work of improvement would be done in coupes ranking high in the priority list.

There is some coupe of adjustment too as all the coupes of felling series under group B may not require all the measures to the same extent.

Funds for measures recommended under head "Subsidiary operations" may be available from one or more of the plan schemes. The Divisional Forest Officer has the refer to press for funds under any of the plan schemes in case it is not forthcoming under any one plan scheme.

Inspite of all these, if the bare requirement of funds is not available for the coupes in priority I, it is advisable to stop felling in such of the coupes as coppice regeneration is almost sure to fail and the process of creation of blanks

will get accelerated. A list of such coupes may be sent to the conservator of Forests before handing over to state trading wing.

STANDARD MARKING AND RULES THERE OF :-

Standards will have to be selected with utmost care as unless they are well grown, healthy, suitably placed and of valuable species depending, upon the availability of trees. Their spacing will depend upon various factors. The main influencing factors will be dealt with in subsequent paragraph.

In felling series to be worked under 60 years rotation, the objects (i) (ii) indicated in paragraph 89 are intended to be achieved, where as in felling series to be managed under 40 years and 30 years rotation the objects (ii) (iii) indicated in paragraph 89 are of comparatively greater importance. It is also doubtful that the standards in felling series to be worked under 60 years and 40 years rotation would last till the second rotation to produce sound timber. In consideration of these, the number of standards to be retained per acre and the sized to be preferred corresponding to different rotations are given below :-

Table - XII

Rotation	No. of standards to be retained per acre	The size to be preferred (in diameter)
60	8 to 12	8" – 10" (20 cm – 25 cm)
40	12 to 16	6" – 8" (15" cm – 20 cm)
30	16 to 20	4" – 6" (10 cm – 15 cm)

The size given above are for sal, bija and asan. The sizes for standards of other species when it becomes necessary to retain them in the absence of the said three species are left to the discretion of the marking officers.

MARKING RULES

- (i) Standards shall be marked with coaltar at breast height and the base as close to the ground as possible.

- (ii) The standards shall be serially numbered and listed in the prescribed form.
- (iii) No of coupes shall be recorded below the No. of the standards.
- (iv) The standards shall preferably be of species having superior economic value.
- (v) In selection of standards, bija, gamhar, Karam, siris of 4" to 12" diameter will have equal preference with Sal provided they are healthy and promising.
- (vi) Standards will be evenly spaced as far as possible.
- (vii) Climbers resting on, or climbing upon the trees marked as standards must be cut at the time of marking.
- (viii) Straight, healthy and sound poles will only go to form as standards.

METHODS OF EXECUTING FELLINGS

(I) Out of the four sections of right-bardened coupes one section of the coupe shall be opened to right-holders. If the right holders after proper cutting and utilization exhaust all the produce of the allotted section, and bonafide requirements still remains unsatisfied, the next adjoining section shall further be opened to them. In following year the first section of the their current coupe shall similarly be opened to the right holders and surplus of previous year if any, shall be worked by state trading division for meeting the requirements of non-right holders in the locality, or for feeding the markets. This is prescribed in consideration of improper utilization of forest produce particularly by right holders. In right-free felling series the entire current coupes shall be handed over to state trading division to meet the general demand on payment.

(II) Cutting in any section must be done from one end to other end.

(III) In addition to the standards marked for retention all fruit bearing trees such as kend, Mahua, Piar, Mango, Amla, Harra, Bahera, Kusum and Bija shall be retained provided that the total number of retained trees inclusive of

standards shall not exceed 20 per acre in felling series being working under 60 years and 40 years rotation and 25 per acre in felling series with 30 years rotation.

(IV) Unless they are malformed, or diseased, semal, bhurkund, chhatni, Khair and Bamboos shall also not to be cut.

(V) The remaining trees and high stumps shall be cut down at a height not exceeding six inches from the ground level.

(VI) Trees of sacred graves, Sarna, or Jahira shall not be cut.

(VII) In consideration of strong silvicultural reasons, aesthetic value and wild life preservations, felling may not be done over such portions of the coupe wherever it is so required.

DISPOSAL OF COUPES

The method of disposing of coupes was by auction prior to 1980-81. After this period the coupes are laid out by territorial divisions & handed over to the state trading division for exploitation, extraction and sale of the forests produce.

YIELD

The regulation of yield is fixed by area.

SUBSIDIARY REGULATIONS

The attainment of the objective enumerated in paragraph 89 in chapter I of part II is carried out as below.

REGULATIONS FOR FELLING SERIES UNDER GROUP A

In the year immediately after the main felling the following operations are required.

- (i) Dressing down any stumps higher than 6" from ground level.
- (ii) Freeing shoots of sal and other superior species from the overtop of grassed or inferior species.
- (iii) Coppicing down top broken or otherwise damaged stands and the trees meant to be felled.
- (iv) Cutting of the climbers.

Close attention has to be given to seedlings of Sal which exist in different stages in most of the felling series of this group and to the blanks or otherwise unproductive patches for which the following measures are prescribed:-

- (a) Seedling occurring in patches shall be freed from weeds overtopping, inferior species, climbers and felled materials etc.
- (b) Woody malformed seedlings either in group or singly shall be cut back.
- (c) Soil over the blanks or unproductive patches shall be just hoed or loosened 6"-9" in depth along the contours at 12' intervals.
- (d) With first pre-monsoon shower, sal seeds shall be sown in line over the worked over soil and lightly covered.
- (e) Such patches shall be inspected during the rains to assess the extent of germination and the operation, if any required, for survival and growth of the seedlings.
- (f) Rigid fire protection at least for 5 years shall be ensured. The danger of fire may be considerably minimized if coupe lines are kept cleared by early burning.

The operations as under item a,b,d, would be productive of better results if funds and staff permit to execute them in the preceding year.

REGULATIONS FOR FELLING UNDER GROUP B

All the operations enumerated under item (i) to (ii) in paragraph 112 will be carried out in the coupes of felling series under group B in the year immediately after the main felling. Over and above these, the items of work considered highly important for attaining the objective are :-

- (a) Provision of effective fencing for 5 to 7 years against grazing depending on the growth of forests crop. In case fencing happens to be barbed wire, it may be used again.
- (b) Planting up of blanks with suitable species preferably Eucalyptus & chakundi as it has been found growing well on refractory soil and is not palatable to cattle. Planting of Eucalyptus species may be tried even without fencing if the funds are not forthcoming for fencing. Planting will be done in a regular manner by following the standard technique practiced in the state.
- (c) All other operations such as hoeing in the 2nd and 3rd year of planting, fire protections etc. shall be carried out in accordance with the recommendation of Reviewing committee on afforestation and their modifications from time to time.

CLEANING

This operation will cover all the felling series and mainly consist of :-

- (i) Reduction of coppice shoots to 2 or 3 depending on growth rate of coppice shoots, soil conditions and incidence of erosion. In Poor and over eroded soil the number of coppice shoots shall be 3 if available.
- (ii) Cutting away all climbers including these interfering with seedlings of sal from natural regeneration.

- (iii) Freeing coppice shoots and seedlings of sal and other valuable species from inferior species, shrubs and grass. This operation will be carried out in the 3rd year of main felling.

Normally it will extend over the entire coupe but in case of inadequate funds, items (i) to (ii) as prescribed above may be restricted to sal patches only, but for helping the natural sal seedlings entire area will be done over.

In view of the general application of the above prescription no schedule of cleaning is considered necessary.

THINNING

During the first thinning the operation will consist in :-

- (i) Reduction of coppice shoots to one per stumps in coupes felling in category A and two per stump in coupes of category B.
- (ii) Freeing valuable species from the dominance of Tree of inferior species.
- (iii) In congested groups, removal of the stag-headed, unhealthy, suppressed poles only to the extent that will provide sufficient growing space for the remainder.
- (iv) Removal of such of the standards as may have developed defects and disease.

During the second thinning, the operation will consist in :-

- (i) Removal of unhealthy, suppressed poles to the extent that will provide sufficient growing space for the remainder. In case, sufficient space is not provided in this way, healthy, dominated or co-dominant tree would also be removed. Item (ii) to (iv) as prescribed for the first thinning, would also be gone over.

The following will be the general programme of thinning :-

Rotation	Area of coppicing crop.		
	1 st thinning	2 nd thinning	3 rd thinning
60 Year	15 th Year	30 th year	45 th year
40 Year	15 th year	30 th year	-
30 Year	15 th year	-	-

The above programme is suggested on presumption that biotic and edaphic factors will affect the crop adversely, this presumption, it is no doubt, will prove wrong to a varying degree. The decision to execute this operation a year in advance of the time schedule will therefore, necessitate and throughout study of the crop by staff not lower in rank than forest ranger.

Thinning may not, therefore, be required in all coupes and all over the area of any particular coupe. It would ordinarily be confined to valley type where the crop may really be in need of such operations. On dry eroded areas as also on murrum soil great caution will be necessary so that the ground may not get unduly exposed and remain so for long as the result of thinning.

In view of the time schedule laid down in para 118 the following tabular statement indicates the coupes due for thinning during the next 10 years. The felling series worked on a rotation less than 30 years during the previous plan will not be thinned for the next 10 years.

Years of thinning	Coupes felled in coupes felled in	
	F.S. worked on 60 years rotation	F.S. worked on 40 years rotation
1985-86	1970-71	1971-72
1986-87	1971-72	1972-73
1987-88	1972-73	1973-74
1988-89	1973-74	1974-75
1989-90	1974-75	1975-76
1990-91	1975-76	1976-77
1991-92	1976-77	1977-78
1992-93	1977-78	1978-79
1993-94	1978-79	1979-80
1994-95	1979-80	1981-82

OTHER REGULATIONS

(A) RIGHT

Only the right holders of the villages which constitute felling series shall be entitled for exercise of their rights in that felling series. For the exercise of rights, one of the four sections will be thrown open at a time to ensure proper utilizations of the forest produce. If the bonafide requirements are not satisfied with the produce of the first section, the second section will be opened for the appropriation of forest produce by the right holders. Execution of fellings and felling rules as prescribed in para 109 will rigidly followed by the right holders.

(B) GRAZING

Coppice coupes will remain closed to grazing for a period of six years from and including the year of felling. This restriction may, however, be relaxed earlier in the case of any coupe where the Divisional Forest Officer finds on his inspection that grazing if allowed, will not adversely affect the growth of the new crop. On other hand if he finds that grazing over such area cause damage to the soil and the crop, he may prohibit grazing over such area for a specified period subject to the limit of the total area of the felling series at a time.

(C) FIRE

Efforts will be made to protect the entire working circle against fire. In case, death of funds does not permit, at least the areas felled during the last five years must be protected against fire.

(D) UNAUTHORISED CUTTING

People are in the habit of cutting young crop mainly for ghoran and to some extent for firewood. The requirement of ghoran can be met to great extent from the produce obtained from cleaning operations & may be given free of cost to right holders provided they do the cleaning themselves under the direct supervision of Range staff. It may also be sold to non right holders.

COPPICE – SELECTION WORKING CIRCLE

General constitution and character of vegetation :-

This working circle comprises all the forests which are situated on high altitudes and on steep slopes where coppice regeneration is bound to fail. The predominating species is sal. Its important associates are assan, bija, Karam and Dhaura etc.

At most places the growth appears to be stunted. In some of the areas, however, the growth is healthy and good but the steepness of the slopes precludes any clear-felling system. In areas of stunted growth, the unhealthy appearance of the crop is due to frequent fire, high altitudes and poor soil.

The total area of this working circle, is 20502.43 acre/8200.97 hect. The details are given in appendix III.

OBJECT OF MANAGEMENT

The objects of management are as under:-

- (i) To preserve the forests, to protect the hills slopes from denudation;
- (ii) To utilize the trees of exploitable size where this can be without any risk;
- (iii) To free advance growth wherever present by removal of the over wood;
- (iv) To improve the quality of the crop;
- (v) Consistent with the above, to get what ever returns are possible.

SILVICULTURE SYSTEM

The system prescribed is coppice-selection system. Exploitable trees which are silviculturally available will be removed at the same time, adequate soil cover will be maintained.

SILVICULTURALLY AVAILABILITY

The expression "Silviculturally available" is defined as follows :-

A green and healthy tree is silviculturally available when it fulfills all the three following conditions :-

- (a) It forms part of a congested crop and the principle of improvement felling warrants its removal.
- (b) Saplings or poles or established regeneration of the same or of equally valuable species exist to take its place, and
- (c) Its removal does not create permanent gap in the upper canopy. Any opening of the tree as centre is regarded as constituting a gap if adequate number of young saplings or poles or younger established regeneration do not exist.

FELLING CYCLE

This is prescribed at 20 years.

ANNUAL COUPES

The pattern of forming annual coupes will be same as adopted in coppice with standard system. The change would be that in each annual coupe only the exploitable trees (50%) shall be marked.

Exploitable diameter :- 24" girth or 8" dbh (o.B.) shall be the exploitable girth or diameter for all species.

The above exploitable girth or diameter have been based on information obtained, after carrying out a partial enumeration. The intensity of enumeration was over an area of one hectare in different felling series.

The sample of enumeration done in field is given as below:-

Name of Range	Sl. No.	Name of F.S.	Number of trees in different girth				
			6"-12"	13"-18"	19"-24"	25"-30"	Above
1	2	3	4	5	6	7	8
Rakhamines	1	Orkabera	107	67	35	15	17
	2	Chandanpur	11	134	20	20	4
Musabani	3	Karida East	16	88	43	16	16
	4	Asthakauwali	23	11	37	16	60
	5	Dongadaha	34	39	36	14	41
	6	Lakhaidih	30	56	40	20	35

AREA STATEMENT

Name of Ranges	Name of F.S.	Total Area of F.s. in Ac.	Rotation	Annual coupe Ac.
Rakhamines	Orkabera	3932.80	40 yrs	98.32
	Chandanpur	3236.40	40 yrs	80.91
Musabani	Lakhaidih	2802.60	60 yrs	46.71
	Dongadaha	2276.93	40 yrs	56.92
	Asthakauwali	3004.72	60 yrs	50.07
	Karida East	5248.98	60 yrs	87.48

The table below gives the areas allotted to this working circle. The areas are in two ranges viz Rakhamines & Musabani.

YIELD

The yield will be regulated by area. In each annual coupe 50% of the exploitable trees will be marked only when the tree is silviculturally available.

The percentage removal has been fixed at 50% as it is not possible to calculate accurately the percentage by Smithies' Safe-guarding Formula. This is because of the widely different nature of the crop. Since it is the first time to introduce selection felling in most of the areas. So it is considered adequate if 50% of the crop is retained.

METHOD OF EXECUTING THE FELLING

MARKING RULES

The following marking rules are prescribed;

- (i) All dry, dead or heavily diseased trees with negative increment will be marked.
- (ii) Among healthy green trees, 50% of the sal and miscellaneous trees that have attained exploitable diameter will be marked.
- (iii) No tree will be marked where,
 - a. The crop density is low or
 - b. The regeneration is absent
 - c. Where the slope exceeds 60 degree.
- (iv) A well-grown stem would be preferred to a badly grown stem even if the former is of an inferior species and the latter of a more valuable species.
- (v) Other species of the respective exploitable diameter will be marked on the principle of improvement fellings.
- (vi) On the edges of blanks or partial blanks, tree will be retained.
- (vii) All climbers shall be cut at the time of marking.

EXECUTION OF FELLING

- (i) All trees marked must be felling.
- (ii) Stump height should not exceed 6" from the lower slope.
- (iii) Shape cut with sharps is to be ensured.
- (iv) All trees felled in addition to lops and tops should be taken out of the forest.
- (v) N the right burdened forest the annual coupes are first to meet the demands of right holders and there after the surplus can be sold.

(vi) In any coupe, no debris should be left.

SUBSIDIARY SILVICULTURAL OPERATIONS

In the year following the main fellings the following silvicultural operations shall be carried out :-

- (1) Cutting back of damaged stems of valuable species.
- (2) Girdling or felling of only those of the marked trees, the removal of which is silviculturally desirable.
- (3) Cutting back of badly grown saplings and poles of sal, Bija, Gamhar or Panjan.
- (4) Climber cutting.
- (5) In open areas or blanks or in areas where climber infestation is heavy and nothing of important exist, plantation of either Eucalyptus hybrid or Acacia auriculaformis, depending on the soil may be raised.

PROTECTION FROM FIRE

The entire felling series shall be protected from fire. Without the same the inhibited regeneration will not have chance to come up.

Fire protection will further help the natural regeneration on path to progress.

GRAZING

The annual coupes should be closed to grazing for a period of five year.

In other areas where soil erosion is in progress or regeneration is being damaged by grazing, the Divisional Forest Officer should stop grazing over area for a period to be decided by him.

PART – II

CHAPTER - III

REHABILITATION AND SOIL CONSERVATION WORKING CIRCLE GENERAL CONSTITUTION OF THE WORKING CIRCLE

This working circle comprises such villages containing forest which have been maltreated in past and have been reduced to scrub, designated as “rooted waste”. This includes the rooted wastes of Sal and Miscellaneous species and also included the areas in need of special treatment as a result of denudation, soil erosion etc.

To enable these forests, to Performa their proper role in soil and water conservation their rehabilitation is of utmost importance.

SPECIAL OBJECTS OF MANAGEMENT

- (i) To protect the rooted waste of Sal and miscellaneous against unregulated cutting grazing and fire and to improve them by cutting back and tending operations there after,
- (ii) To rehabilitate the rooted waste forests by sowing and planting of suitable species in gaps and in degraded lands,
- (iii) To carry out anti-erosion measures and improve the soil and moisture conservation capacities of these lands.

CHARACTER OF VEGETATION

The forest included in this working circle have been classified into two categories :-

- (i) Sal rooted wastes
- (ii) Miscellaneous rooted wastes.

SAL ROOTED WASTES

Pockets of Sal forests situated in the midst of density of density populated areas have had to bear the on slaughter of the people of these areas. Most of these forests have been cut repeatedly with a very high incidence of high stumps and pollards. Heavy grazing and repeated fire in these areas have also added to the woes of such forests.

These sal forests can recover with remarkable quickness if afforded adequate protection against these evils. In doing so, however, it has to be borne in mind that the problem which caused the present condition of these forests is still there. Any treatment prescribed has to be so oriented as to meet the local demands while rehabilitating the forests. Such areas are scattered in about whole Dhalbhum Forest Division.

2. Miscellaneous rooted wastes

The miscellaneous forests occurring in localities as in (i) above have met with a similar fate and have been reduced to the status of rooted wastes.

Area Statement

The total area of working circle is 44574.52 acres/17829.80 hectare distributed over all the ranges. The details are given in Appendix V.

Method of treatment

The urgent need of the areas allotted to this working circle is protection i.e. protection from ruthless cutting, uncontrolled grazing and fires. After this protection is afforded, steps will have to be taken to rehabilitate the areas so the first treatment to be given to the areas of all two categories will be the same viz, to fence them.

It is difficult to lay down an annual target of area to be tackled. The total area being 44574.52 acre if it is proposed to tackle the total areas in 20

years, an area of 2228.75 acre will have to be attended to annually. This will depend on funds for coming. The annual target will, therefore depend entirely on the availability of funds. As delay in tackling the areas is likely to result in their deterioration so it is suggested that attempts may be to attend to these areas as quickly as possible.

The treatment to the rooted wastes of both types will be same and is described below :-

After fencing, the crop should be cut back. The felled material obtained as a result of cut back any be given to the right holders free of cost. In the following year, cleaning should be carried out. Rigid fire protection has to be ensured. After fencing and cutting back the blanks should be planted up by the suitable species such as Eucalyptus, Accacia, and Chakundi etc.

In areas affected by erosion, anti-erosion measures will be taken. These will consist of construction of check dams and gully plugging. Diversion channels will be provided and the heads of the gully will be eased off on the slopes Babai tuft and vitex negundo cutting will be planted.

PART – II
CHAPTER – IV

General Constitution

This working circle cover –

- (A) All the plantations raised in the past.
- (B) Areas fit for raising plantations.

Special Objects of Management

In view of the constitution of the working circle a single set of special objects of management shall not be applicable to the whole of the working circle. The special objects of management are therefore, set forth separately for the planted and plantable areas.

- (A) Special objects of management for the existing plantations :-
 - (i) To improve the quality of plantations by scientific management.
 - (ii) To improve the stocking in plantations by adopting suitable scientific measures including cultural operations.
 - (iii) To meet the increasing demand of raw material for wood based industries and others.
 - (iv) To ensurb soil moisture conservation.
 - (v) Consistent with above to increase the revenue on a sustained basis.

- (B) Special objects of management for plantable areas
 - (i) To bring under vegetation area chither to blank or partially stocked.
 - (ii) To minimize the loss of soil and run-off from such areas.
 - (iii) Consistent with soil and climatic condition to raise plantation of species which may be used as raw material by wood based industries.

- (iv) To increase the potential of forest produce and revenue earning by using quick growing species.
- (v) To provide employment to local people.
- (vi) To meet the increasing demand of forest produce by industries and local people.
- (vii) To provide increased quantity of grass for fodder.

Description of plantations

In Dhalbhum Forest Division the plantation was started from 1952 between 1968 to 1984. The plantations have been raised in this Division over an area of 34,608.68 acres.

The details are given in the exploitation scheme prepared separately. The main species planted over extensive areas are Acacia, Eucalyptus, Chakundi and some where in patches are gamhar, Kaju, Karanj etc.

The Chakundi and Acacia auriculaformis wherever these species got established they are found growing well inspite of the fact that no cultural operation was carried out in these plantations. Wherever favourable conditions occur, natural regeneration of both of these species exist in plenty as in mango, Jurki plantations. The natural regeneration occurs both beneath the mother tree and in open patches.

Description of area

The impact of biotic factors on the forests close to habitation and big towns, has adversely affected the crop. Due to deterioration many forests have already turned into rooted wastes and some where is now complete blank. Blank occur on the fringe of forests particularly in forests on hills which give the linear shape to it. Failure to regenerate forests after felling, has also converted many coupes into blank, soil over these areas is invariably poor, erosion has set in and site. As a whole areas is completely impoverished, unless efforts are made to reforest. There is not even the remotest chance of getting back forest cover

naturally. At the same time no return is forth coming from these degraded forests. There is more probability of encroachment in such land.

Method of treatment

By and large the treatment would aim at felling up inter mitten blanks by planting with suitable species such as Acacia, Eucalyptus etc.

The details of the method of treatment would be same as adopted by Afforestation Division which reviewed from time to time by "Reviewing committce".

Agency

The planting of blanks are at present done by both Dhalbhum Forest Division and Singhbhum Afforestation Division. The Singhbhum Afforestation Division is exclusively entrusted with plantation where as the territorial division raised plantation along with its normal work of a territorial division. The Singhbhum Afforestation Division, can therefore take up large area for plantation compared to territorial division. A separate five year plantation scheme has already been prepared to allot areas for both division.

Both Singhbhum Afforestation division and Dhalbhum territorial division would raise plantation on the area allotted as per five year plantation scheme. In consideration of unforeseen factors the two Division Forest Officers may either change or modify the allotment of areas fit for plantation as and when felt necessary.

Plantation Series

The whole area of plantation working circle has been divided in two categories.

(1) Area already planted.

(2) Area fit for plantation.

Between 1975 to 1984 the areas which were already planed by territorial and Afforestation Division, have been grouped together and allotted to different felling series under plantation exploitation schemes keeping 10 years rotation.

Range wise break up of plantation felling series is given as below :-

Name of Range	Name of Plantation felling series	Area in Hect.
Mango	1. Mango	1963.06
	2. Patamda	1772.61
Ghatsila	1. Edelbera	642.83
	2. Dhalbhumgarh	903.37
	3. Tilamora	683.05
Musabani	1. Musabani	630.88
Rakhamines	1. Kudada	1287.30
Chakulia	1. Chakulia	1112.71
	2. Bahragora	1125.02
	3. Chandrapura	819.09
	4. Manusmuria	1067.91
		11980.83

Details of the plantation felling series are given in plantation exploitation scheme compiled separately.

The five year plantation scheme has already been prepared separately which includes area fit for plantation. The statement of areas fit for plantation are given in Appendix VI.

Rehabilitation of blanks within old plantation

As stated in paragraph 150 plantation has been raised over a total area of 30012.77 acre /12005.11 hectare till 1954. The most of plantations are however not uniformly successful on account of sporadic or patch failure. Failure, it appears, has been caused partly by adaphic and partly by biotic factors. Wrong choice of species and faulty execution of the technique are also the cause of failure in certain plantations. So such areas should be rehabilitated by suitable species taking into account the biotic and edaphic factors.

PART – II
CHAPTER – V
WILD LIFE WORKING CIRCLE

General Constitution of Working Circle

The forest of Dhalbhum Forest Division are very poor in wild life. Elephants are found in the forests of Dalma Hills and in hills of Rakhamines Range. In 1955 two tusker Elephants fought till their and where jadugora Uranium plant is in existence. Bear and Wild bears are occasionally seen all over except Chakulia Range. Bear and Sambhar are almost completely absent.

The Dalma hill along with its subsidiary range, has remarkably excellent forest cover, situated only at a distance of 16 km. from one of the biggest steel cities of India. Its rich flora and fauna have attracted the attention of naturalists and lover of wild life.

No where in this country nature has gifted the mankind with such a forest cover and scenic beauty so close to an iron steel factory and blast furnace. Elephants living in these forest undisturbed by the activities of this industrial belt, set an excellent example of mutual co-existence between man and animal. Keeping these views in mind, to preserve and protect the flora and fauna of Dalma Hills, in exercise of the powers conferred by sub section (i) of section 18 of the wild life (Protection) Act. 1972, it was notified as Dalma wild life sanctuary vide S.O. 1221 dated 17th July, 1976. Though the Dalma wild life sanctuary comprised the forests of Dhalbhum Division and Chaibasa North Division, but this circle per tains to the forests of only Dhalbhum Division.

Objects of Management

The main objects of Management are :-

- (i) To protect, preserve and develop wild life.
- (ii) To provide for a safe breedings place and nucleus for multiplication and dissemination of wild life.

- (iii) To improve the carrying capacity of the habitat and lastly,
- (iv) To develop tourism to increase revenues for the state.

Character of Vegetation

The forests of Dalma conform to champion's and seth's revised 5B/C1 and 5B/C2 type. The crop consists of dry deciduous mixed forests with moist miscellaneous patches occurring on the northern aspect and near nallas. Sal crop is found mostly in foot hills in some parts of Kadamjhore, Bandhdih and Bonta felling series. The miscellaneous crop consists of mainly Asan, Dhaura, Sidha, kend, Karam, Siriss, Bija, Bahera, Piar, Dokan, Kusum, Semal, Mahua etc.

The existing Forest of Dalma Wild Life sanctuary can be placed under three broad categories.

- (i) The forest of upper zone
- (ii) The forest of middle zone
- (iii) The forest of lower zone

Category I – The forests of upper zone, due to its favourable aspect and moist soil condition are better than the rest of the forests of Dalma hill. The movement of elephants is mostly confined in this area. Most of perennial water sources, Bandhas are situated in this locality. The dense forest and perennial water sources are favourable condition for concentration of elephants. The forests of Sal and miscellaneous species are found in this zone.

List of forests is given as below :-

Table – I

Sl. No.	Name of Range	Name of F.S.	Name of Forests	Area in Hect.
1	2	3	4	5
1.	Mango	Kadamjhore	Makulakocha Kadamjhore	568.05
		Kuiyani (part)	Kuiyani (Part)	138.60
		Dangdung (part)	Dangdung	103.40
		Chimti (part)	Chimti Andhaijhore	76.80
2.	Mango	Bonta	Bonta	613.37
				1500.22

Category 2 – The forest of middle zone are confined in the middle and lower slopes of the hills. They are poor in quality and need protection against illicit felling, grazing and fire. The main crop consists of miscellaneous species like Asan, Dhaura, Sidha, Bel, Gamhar, Siris, Doka, Semal, Piar etc.

The list of forest which fall in the second category, is given as below:-

Table – II

Sl. No.	Name of Range	Name of F.S.	Name of Forests	Area in Hect.
1	2	3	4	5
1.	Mango	Jhunghka	Muknadih (P) Jhunghata (P) Jorsej (P)	937.07
2.	Mango	Lailam	Lailam (P) Pagda (P)	606.09
3.	Mango	Sari	Sari	439.40
4.	Mango	Gobarghusi	Gobarghusi	668.45
5.	Mango	Beldih	Beldih (P)	369.87
6.	Mango	Chimti (P)	Chimti (P) Andherjhore (P)	392.15
7.	Mango	Dangdung (P)	Dangdung (P) Dhobini (P)	417.34
8.	Mango	Kuiyani (P)	Kuiyani	417.34
9.	Mango	Ramgarh	Ramgarh	468.12
10.	Mango	Kanderbera	Kanderbera	439.40
11.	Mango	Nutandih	Nutandih (P) Betaluka (P)	810.41
12.	Mango	Apo	Amdapahari (P) Apo (P) Sishda(P)	718.98
13.	Mango	Jamdih	Kukri Gobarbandha Jamdih	871.15
14.	Mango	Dalapani	Dalapani	1125.84
				13,749 hect.

Category 3 – This category of the forest contains very poor crop . The forests are in most depleted condition. All biotic factors have played their roles and are still doing so.

As a consequence of these the forests have much deteriorated. The crop consists of mostly miscellaneous species. List of forests shown in category III is given as below.

Table – III

Sl. No.	Name of Range	Name of F.S.	Name of Forests	Area in Hect.
1	2	3	4	5
1.	Mango	Bhelaipahari	Boko Kalajhore Chhotabanki Palasbani Deoghar Bhelai pahari Baliguma	1163.59
2.	Mango	Gerua	Gerua Barajpur Punda	500.89
3.	Mango	Kherua	Kandrukocha Kherua Dhursa	511.41
4.	Mango	Mirzadih	Kutimahuto Bhaduadih Saldoha Mirzadih	457.60
5.	Mango	Patipani	Halludbani Patipani	450.01
6.	Mango	Asanbani	Asanbani	813.05
7.	Mango	Saherbera	Chilga Chakulia	382.42
				4296.97 hect.

Method of treatment

The forests of category I is mostly dense and having many perennial water sources creating favourable conditions for elephants and other wild animals. There area several precipitous slopes which need attention and therefore, the forest cover growing over it has to be kept intact. The whole forests of this category should be treated as “Core area” and no felling should be allowed in the core area.

The forest of category II and III due to excessive grazing, fire and illicit felling into scrubby and rooted waste with high and pollarded stumps. So it needs protection against all the biotic and edaphic factors. The high and pollarded stumps should be coppiced and fenced. Laying out of coupes should remain suspended at least for coming 10 years and such forests area should be rehabilitated by making five year scheme.

Right and concessions

The Right and concession of right holders will remain as such in the felling series out side the core are of Dalma Wild Life sanctuary.

PART – II
CHAPTER – VI
PROTECTION WORKING CIRCLE

General Constitution

The Working Circle comprises of the forests occurring on high hills and steeper slopes which may not be economically worked, and if worked, may add to the severity of erosion and run off. The forest allotted to this working circle lie in Rakhamines, Mango, Ghatsikla, Musabani Ranges.

Special objects of management

To maintain forest cover on the top of high hills and on steeper slopes for preventing excessive soil erosion and high run-off in the lower reaches of the hills.

To recreate vegetation on barren high hills and steeper slopes of hill.

Consistent with the above, to meet local requirement of forest produce.

Character of Vegetation

The areas allotted to this Working Circle, are generally rooted waste, grass land and barren. The crop is mainly of miscellaneous species such as Dhaura, Karam, Asan, Harsingar, Piar etc.

Species of dry locality particularly *Ntyctanthus* often –occur in young stages, The site conditions tend to be dry mainly on account of annual forest fires.

Distribution of Area

The total area allotted to Protection Working Circle is 311221.26 acre/ 12488.50 hectare.

The areas fall under this working circle are marked out on the maps and delimited on the ground. The range wise details of the areas are given in Appendix no. VII & VIII.

Method of treatment

The area which fall under this working circle, are clearly delineated and marked out on the ground as well as on the map. So no felling would be carried out in the forest allotted to this working circle. The area should be closed for at least 10 years to come up the vegetation. Removal of dead, dry and fallen wood by the villagers would only be permitted on departmental permit. Climbers causing damage the growing healthy tree would be cut away every five years.

Effects would be made to protect the areas against fire and grazing.

PART – II
CHAPTER – VII
MISCELLANEOUS REGULATION

Minor Forest Produce (Kendu Leaf)

Biri, common man's cigar is made out of Kendu leaf. It is basic raw material for the manufacture of Biri and found abundantly in dry open, denuded forests without any aid and care, Upland and fallow land are quite favourable sites of this species. If protected from hacking, it grows to a large size tree. However, the marketable kendu leaves are plucked from 3' to 4' high trees which give out big, thin & soft leaves. It is also not convenient to pluck leaf from big trees.

Kendu leaf of Dhalbhum tract in general and that of Kalikapur & Koyali in particular is highly favoured in the market because kendu leaves of those areas are very good in quality. Kendu leaf, over which not a penny is spent, fetches handsome revenue to government annually, though not on a sustained basis. The annual revenue varies with the market trend, method of sale, tenure of lease etc.

Between 1969-70 to 1980-81 the annual revenue realized from kendu leaf is given as below.

Year	Target of collection standard bage	Actual collection in standard bage	Revenue	Remarks
1969-70	-	59,592	3,17,956.00	
1970-71	-	51,663	3,58,651.00	
1971-72	-	31,746	3,91,036.00	
1972-73	-	-	-	
1973-74	44,444	25,821.831	18,17,106.67	
1974-75	33,570	28,222.199	9,41,787.88	
1975-76	32,750	25,023.995	5,52,682.92	
1976-77	32,750	29,093.393	11,96,495.35	
1977-78	33,500	26,997.747	11,34,265.80	
1978-79	33,500	19,950.938	9,64,759.39	
1979-80	35,650	15,541.695	3,27,721.28	
1980-81	35,650	19,759.755	5,13,039.73	

There is, however great possibility of increasing the revenue by re-orienting the method of sale and by improving the quality of Kendu leaf.

At present kendu leaf of forest and revenue land is placed for tender lastly auction for a single or three years. Generally offer for single year is low as intending purchasers have to spend more on organizing the plucking of leaf, maintenance of depots, transport etc. At the same time, the chances of poor collection of leaf in the event of unfavourable weather are given due weight by them.

Comparatively low offer for kendu leaf in Dhalbhum tract is on account of spurious traders who get raiyati land settled in nal payment but in fact get the kendu leaf either free or on nominal payment but in fact get the kendu leaf of forest and revenue land in their depots by paying somewhat more to the kendu leaf pluckers who pluck kendu leaf in their leisure and spare time and get payment on depositing the deposits. The bonafide purchasers often have either to negotiate such spurious traders or to give up certain areas for their collection. Over and above this, the purchasers have to pay royalty to the Government and to incur expenditure on other allied items. All these are taken in to consideration by the purchasers at the time they offer royalty.

Just by modifying the mode of sale and by making monopoly system of collection of kendu leaf, the Forest Department of Madhya Pradesh had been successful in raising their revenue many fold.

No operation whatsoever is taken to improve the quality of leaf. Revenue may increase to some extent if arrangement is made by the department to coppice the kendu plants in time where by leaf more in number and better in quality would be available for collection. This may either be done b the department itself or through the purchasers who might be given long lease. In the year of coppicing, yield may increase by 10 to 12 % with improved quality and if coppiced again in subsequent year, the yield may go up by 25% plants less than 1” in girth may yield improved quality of leaf for two years. The plants of Kendu

should be coppiced by the middle of February. Leaf becomes available after 40 to 45 days of coppicing. If it rains within a week of coppicing, improved quality of leaf is ensured and becomes available for collection earlier, whereas if it rains after the new leaves have just come out or remains cloudy for a day, the quality of leaf is adversely affected on account of eruption of Pox”.

In biri trade, quality of leaf generally goes by State Orissa leaf is taken as quality I, and that of Madhya Pradesh quality II; whereas the leaf of Bihar is graded as quality III.

In assessing the quality of leaf, size and thickness of leaf are taken into account. Quality I leaf is over 6” in size and yields 3 biris; there is less of wastage in the factory.

Depending on the weather, the yield of kendu leaf in Dhalbhum tract varies between 18000 bags to 50,000 bags. Each bag weighs about 60 Kg. the total collection of leaf broadly comprises of

Quality I	-	20 %
Quality II	-	30 %
Quality III	-	30 %
Quality IV	-	20 %

Quality IV leaf is generally rejected in the collection depot itself. The quality of leaf may, however be considerably improved by coppicing as discussed above.

Keenjhi Gum (*Sterculia urens*)

Trees of *Sterculia urens* yield keenjhi gum on tapping. *Sterculia urens* for tapping on commercial scale occurs in Mango Range particularly in Dalma Hill forests.

Tapping rules

The following tapping rules for trees of *sterculia urens* are prescribed.

- (1) *Sterculia urens* trees of 3 ft. in girth and over at breast height are only to be tapped.
- (2) Blazes should be made on the trunk of the trees only, on opposite side at about 3 ft. above the ground level.
- (3) The size of the blaze, to begin with, shall be cut 3 inches long x 3" broad x 1" deep so as to reach the wood. The blazes should slant downwards so that rainwater does not collect in the cavity of the blaze and cause rotting. Each tree shall bear only two blazes on either side on its surface during the currency of the lease.
- (4) (a) The first freshening will be done after three days of the initial blaze. This consists of scraping the edges of the blazes by 1/8 inch with a view to clear the clogged pores and to accelerate the gum-flow.
(b) Subsequent freshening will be usually once in a week and shall not be more than twice in a week. The size of the blaze shall not exceed 9" broad x 12" long in any case. Enlarging of existing old blaze, if any, should never be done.
(c) Digging into the wood during freshening is not permitted and should never be done.
- (5) The collection of the gum before it is dry on the tree should be avoided.
- (6) Tapping during rains is strictly prohibited and lease period for actual tapping shall be eight months fifteen days only; that is, each year lease for tapping the trees shall be from 1st October to 15th June, only.
- (7) Only 80% of the trees of *Sterculia urens* in the coupe shall be subjected to tapping and rest 20% will be left untouched. They will serve as seed-bearers for the propagation of this species.

- (8) The contractors will always send Mazdoor in to the forest for blazing the trees accompanied by responsible person or his Agent. The contractors or the Agents shall always give passes to the collectors of the gum or the blazers to prove that they are Working for him.
- (9) The contractor must maintain a register of receipt showing the name and address of the persons who bring the gum to his depot and the quantities actually received every day. This register will be subject to check and inspection by any Forest Officer.
- (10) The contractor shall maintain a register showing the actual number of trees tapping. All trees should be serially numbered.
- (11) The contractor shall be liable for any damage caused to the trees by the labourers or his Agent.

III. Grazing

Right to graze domestic cattle in the forests free has been entertained in almost all the cases in the forest of Dhalbhum Forest Division. This right is recorded in Khatian Part II and is exercised by the rightholders without let and hindrance. In fact, no particular attention is paid even to newly coppiced areas which are supposed to remain closed against for 5 years.

At the time, the number of cattle has gradually increased many times. Cattle are not only maintained for plough, the eart, the gohar and in some measure for milk, but quite a number are kept partly sometimes exclusively for the dung manure. Stall feeding and growing of fodder is almost unknown. Cattle are taken to forest where they graze almost for the whole day and brought back only in the evening.

The practice of maintaining cattle in this manner along with their increasing number, have already caused immense damage to forest crop and forest floor and the same is continuing unabated. The forests in the vicinity of thickly populated villages are the worst hit. The forests in such case have started

receding leaving blanks over appreciable areas along the fringes. The coppice shoots do not get established on account of heavy intensity of grazing and well stocked forest get thinned and opened up. This condition of the forests, exposes the compact forests floor directly to the on slaught of rains causing erosion. Forest floor is gradually losing its fertility on account of erosion and in many cases, every bit of soil is already eroded exposing the rock and boulders which lain underneath soil in the past.

The unrestricted grazing thus adversely affects the forest and forest growth and at the time creates favourable condition for erosion which reduces the fertility of forest soil.

Though the adverse effects of unrestricted grazing are well known, efforts to minimize such effects by regulating grazing are found completely wanting. This state has reached due to the difficulties one may have to face while enforcing any restriction on grazing.

But in view of the role played by the forests in the rural and national economy let apart the indirect contribution to agricultural economy, it is necessary to minimize the intensity of grazing and to regulate the same in the manner that least damage is caused to forests.

Two factors in this connection have to be reckoned with :-

- (i) Intensity of grazing – that is to say, number of heads of cattle grazing per acre.
- (ii) Duration – whether the grazing is continual or intermittent.

Regarding the intensity of grazing, experience in Uttar Pradesh has shown that optimum grazing results obtainable by allowing 2 acres of average forest to one cattle unit. The unit has the following measure.

One cow or bull or bullock or calf	-	1 cattle unit
One buffalo	-	2 cattle unit
One sheep or goat	-	$\frac{1}{4}$ cattle unit

Regarding duration, intermittent grazing is far less harmful than continual grazing. For example – over comparable plots, the damage by grazing by 10 units for 4 years would be less than damage by grazing by 5 units for 8 years.

In consideration of intensity of grazing and its duration the following suggestions are made.

(A) The forests which have already suffered on account of grazing have generally been prescribed to be managed as per prescription for felling series category B under coppice with standards working circle. For such forests rotation of 30 years has been adopted. In such forest grazing will be regulated in the following manner after a coupe has been felled over.

Rotation	No. of year subsequent to felling for which coupes will remain closed or open to grazing					
	Close	Open	Close	Open	Close	Open
30 Years	5	3	5	5	5	7

(i) In the 30 year rotation scheme, each coupe in the course of 30 years from the time of felling remains closed for 15 years and open for grazing for 15 years. Therefore, the percentage of permitted grazing is 50%.

(ii) With fencing in the forest to be managed under category B, it is expected that enough grass would come up within fenced area which may be given to villagers free provided they agree to follow the regulations suggested above.

(iii) In those forests, efforts should be made to keep the intensity of grazing to one cattle unit for every acres of forests.

(B) For the forests proposed to be managed under 40 years and 60 years rotation each coupe should be rigidly kept closed to grazing for 5 years after the felling.

Rotational grazing is not proposed in these forests, as they are comparatively safe and lie in interior where intensity of grazing is low. It would also be difficult to enforce rotational grazing all over.

It is recognized that it will not be an easy task for the Divisional Forest Officer to implement all the prescriptions in all the forests but at least over a few vulnerable forests, all the prescriptions should be given a sincere trial.

Felled over coupes where closure has been prescribed by rotational grazing scheme, the Divisional Forest Officer may change the period of closure of the regeneration and plantation if such area do not get established within the specified period.

Forest Fire

Cause of forest fire in Dhalbhum Forest Division and the damage caused to forest there by have been dealt in paragraph 52 to 54.

On various accounts, the problem of forest fire is treated as now, with more hope than efforts, with the available resources and their augmentation as far as practicable, there is a possibility of saving large tract of forests from fire provided the resources are applied in a planned way backed by sincerity and desire.

The following recommendations are accordingly made.

The forests may be divided into two parts :-

- (a) Those lying in the interior in compact blocks with very sparse population.
- (b) Those of comparatively high value lying in plains in compact block amidst thick population.

For type (a), it would be effective if the people are repeatedly requested to refrain from setting or causing fire in the forest during the fire season. Normally people inhabiting this type of forest are ignorant and generally not hostile to administration. In case, they must set fire in the forests as for picking mahua flowers etc. they may be shown alternative way of cleaning the forests-floor round the mahua trees.

(ii) An influential local man should be appointed as fire-watcher, whose duty should be to explain the villagers the damage caused to forest by fire and to see that they do not set or cause fire in the forests.

(iii) Exterior boundary lines, and boundary lines embracing last five coupes which ordinarily adjoin each other, and main paths inside the forest should be carefully fire traced. Burning should be done twice, once in end of February and the second in the last week of April.

For type (b), compact block or valuable forests say entire felling series should be made unit of protection. Maximum effective measures including the strength of Fire-watchers required to protect such selected forests should be employed. The present practice of allotting all the forests of a range to fire-watchers, knowing full well that there does not stand even remote chance of protecting these forests by them, leads to complete wastage of funds spent over the employment of fire-watchers. Instead, fire-watchers in adequate number may be provided for compact block of valuable forests who may succeed in protecting these forests. Fire-watchers must be influential local people.

(ii) All boundary lines, roads and paths inside the forest should be carefully fire-traced. Burning should be done twice, once in the last week of February and second time in the last week of April.

(iii) Printed hand-bills, explaining the cause of forest fire, the damage it does, the preventive methods and the law on the object, should be widely distributed.

(iv) Suitable sign-boards should also be fixed at important points.

(v) In case of forest fire, the services of the villagers may be availed under the provisions of Indian Forest Act.

(vi) There should be instituted a system of prizes for meritorious work in saving forest from fire either by prevention of forest fire or by promptly extinguishing it.

(v) Forest Roads

For proper development of the forests both silvicultural and economical, it is very necessary to have a network of good forest roads.

As stated in paragraph 65 of part I, there exists forest road 423 km in length. Some of the roads are very important both for extraction of forest produce and inspection.

The maintenance of these roads, however, is far from satisfactory which is mainly an account of funds. It needs no emphasis that road once constructed must be maintained thoroughly or the expenditure ever original construction goes waste.

All culverts and causeways need thorough repairs which lie on important roads.

VI. Maintenance of boundaries

At present due to increasing population, there is all round pressure on forest land and attempts to encroach forest land are always there. So the proper maintenance of boundary pillars is very essential.

It is therefore suggested that the maintenance of boundary pillars should be first and important charge of the forest guards. The beat officers must invariably check the boundary pillars once a year with maps and the Range

Officer check 50% of those reported by Beat Officer's in respect of the condition of boundary pillars and their position. The Divisional Forest Officer would ensure the compliance of the above by calling return from all, once every month.

It is also recommended that at each boundary pillars two morabha (aloes) plants may be planted in such a way that one of them is strictly in line with the preceding pillars and the other with the succeeding one. Every year during the rains aloe planting or replacement of causalities should be done.

It should be impressed on every one that proper boundary maintenance is the very foundation of forest management and therefore, who does not know the boundaries of his charge, does not know the forests.

VII. Removal of tanning Material by the local Tanners

Mochis, rightholders or non-rightholders, who do tanning work locally may remove free of charge tanning leaves, fruits and bark of trees. The chief tree from which tanning bark is taken is Asan (*Terminalia tomentosa*). In regard to the taking of leaves and fruits, there will be no let and hindrance. But since stripping of a tree of its bark causes its death in course of time, certain restrictions have to be imposed.

Stripping of bark may be done in the current coupes and in the coupes of the following year if already laid out. Standards shall not be stripped. Debarking of trees in these two sets of coupes will do no harm since these trees will be cut away the same or the following year.

If it is indispensable to take tanning bark from outside the coupes specified above, stripping of only malformed and moribund trees may be done.

Wherever commercial exploitation is possible the Divisional Forest Officer will prepare a scheme and obtain sanction there to.

VIII. Removal of fodder grass

Generally, fodder grass may be removed by rightholders or non-rightholders free of charge from the forests and plantation. Commercial removal of grass for trade or by any other Government Department from plantation areas may be charged as per rate fixed by the department from time to time.

Every effort should be made to get grass removed from the plantations either free or on payment. If found necessary, local people should be encouraged to prepare hay by cutting grass from plantation areas.

IX. Fruits and leaves

Rightholders have full liberties to collect fruits & leaves from any part of the forests for their own consumption. Leaves of Khair (*Phenax acaulis*) and Mahulan (*Bauhinia vahlii*) if removed for sale may be charged. If Khajur and Mahulan leaves occur extensively to permit commercial removal, it would be advisable to sell them in general auction, but it has to be ensured that the pluckers get their due remuneration as in the case of biri leaves collection.

X. Sample plots, Preservation plots etc.

Sample plots that may be laid out and their surrounds, preservation plots, protected trees and field experiments will be excluded from the operation prescribed in this plan.

XI. Buildings and wells

A list of building and wells constructed and maintained by the Forest Department is given in Appendix.

The buildings do not appear to be regularly repaired and white washes on account of paucity of funds. The maintenance of staff quarters is generally not satisfactory. Some of the Forest Guards quarters constructed in the early years of the creation of the division need replacement. The Divisional Forest Officer will prepare a list of such quarters and get them written off.

The Forest Rest House at Dublabera is in Richard condition and if major repair is help up for a year or two, it might collaps.

PART – II

CHAPTER VIII

CONTROL AND RECORDS

CONTROL

Standard from laid down in Chapter VI of the code of working plan procedure shall be filled in and maintained in the manner prescribed in the code. The period between 1st July to 30th June will be reckoned as the control year and control forms will be prepared accordingly.

Three complete sets of control forms have been prepared in loose-leaf clutch record. One set is for use and record in the Working Plans Division. One set is a flying set, which will be filled up yearly and sent to working plans officer within two months of the close of the control year. It will then be forwarded to the Chief Conservator of Forests, Bihar for approval of deviations, if any countersignature.

RECORD

In addition to control forms the following records shall be maintained.

(I) Felling series History :- This provides useful information of the results of application of particular silvicultural prescriptions to the forests on which proposals for further improvement are based. The importance of the upkeep of these Felling Series Histories in meticulous details can not be over emphasized.

A complete set in duplicate one for the Divisional Forest Officer and the other for the Range Officer have been prepared in the Working Plans Division and sent out to the Divisional Forest Officer. Summary of the work done, cost

incurred, outturn extracted etc. shall be filled in by Range Officer in his copy and from this Divisional Forest Officer will annually post his own copy up-to-date.

The following series histories will be checked annually by the Conservator of Forests during the course of office inspection.

FIRE RECORDS

Fire maps will be maintained on a scale 1"=1 mile for each range and the Division on the basis of Felling Series maps (4"=1 mile scale) on which areas burnt year to year are indicated by distinct symbol as per code of working plan procedure (Appendix).

The symbols should be different for every year as. The symbols beginning from 1985 would thus be :-

1985	
1986	///// ///// ///// /////
1987	_____ _____ _____
1988	++++ ++++ ++++ ++++
1989	----- ----- ----- -----

A brief note of the burnt areas will be recorded in Form (f) of the Felling Series History.

The Fire Map on 1"=1 mile scale would be maintained for 5 years. After that a fresh set of maps would be prepared.

FOREST JOURNAL

The forest journal should be maintained according to standing orders. This record may prove of immense value if the important silvicultural, administrative and management notes are regularly recorded. Instance of gregarious flowering, mortality shall invariably be recorded in the Journal.

PLANTATION JOURNAL

A Plantation Journal for each plantation series shall be maintained accordingly to standing orders. Important observations will be recorded in the plantation journal. Remarks, suggestions and instructions of inspecting officer with regard to plantation shall also be entered therein.

NURSERY JOURNAL

A Nursery Journal for each nursery shall also be maintained on the lines of plantation journal.

MAPS

(1) Felling Series maps :-

- (a) Stock maps have been prepared on 4"=1 mile topographical maps wherein crop, its density, extent of regeneration, etc. have been shown. Stock maps are enclosed in both the coppice of the respective felling series history.

- (b) Management maps have been prepared on 4"=1 mile topographical maps wherein the areas already worked, coupes to be laid out and their sequence have been shown. Management maps are enclosed in both the copies of the respective Felling Series history.

(2) Working Plan Map :-

This map is prepared on 1"=1 mile scale map showing all forests and their distribution in the felling series. Plantation already raised and plantable areas have also been shown. In addition, this map shown location of Range and Beat and Sub-beat headquarters, Forest Rest House and forest roads.

ESTABLISHMENT AND LABOUR SUPPLY

Executive staff : - At present executive staff of Singhbhum Afforestation are also operating with the territorial Jurisdiction of Dhalbhum Forest Division. In beginning of Singhbhum Afforestation Division, the main function of its staff was to raise plantation on the available areas and after completion of plantation work, the area handed over to the territorial Division. Which manage and protect it but now this system has been changed. After plantation the staffs of Afforestation Division used to take all necessary action regarding management and protection of it. In this way afforestation Division required more staff for management and protection of plantation and the jurisdiction are also overlaps in the same division.

In consideration of large scale plantations raised in Chakulia, Mango, Ghatsila Range covering almost all major available areas, re-organization of beat and sub beats has been suggested in Appendix – XIII.

The Divisional Forest Officer, territorial will take steps to get the new beat and sub-beat sanctioned for Chakulia, Ghatsila and Mango Ranges at an early date.

It will then be possible for the Divisional Forest Officer Singhbhum Afforestation Division to withdraw his staff in good number for the above mentioned Ranges.

The existing Ranges and Beats, their headquarters and Jurisdiction do not call for immediate re-organization.

GAZETTED OFFICER

The Divisional Forest Officer is in dire need of atleast two gazette assistants. One for whole final supervision of the plantation works and other for patrolling in forests from Protection point of view.

At present these two gazette assistants are already there and must remained in future. The succession List of the D.F.O.'s are given in appendix no. VII.

MINISTERIAL STAFF

The present strength of 16 ministerial staff – is adequate.

RANGE OFFICER

Posting of a Range Clerk to each Range Office has become very necessary. At present Range Officer has to do field and work single-handed and thus he is able to do justice to neither resulting in embarrassment and inevitable delay. Commonly a Beat Officer or a coupe overseer is entrusted with office work at the cost of field work which very often proves very heavy. It is, therefore, recommended that a whole time clerk may be posted to every range office, to allow Range Officer more time for proper supervision of his field work. The Beat Officer or the coupe overseer who is kept engaged in office, will also be free to devote full-time in the field.

PART – II
CHAPTER - IX

FINANCIAL FORECASE AND COST OF THE PLAN

The Dhalbhum Forest Division from the early period of the inception, it has been surplus division. The territorial area of this division has however, been changing till 1964. Revenue and expenditure figures since 1972-73 to 1986-87 (Till 15.01.87) is given below, shows it a surplus division.

REVENUE & EXPENDITURE FIGURE OF DHALBHUM FOREST DIVISION

Year	Revenue	Expenditure both Plan & Non Plan	(+) Surplus (-) Deficit
1972-73	1407889.00	727972.00	(+) 679917.00
1973-74	1669631.00	633621.00	(+) 1036010.00
1974-75	3138772.00	1487529.00	(+) 1651243.00
1975-76	3150840.00	757061.00	(+) 2393779.00
1976-77	4068991.00	1796579.00	(+) 2272402.00
1977-78	4650803.00	2286547.00	(+) 2364256.00
1978-79	5081374.00	2303697.00	(+) 2777677.00
1979-80	4014272.00	2075927.00	(+) 1938345.00
1980-81	3718899.00	2038230.00	(+) 1680669.00
1981-82	3421450.00	2517436.00	(+) 904014.00
1982-83	1373538.00	2510502.00	(-) 1136964.00
1983-84	1902826.00	2589489.00	(-) 68663.00
1984-85	2368444.00	2830935.00	(-) 462491.00
1985-86	1951670.00	3289414.00	(-) 1337744.00
1986-87	3135906.00	2426237.00	(+)709669.00
(Upto 15.01.87)			

The above revenue figures, have been obtained in the division due to increase in the price of Forest produce including minor Forest produce, improved communication & better utilization of forest produce.

Expenditure :- The annual expenditure of the division from 1972-73 to 1986-87 (Till 15.01.87) has been shown in the above table. The annual expenditure is inclusive of plan & Non-plan allocations.

The implementation of the prescriptions of the plan may lead to nominal increase in the expenditure which has to be provided or also the improvement Visualised in it, may not be achieved.

Cost of the Plan

1. Cost of enlarged topographical maps	452.00
2. Working plans works	1,44,000.00
3. Pay of W.P.O.'s (Proportionate)	22,360.00
4. Pay of A.W.P.O.'s (Proportionate)	27,000.00
5. T.A. of W.P.O.'s	29,825.00
6. T.A. of A.W.P.O.'s	24,241.00
7. Pay of subordinate staff	3,98,919.00
8. T.A. of subordinate staff	44,773.00
9. Cost of living allowances	1,61,248.00
10. Other allowances	4,640.00
11. Contingencies	58,461.00
	<hr/>
	9,15,919.00

The area of the Dhalbhum Forest Division is 2,37,065.32 Acres/94826.12 Hect. The cost of the plan works out to Rs. 3.86 per acre / Rs. 9.66 per hectare.