

CHAPTER — V

PAST SYSTEM OF MANAGEMENT

1-5.1 GENERAL HISTORY OF THE FOREST: - Except for the forest of Horhap which was declared **reserved** as early as in 1983, all the forests of Ranchi District were under the dispensation of the Zamindars. In spite of best terms offered by the Govt., for transfer of Zamindar(Private) Forests to Govt., control under section 38 of the Indian Forest Act, the Zamindars were most reluctant to join hands. In fact Sec. 38 of I. Act left the whole initiative in the hands of owners and if the Zamindars did not apply for management to be taken over by the Govt., the latter could do nothing for taking over management of private forests by the Govt. particularly on Ranchi Plateau and the slopes around it, which constitute the large catchment areas of the rivers responsible for the flood havoc in Orissa and Bengal, by a suitable legislation. The Zamindars, anticipating the enactment of the Bihar Private Forest Act for taking over management of privately owned forests by the Government,

Entered into long term leases with contractor consequently negotiable forests were not only heavily exploited but were also subjected to high cuttings. Hence the crop from the high stumps was defective and the value of the forest was lessened.

1-5.2 The felling was so extensive and intensive that even today the crop in general, of Ranchi East Division looks as if it has been worked for a full rotation. The hurried cutting at high stumps and its repetition by villagers has converted large areas into rooted wastes. The distant inaccessible forest, however, escaped the onslaughts, and they still have a good stand. In 1946 the Bihar Private Forest Act was enacted and the Govt., took over control to rehabilitate the forest scientifically.

1-5.3 PAST SYSTEMS, MANAGEMENT AND THEIR RESULTS: - Before the reservation of the forest under Sec. 38 of P.P.F. Act, there was no regular systems of working. People of the villages removed their requirement of forest produce without any hindrance. As the reservation process progressed, systematic schemes were drawn up for different areas.

The earliest Working Scheme was that for the Horhap Reserve Forest prepared by Mr. Kirkpatrick in 1905. Silvicultural system prescribed was “Coppice with-Standards” (Standards up to 30 per acre). A rotation of 25 years was adopted. This system continued till 1931. The total area worked over under this scheme till March 1931 aggregated to 725 acres (Coupe 1 to 19) inclusive of coupe no. 17 which was not felled owing to its poor quality and the lac plantation area of 130 acres which was clear felled. This system worked for 15 years with fairly satisfactory results. This working scheme was allowed by Mr. Moony’s working plan which came into operation from the 1st April 1939. Here the system adopted was simple coppice, though a very limited number of selected trees were to be left as seed bearers. The rotation of 25 years was continued. The important feature

of this plan was that a device was adopted to carve out annual equip productive coupes though in practice this could never be achieved. The rotation of 25 years was found to be too short. The prescription with regard to cleanings, which consisted of cleaning in the year following the main fellings and thinnings in the 8 year was found not sufficiently effective to control Lantana in the newly felled over coupes. Burning of debris in the annual coupes was totally omitted. However, on the whole the results of the prescription of this working plan were quite satisfactory.

In case of other State owned forests no regular scheme or working plan could be drawn up till 1951 as the forest settlement proceedings could not be completed earlier, never the less the demands of right-holders were satisfied by fellings roughly on the lines of coppice system.

The private owned forests which were taken over under Sec. 38 of ?f Act there always existed some sort of Working Scheme or Working Plan under which they were worked. A brief summary of working of these forests under different scheme and plans is given below.

1-5.4 INDBAN R.F. The forests of Indban R.F stretches over Dehkela, Murup, Govindpur, Rehargara and Jalanga villages. The forest was declared reserved in Govt., notification dated 24-03-30. Working Scheme was drawn up for 20 years to be enforced from 1-3-1928. This scheme expired in 1948. The system applied was coppice-with-standards. The forest was well maintained under this scheme. On the expiry of this scheme a regular Working Plan was drawn up by Shri H.D.Singh in 1957 in which all such forests under agreement were dealt with.

1-5.5 SILWAI R.F.:- Silwai Forest was declared reserved by Government in 1930. The first Working Scheme was drawn up by Mr. F.A.A. Hart in 1928 which was sanctioned for a period of 18 years commencing from 1930. Out of the total area 316.62 acres 225.24 acres lying South of the railway line were closed to right- holders and treated to light improvement fellings on a 20 year cycle. The northern block of 91 ;38 acres was put under simple coppice to meet the rights. Here reduced areas method was to be adopted. Prescriptions for the southern blocks continued till 1941-42. Later on from 1942-43 Selection coupes were subjected to coppice-with standards fellings with 8-10 standar.is per acre. The prescriptions could not be strictly followed in northern block due to indifference shown by right-holders in exercising their rights, in southern block the prescriptions were rigidly followed. After the scheme expired in 1947-48 until 1950-51 when Mr. H.D. Singh's plan came into operation no regular fellings was carried out in northern block where as in southern block coppice-with-standards felling were carried out in coupe 1-3 which were treated originally under light improvement fellings. Later on when Mr. H.D. Sirigh's Plan came into operation from 1952-53 the entire R.F. was put under coppice-with- standards system under 30 years rotation in Quasi-Commercial Group.

1-5.6 PATRATU R.F. It belonged to Rajguru S.N. Rao Pendos and was declared reserve forest in 1936. The first Working Plan which was drawn by Mr. A.R. Sharma came into operation from 1st November 1936. The system adopted was coppice- with-standards under 40 years rotation. Standards to be retained were 10 per acre. Two cleaning 1st in the year following the main felling and the 2st in the fifth years, if found necessary were prescribed. None of the operations was caned out efficiently. Even then, in the coupes which were worked over, coppice regeneration

obtained was fairly satisfactory. In H.D. Singh's Plan this was worked under coppice-with-standards system under 40 years rotation and was placed under Quasi-commercial.

1-5.7 RANCHI ZAMINDARI FORESTS: - The first Working Plan in respect of Zamindari Forest was drawn up by Shri A.R. Sharma in. The prescriptions here were more or less same as that of Patratu except that the rotation was reduced to 30 years, the result obtained from the past treatment were just the same as in the case of Patratu forests in H.D. Singh's Plan. These were put in Quasi-Commercial-Group and the system adopted was coppice-with-standards under 30 years rotation while the rest under 40 years.

In regard to private owned forests where the Forests settlement proceedings had not been completed, no regular Working Plan of Scheme could be drawn up. However to meet the immediate needs of the surrounding population several of these forests were grouped into a number of felling series and fellings similar to coppice system were carried out.

On the whole it can be said that upto 1952 a greater part of the forest had been worked under coppice with standards system and the results of various Working Scheme had been generally satisfactory.

In the forests taken up under B.P.P. Act, coupe systems was introduced as the first step towards scientific management. Coupes were opened for villagers in all the village units of the forests. The coppice with standards system the produce was sold for supply to the Non-Right-Holders.

1-5.8 The first systematic Working Plans of Ranchi Forest Division was prepared by Shri H.D. Singh in 1951 which in fact was Revised Working Plan in respect of about 50% of the forest and original one for the rest, taken under Sec 2 of the LF.Act. Though this plan was intended to be brought into force in 1952-53, it actually became operative from 1954-55 in some of the felling series and in others still later. The introduction was not uniform all over the division.

In Mr. Singh's plan the following Working Circles were prescribed.

1. Selection Working Circle.
2. Coppice Working Circle.
 - a) Non Commercial Group.
 - b) Quasi-Commercial Group.
 - c) Commercial Group.
3. Bamboo Working Circle.
4. Kath Working Circle.

5. Miscellaneous Working Circle.

1-5.9 No Forest under Selection Working Circle exists in the existing Ranchi East Forest Division.

1-5.10 The Coppice Working Circle :- *In Mr. Singh's Plan an effort was made to lump the forests into a number of felling series according to the convenience of the right holders.*

1-5.11 In good many cases attempt was made to form village wise felling series to meet the rights. For this purpose the procedure adopted was like this. In each village suitable extent of forest area depending upon the number of right-holding households (3 acre per household) was set apart and the area so set apart was treated as a separate felling series purely to meet the admitted rights of the right holder usually on rotation of 30 years. The balance area were then suitably grouped with similar areas of other villages, so as to form a separate felling series mans for revenue on rotation of 40 and 60 years.

1-5.12 The forests under Coppice Working Circle were broadly classified into three main groups: (a) Non-Commercial (Group — (A). As stated earlier the whole forest or the portion of the forest of a village, depending upon the number of household was set apart for meeting the rights. Felling series in most cases was village-wise and exclusively for the bonafide consumption of the right-holders. This worked satisfactorily in few P.F.s e.g., Masiatu, Silwai, etc. but where the demand was poor the coupes were not worked at all. The drawback of this arrangement was that abnormally large number of right-holders coupes were to be laid out. Consequently the local staff used to experience difficulty in supervising as well as laying out coupes. Prescribing two rotations in the same forest under two sub-working - brought about difference into the converted crop instead of uniformity which be the aim.

1-5.13 QUASI-COMMERCIAL (GROUP-B):- This group included the areas the annual coupes of which were in the first instance open to right-holders and the surplus if left over was sold in the second year. The coupe purchasers had to set right the bad stumps. This group embraced mostly those areas which were formerly worked under some Working Plans or Scheme. The usual rotation adopted was 40 years but in certain it was raised to 60 years while in others it was lowered to 30 years.

This arrangement worked satisfactorily all over except in few cases where blanks and unproductive areas occurred coupe-sequence had to be changed. There had been slight deviation from the prescription. For instance, in Tamar R.F. which was put under Quasi-Commercial Group under 39 years rotation selection fellings were made under Division Forest Officer's Scheme removing almost all the mature trees.

1-5.14 COMMERCIAL (Group — C) :- All the forests which were not required to satisfy any rights and were to be managed purely for revenue purposes were put under this group. It included the R.Fs and those portions of right-burdened forests which had remained over after setting apart adequate portion for right-holders. In general the rotation was fixed at 60 years but in certain cases it was lowered to 40 years. Commercial coupes were worked fairly well. Laying out of the coupes along the contours caused

difficulty in extraction of forest produce, however this was modified later on according to the instructions of the Chief Conservator of Forests, Bihar, From 1962.

The number of standards to be retained under Shri H.D. Singh's Plan varied from 5 to 15. Where rotation was 60 years the number of standards was prescribed at 10 to 15 and in the forests of 40 and 30 years rotation the number of standards was fixed at 8 to 10 and 5 to 10 respectively. It was observed that due to very standards the worked over areas in the last two looked like clear felled patches.

Elaborate and sound prescriptions for laying out coupes, marking standards, execution of fellings and subsidiary operations had been laid down Singh's Plan. Three thinnings in **15th 30th 45th** years in case of 60 years rotation, in case of 40 years rotation in **1 4th and 22d** years and one i.e. in **15th** years in c 30 years rotation, had been prescribed. These could hardly be enforced any v in the division. Wherever thinning was done it had no bearing with prescriptions the thinning programme as prescribed in the plan. Instances are there thinnings had been carried out in coupes which would form a coupe in the very future. Considering the poor site quality and open crop, three and two thinning not appear to be necessary.

1-5.15 BAMBOO WORKING CIRCLE: - Under Mr. Singh's Plan there were seven fellings series, out of which only four concern the existing Ranchi East, Division. The Bamboo Working Circle received very little attention during the and was rarely exploited commercially. The conditions of bamboo in other so poor that it would hardly be saleable by annual auction. Petty sale by per allowed to the "Turees" but proper control over them seems to have been exercised. Mr. Singh had prescribed cutting cycle of 5 years which does not to be sound. Experiments so far carried out show no change in quantity and a of clump production between 3 years and 4 years cuttings cycle. In fact 3 cutting cycle enables quicker check up of effects of last Working with better returns.

1-5.16 KATH WORKING CIRCLE :- A separate Working Circle was Mr. Singh's Plan for Kath and 100% enumeration was carried out for fixing the The annual yield prescribed was 84 trees above 8" diameter which was neither commercially exploitable nor did it attract any contractors. With the exception of very scattered trees occurring on the border of Hazaribagh, Khair is rarely noticeable any where in this division. Creation of separate Working Circle for Khair was not necessary.

1-5.17 MISCELLANEOUS WORKING CIRCLE :- No area under this working circle has ever been worked. The twelve acre plot of Mahilong R.F. has been utilised in making a nursery and a Forest Guard Training School. No other operation was carried out. Parts of Jaria Estate Forests of Indban R.F. was put in this working but regular felling was not prescribed as Indban R.F. was being worked under Working Scheme of 1928 duly approved by Govt. There appears however no need of this Miscellaneous Working Circle.

The coupe number of all the felling series of Coppice Working Circle are not the same. In some places coupe numbers of old Working Plans were retained and else where fresh coupe numbers started from 1961-62.

(a) Indban F.S. — Rahaçara C.C. 35 of 1962-63 (Jariya Range) which is in constitution of the old Working Plan and not of Mr. Singh's revised Plan.

(b) SiIwai F.S. — (Ranchi East Range) — Silwai R.F. C.C. 15 of 1962-63 which is according to old plan and not according to Mr. Singh's Plan

(c) Sosokuti C.C 5 of Tamar Range of 1962-63 according to Mr. Singh's Plan. No stock mapping was carried out by Mr. H.D. Singh though worked over areas had been shown in the felling series history map. As a result the gross area of the forest of a felling series formed the area of Salai and bamboo even though these occurred in patches in a felling series. Laying out of coupes on this basic resulted in a wide *disparity in the year to yield and in certain cases areas not containing the particular spp. formed a part of the coupe producing no yield. Wholly unproductive area in a number of coupes which could neither be sold nor the right-holders could be supplied with their requirements.* Horhap Khalsa R.F. can be taken as an example where due to unproductive areas felling in the entire coupe, the *sequence* of the coupe had to be changed.

1-5.18 SINHA'S PLAN FOR PROTECTED FORESTS :- Mr. Sinha's plan from 1954-55 to 1 963-64 for protected forests vested under Land Reforms Act, 1950 was prepared for the first time but the prescriptions could not be put into practice in all the protected forests from that year.

1-5.18 In Mr. Sinha's Plan the following Working Circles were formed:-

1. Right-holder Coppice Working Circle.
2. Commercial Coppice Working Circle.
3. Protection Working Circle.
4. Bamboo over lapping Working Circle.
5. Salai overlapping Working Circle.

1-5.20 RIGHT HOLDER'S COPPICE WORKIG CIRCLE: - Each village unit of forests was constituted a felling series and annual coupes were laid out in each of them. A large number of

coupes were prescribed to be laid out for the right-holders in P.Fs only. This abnormally large number of coupes (some of them being 1 or 2 acres) was great hindrance to forest administration for laying out of coupes as well supervision. Silvicultural attention in concentrated way could not be give to all the coupes nor was it practicable.

1-5.21 The usual forestry practice in the management of right-burdened group two, three or more village units of forests into felling series. Coupes

out from one end, felling proceeds to the other and all the participating villages take their requirements from the annual coupes of the telling series in whichever village it may happen to lie at the time. By doing this the laying out of right-holder coupe in each individual mauza is obviated, saving labour and expense while the group of villages share the fat and the lean in equal share. This administrative and silvicultural reasons seems to have been omitted altogether by Mr. Sinha. More attachment of the villagers with their forest shod not be the criteria for constituting a separate felling series in each village.

1-5.22 Two different rotations of 20 years and 40 years were prescribed in Mr. Sinha's Plan, the former for smaller areas and the latter for larger areas. In protected forests where grazing and other biotic factors play an important role in depletion of the firewood and fencing materials. Elaborate and sound prescriptions for laying out of coupes, marking of standards, execution of fellings, cleanings and thinnings programmes and duties of Gram Panchayats and right-holders were laid down in the plan but these were hardly followed anywhere in the division. A number of recommendations were made in Mr. Sinha's Plan to tackle Mundari Khutkatti forests and in fact great hopes were expressed that the surplus area would be sold to Khutkattidars first and after they refuse, to contractors with the consent of Mundas. However, it was observed that nothing could be achieved and Mundari Khutkatti Forests remained still a problem.

1-5.23 COMMERCIAL COPPICE WORKING CIRCLE:-To meet the requirements of the Non-Righ) Holders and for trade and export the right-free forests were grouped into suitable felling series for commercial exploitation: Rotation prescribed was 40 years and number of standards 8-12 per acre. In large number of cases, the annual area prescribed was too small to attract any contractor. In Mr. Sinha's Plan some of the forests which contained very poor crop were grouped into a felling series and placed under coppice Working Circle. These forests were later on made over to Afforestation Division for rehabilitation. Some of the protected forests put under Commercial Working Circle containing mostly bare, rock and unproductive area. Out of 33 felling series of Commercial Coppice Working Circle hardly 18 series could be exploited. Detailed instruction regarding cleaning operate regulation of grazing, marking of standards, execution of fellings as laid down in Sinha's Plan were never followed.

1-5.24 PROTECTION WORKING CIRCLE: - In Mr. Sinha's Plan protection Working Circle was created with a view to give complete rest to these forests which needed temporary immunity from cuttings. These included (a) Bare or too sparsely clothed rocky hillocks, (b) Sal pole forests

on plain land with bare floor, (C) Good Sal sapling forest, and (d) Gullied land with sparse vegetation.

These forests were prescribed to be placed in complete charge of Forest Panchaayats. One of the recommendation was that, if possible Forest Guards might be withdrawn from these forests for economy as well as to generate sense of greater responsibility in the local population. Further a prescription was given to make trench fences in areas containing Sal for protection. The prescription of transfer of forests to Panchayats was followed in case of few forests but significant results could not be achieved. Some protected forests under protection working circle had been made over to Afforestation Division for rehabilitation. In these areas the Afforestation programme is going on satisfactorily.

The very idea of creating a 'rotection Working Circle in Mr. Sinha's Plan been defeated because due to practically no departmental activities in these forest theft increased considerably and good Sal poles were removed by villagers illicitly bringing further depletion of the forests under protection working circle.

1-5.26 BAMBOO (OVER-LAPPING WORKING CIRCLE):- In Mr. Sinha's Plan there were altogether 25 bamboo felling series in Ranchi Division. The number of felling series falling in Ranchi East Division is not traceable. However, the results for this working circle are like this. Except for intermittent, irregular and unsystematic working in only few felling series, the remaining ones were not touched at all for commercial exploitation. In fact, Ranchi East Division in general, is very difficult for bamboo working. A cutting cycle of 3 years was prescribed in Mr. Sinha's Plan with a view to remove congestion as soon as possible. However it was found that in almost all the cases the cutting cycle was raised to 4 years. No effort was made during the plan period to rehabilitate the clumps, consequently the condition of bamboo crop deteriorated from bad to worse. Turis, who prefer only second year culms for manufacture of baskets etc. have accelerated the process of deterioration. Possibly due to lack of fund, silvicultural operations such as cleanings etc. appear to have been totally neglected in the bamboo forest. As a result of mismanagement of bamboo forest none of the bamboo coupes could attract the contractors. So prescription of Mr. Sinha's Plan for the improvement of bamboo crop could not be carried out.

1-2.27 SALAI (OVER LAPPING) WORKING CIRCLE: - In Mr. Sinha's Plan only those areas of Salai were included in this Working Circle which could have been economically extracted. Other'salii bearing areas such as Rahha, Kanta-toli and Kudagara R.F. in Ranchi East & West Ranges, Ghagharabera, Lungtu and Sataki etc. in Tamar Range and many other salai bearing areas were left out in Mr. Sinha's Plan on the ground of extraction difficulties.

The yield was fixed by area and felling cycle was fixed at 15 years. No effort was made to form equi-productive coupes. In the absence of stock maps and also of enumeration, sustained yield could not be ensured. Consequently all the exploitable salai trees were removed within a period of less than 5 years so much so that no coupe of Salai could be laid out during 1962-63 and onwards. The distribution of trees in lower diameter classes was not well represented.

Removal of all exploitable trees above 12" diameter was prescribed in Mr Sinha's Plan ignoring completely the fact that there were no trees to pass over to the next higher classes. 10 years scheme extended to other Salai bearing areas e.g. Joreya, Harbul and Ghagharbera etc. in Tamar Range and it operated for two years i.e. in 1960-61 and 1961-62. According to this scheme Salai trees were also removed from Jariya Khaman of Jariya Range during 1960-61. In fact the felling have been done and suggested in few felling series without ensuring sustained yield. It would have been more desirable to exploit Salal with proper safeguard for sustained yield. The possibility of working of Salai in future has been examined in detail but this would not be commercially exploitable.

1-5.28 The prescription of the village-wise coupe in the right-burdened forests under the right holder's Coppice Working Circle increased the work load much in excess of the staff could cope with. In few cases the prescriptions of the plan were enforced from 1954-55 e.g. Haratu, Ichadag of Ranphi Range but in many other areas e.g. Sadma, Dumargari, Kheslatoli etc. the prescriptions could not be enforced as late as 1958-59. In most of the areas Siriha's Plan was not enforced at all. In fact, the entire plan was followed on the whole for a year or two. Subsequently the Divisional Forest Officer enforced his Scheme in P.Fs by reconstituting of felling series by the Divisional Forest Officer was total departure from the prescriptions of the approved

Working Plan, it however brought all the benefit silviculturally and administratively. The bold step of regrouping the villages into suitable felling series may be regarded as a land-mark in the history of protected forest of Ranchi Division. The villagers who were so strongly attached to the forests of their own individual villages taking their share from a common lot. However, laying out of the coupes according to reconstituted felling series also could not be enforced uniformly all over the division.

1-5.29 No stock mapping was proposed by Mr. Sinha for his plan as a result the gross area of the forest of a felling series formed the area of Salai and bamboo even though these occurred in the felling series in patches either over-lapping or seggregating, The laying out of coupes on this resulted in wide disparity in year to year yield and in certain cases areas not containing the species formed the part of a coupe, producing no yield. Wholly bare areas formed coupes where no operation either for felling and removal of forest produce or for restocking the areas was carried out resulting in no improvement of the condition of forest growth.

1-5.30 FIRE PROTECTION :- Measures of fire protection adopted consisted of clearing and burning the outer boundary lines and fighting any out breaks of fire with the help of the villagers. Due to paucity of funds under this head fire protection measures have proved grossly inadequate and in some of the Range practically nothing has been left to protect the crop form fire hazards.

I- 5.31 MR. R.N. KAPOOR'S PLAN :- Mr. R.N. Kapoor's Plan for the reserved, protected and private forests of Rarichi Division (Ranchi East & West) were prepared for the period from 1964-65 to 1983-84. In Mr. Kapoor's Plan the following Working Circles were formed :-

1. Coppice-with-Standards Working Circles;
2. Soil Conservation Working Circle;

3. Plantation Working Circle; and
4. Bamboo (Over-lapping) Working Circle.

1-5.32 COPPICES WITH STANDARDS WORKING CIRCLE: - This Working Circle embraces only those forests which are fit for working. Attempts had been made to classify the forest under this Working Circle into three groups, namely

- (A) Group A Community;
- (B) Group B Quasi-Commercial; and
- (C) Group C Commercial;

according to the quality of the crop and the nature and extent of rights.

1-5.33 GROUP 'A' COMMUNITY: - This group embraces the forest which are just enough to meet the demands of right-holders. The total area of this group was 71360.98 Acre! 28891.08 Ha and 82 felling series were constituted. The rotation was 30 years.

I- 5.34 GROUP 'B' QUASI-COMMERCIAL:- This group embraces the may or may not have any surplus left over after meeting the requirements. The total area allotted to this group was 57394.05 Acre / and the rotation was kept at 40 years. Total no. of felling series was 115.

1-5.35 GROUP 'C' COMMERCIAL: - This group constituted the forest right-free. The total area felling under this group is 5735.98 Acre / 2322.26 the rotation was kept at 60 years. Total no. of felling series was 5.

1-5.36 SOIL CONSERVATION WORKING CIRCLE :- This Working Circle all such forests which needed rehabilitation and plantation. The forests Working Circle have been divided into five types, namely

1. Sal rooted wastes;
2. Miscellaneous rooted wastes;
3. sal pole forests on plain land with bare floor;
4. Good Sal sapling forests; and

5. Bare or too sparsely clothed rocky hillocks.

Total area allotted to this Working Circle is 22649.07 Acre / 8360.00 Hact. and separate treatments were prescribed for each group.

1-5.37 PLANTATION WORKING CRICLE: - This Working Circle comprised all areas which were already planted and considered fit for plantation. Total area allotted to this working circle was 21528.89 Acre / 8716.15 Hact. and special treatments were prescribed for this working circle.

1-5.38 BAMBOO OVER-LAPPING WORKING CIRLCE :- This Working Circle constituted the predominately bamboo bearing areas which were ascertained through stock mapping. The total area allotted to this working circle was 8805.88 Acre / 3565.18 Hect. which over lapped the C.W.S. as well as rehabilitation working circles.

1-5.39 RESULTS OF MR. KAPOOR'S PLAN: - Mr. Kapoor's Plan included for Reserved and Protected forests and no specific prescriptions had been made for the private protected forests (Mundari-Khutkatti Forests). The reason for this had been the inability in the past to enforce any working plan's prescriptions in these forests. It had been suggested that these forests may continue to be managed according to the Govt. instructions received from time to time.

I- 5.40 About 202 felling series were prescribed for laying out of coupes. Out of these 82 felling series were meant for the right-holders, 115 felling series were meant for right-holders and the department & the rest 5 felling series meant for the Department only. Although the prescriptions made were elaborate and sound in the plan, it could not be enforced throughout the Division. Deviation from the Plan's prescription and high incidence of illicit felling, grazing and fire caused the deterioration of forest this Division.

1-5.41 In Mr. Kapoor's Plan Soil Conservation Working Circle was created with view to give temporary rest to those forests which needed immunity from cutting and improvement of pole crops. But the very idea seems to be defeated because there were practically no departmental activities in these forests. Illicit felling increased considerably and good Sal and other miscellaneous poles were removed by villagers causing thereby further depletion of the forests under Soil Conservation Working Circle.

1-5.42 Forests under Plantation Working Circle were worked together by Ranchi East Forest Division and Ranchi Afforestation Division. It became more active in the beginning and the results were satisfactory but at later stage the idea of the plan seemed to be defeated due to the protection of raised plantation.

1-5.43 There were altogether 6 bamboo felling series in Ranchi East Forest Division These cutting series were seemed to be untouched for commercial exploit fact; Ranchi East Division is poor in bamboo crop and very difficult for ban working.

PART—I

CHAPTER — VI STATISTICS OF GROWTH AND YIELD

1-6.1. In framing the estimates of annual yield or in fixing the rotation, the felling cycle, etc. data from Research Plots have been used. The quality generally is Coppice 'B' at a few places it is Coppice 'A'

1-6.2. Attempts have been made to collect statistics of yield from worked over areas

Thus the average yields for the respective year are tabulated as below.

Year	Area worked in acres	Timber		Poles in No	T.L.	F,W in m3
		SaI3M	Misc3M			
1	2	3	4	5	6	7
1988-89	15.20	1.4940	0.5370	-	9077	97.2
1989-90	58.12	88.962	1173.0472	6966	33256	83.1
1991 -92	21.96	9.7738	5.5062	537	587	57.0

1993-94	10.50	-	-	-	275	21.9
1994-95	21.48	5.1427	7.0497	643	2715	39.3

AVERAGE

Year	Timber in 3 n	Poles Nos.	T.L. Cogg. in	F/w in 3 m
1988-89	0.0423	-	188.320	20.166
1989-90	8.0000	44	210	5.2555
1991-92	0.6958	24	27	2.5956
1993-94	-	-	26	20.8570
1994-95	0.5676	30	126	18.2960

1.6.3. Partial enumeration has been carried out in Sal bearing as well as miscellaneous areas in order to ascertain working of coupes. At present the condition of crops except Khunti., range are of sapling and pole stages. Hence increased emphasis must now be given for protection and improvement of the forests rather than gaining revenue from them. Forests of Ranchi East Division are to be given rest for the coming ten (10) years and thinning programmes are to be implemented during these years except in JFM areas where due to effective protection the crop has come up very well.

CALCULATION OF YIELD

Diameter and age figures from various sample Plots of Sal crop at different locations have been used for this exercise. Summary of sample plots statistics is appended below. Diameter class at a difference of 5 cm i.e. 0-5 cm, 5-10, 10-15, and 15- 20 cm were fixed and the number of trees falling under it enumerated. Since sal trees above 15 cm diameter have been decided as “selection tree”, a certain percentage of which will be prescribed for felling.

After classification of data weighted mean crop diameter was calculated at different age by using following formula weighted Mean Crop diameter

$$D = \frac{n_1 d_1 + n_2 d_2 + n_3 d_3 + \dots}{n_1 + n_2 + n_3 + \dots}$$

Where n_1, n_2, n_3 are the number of trees in each diameter class and d_1, d_2, d_3 are the average diameters of the diameter class. From the above method, Age- Diameter graph have been drawn on graph sheet to determine the value of “t” (the value of “t” and could have been obtained with greater accuracy by enumerating larger sampling intensity) and later to determine value of X. The trees of the diameter class 10-15 cm are classified as II class or approach class trees, while all trees above 15 cm and upward are classified as I class trees or selection trees.

Felling cycle:- A felling cycle of (a years have been fixed.

Exploitable diameter: - The exploitable diameter of sal for pole purpose prescribed to be 15 cm and above, which is quite useful for agriculture and hour uses.

Method:-

The yield of selection trees is lokód out according to Smythies guarding formula, Which defines the yield available during the felling cycle as the nur of trees of the next lower diameter class II that may be expected to survive and grow ii into the exploitable size (class I) during the felling cycle:

The formula

$X = f/t(II - Z\% \text{ of II})$ where

X = The number of II class trees of 10cm to 15cm diameter that survive and pass into the next diameter class (1st class)

f = The length of felling cycle in years.

t = The average length of time in years that it takes the class II trees to pass into class I

II =The number of class II trees enumerated i.e. tress between diameter 10 cm to 15 c.

Z = The mortality percentage that in the percentage of class II trees that in the percentage of class II trees that disappear, from any cause during ‘t’ years.

The annual yield is that expressed as percentage of the selection trees present in the coupe at the time of making. This is worked out by the formula: -

$$Y = \frac{X}{\frac{100 + A}{I + X12}}$$

Where Y = The annual yield expressed as a percentage.

X = The yield during the felling cycle as worked out in the previous paragraphs.

I = The number of class I trees as enumerated.

A = An arbitrary value adopted for purpose of adjustment or rounding of figures.

For value of t and z:-

From the Age — diameter graph, the value of 'V' for Sal it appears that a 10 cm diameter tree takes 15 years to attain the diameter of 15 cm. The value of Z have been obtained from sample data, which is equal to 41%

We get: -

II class tree 145

I class tree 26

Hence, $x = 10115(145-41/100 \times 145)$

$X = 2/3 (145-59.45)$

$X = 2/3 (85.55)$

X = 57 tree

= 57/3 ha = 190 tree/ha.

Here the annual yield is a percentage of I class trees found by the m off icers and not a yield by volume, basal area or *number of* trees.

Limitation of the method used.

i) In above calculation since I is less than $x/2$; hence calculation of “y” is impractical.

ii) Since the removal of class I trees will depend on silvicultural availability and the extent to which regeneration is present, yield is bound to vary.

iii) Yield in the second felling cycle will depend on the number and behaviors of III class trees, if its proportion is less, yield is bounded to fall.

iv) This method of yield regulation is essentially a method of yield by area (equiextensive coupes) with a check on the number of trees to be removed. Theoretically to have an equal yield of I class trees, there must be even distribution of I and II class trees throughout the felling series and there should be no bar, silvicultural or any other, to the removal of calculated number.

Further, it is abundantly clear from enumeration data that the crop in most of forests is young varying in age from 10-15 years. It is also congested and hence requires improvement which can be done by silvicultural operations Uk thinnings, cleanings etc.

S.P. of Ranchi East Division

Sal Coppice Crop

Serial Number	Formation	Age	VoI M ³ ha	C.A.I. m ³ /year/ha	M.A.I m ³ /YEAR/ha.
1	2	3	4	5	6
1	1954	1	2.2500	2.2540	2.2500
2	55	2	4.25	2.0000	2.1250
3	56	3	5.75	1.5000	1.9166
4	57	4	7.5	5000	1.8750
5	58	5	9		1.8000
6	59	6	11.5	2.5000	1.9166
7	60	7	13.5	2.0000	1.9285
8	1961	8	15.5	2.0000	1.9375
9	62	9	18	2.5000	2.0000
10	63	10	20	2.0000	2.0000
11	64	11	22	2.0000	2.0000
12	65	12	24	2.0000	2.0000
13	66	13	26.5	2.5000	2.0000
14	1967	14	28.5	2.0000	2.0000
15	68	15	30.5	2.0000	2.0000
16	69	16	32.5	2.0000	2.0000
17	70	17	35	2.5000	2.0588
18	71	18	37	2.0000	2.0555
19	72	19	38.75	1.7500	2.0394
20	1973	20	40.75	2.0000	2.0375

21	74	21	42.5	1.7500	2.0238
22	75	22	44.5	2,0000	2.0227
23	1976	23	46	1.5000	2.0000
24	77	24	48	2.0000	2.0000
25	78	25	49.5	1.5000	1.9800
26	79	26	50.25	0.7500	1.9327
27	1980	27	51.75	1.5000	1.9166
28	81	28	52.5	0.7500	1.875
29	82	29	53	0.5000	1.8276
30	83	30	53.75	0.7500	1.7917

TABLE

Range	Village	Area in Ha.	Diameter Class						Total
			5-10 cm	10-15 cm	15-20 cm	20-25 cm	25-30 cm	25>30 cm	
Jariya	Dolaicha	1.00	466	226	93	13	3	-	801
	Mahugaon	1.00	406	210	83	10	6	-	715
	Kathkunwan	1.00	400	200	73	6	-	-	679
	Lappa	1.00.	433	220	90	3	-	-	746
	Nagra	1.00	426	226	86	10	3	-	751
	Konhapa	1.00	420	233	96	6	3	-	758
	Kasira	1.00	430	223	100	13	6	-	772
	Masko	1.00	406	213	83	10	3	-	715
	Total:		3387	1751	704	71	24		5937

			cm	15cm	20cm	25cm	30cm	30cm	
1	2	3	4	5	6	7	8	9	10
Ranchi East	Heslatoli	1.00	416	216	86	6	-	-	724
	Horhap	1.00	400	233	83	10	3	-	729
	Haratu	1.00	426	226	90	13	-	-	755
	Paika	1.00	433	213	93	6	-	-	745
.	Jarga	1.00	406	223	86	10	3	3	731
	Baram	1.00	450	183	100	13	-	-	746
	Kochbong	1.00	383	250	73	6	-	-	712
	Obar	1.00	393	233	80	3	-	-	709
	Total:		3307	1777	691	67	6	3	5851
	Average of The Range		413	222	87	8	1	-	731

TABLE

Range	Village	Area in Ha.	Diameter Class						Total
			5-10 cm	10-15cm	15-20cm	20-25cm	25-30cm	> 30cm	
1	2	3	4	5	6	7	8	9	10
Ranchi East	Bagda	1.00	450	236	100	10	3	-	799
	Rarha	1.00	433	226	93	6	-	-	758
	Sutiambay	1.00	383	200	80	3	-	-	666
	Gagari	1.00	400	206	76	10	3	-	695
.	Palu	1.00	440	220	86	13	-	-	759
	Rudia	1.00	420	213	83	6	3	-	725
	Banlotwa	1.00	400	216	90	3	-	-	709
	Sadma	1.00	440	226	96	10	3	-	775
	Total:		3360	1743	704	61	12	-	5886
	Average of The Range		421	218	88	7	2	-	736

TABLE

Range	Village	Area in Ha.	Diameter Class						
			5-10 cm	10-15cm	15-20cm	20-25cm	25-30cm	> 30cm	Total
1	2	3	4	5	6	7	8	9	10
Tamar	Parasi	1.00	383	206	80	6	3	-	678
	Udaydih	1.00	426	226	90	10	6	-	758
	Jargo	1.00	433	240	96	13	3	-	785
	Kubasal	1.00	400	213	86	6	3	-	708
	Burhadih	1.00	390	220	73	10	3	-	696
	Sarjamdih	1.00	423	216	76	13	6	-	734
	Lupunghatu	1.00	440	246	100	10	3	-	799
	Jaranga	1.00	450	233	103	6	6	-	798
	Total:		3345	1-800	704	74	33	-	5956
	Average of The Range		418	225	88	9	4	-	744

TABLE

Range	Diameter Class							
	5-10 cm	10-15cm	15-20cm	20-25cm	25-30cm	> 30cm		
	Avg. No. of trees	Avg No. of trees	Avg. No. of trees	Avg. No. of trees	Avg. No. of trees	Avg. No. of trees		Avg. No. of trees
1. Bero	415.417	219.17	85.83	7.083	1.67			
2. Jariya	423.75	219.33	88.33	9.17	3.33			
3. Khunti	436.67	227.50	89.17	9.583	5.0			
4. Ranchi East	413.73	222.50	86.67	8.73	0.83			
5. Ranchi West	420.83	218.57	88.33	7.9	1.67			
6. Tamar	418.33	225.40	88.50	9.583	4.58			
	Total:	2528.00	1332.00	526	52	17		
Average of Division		421	222	87	9	3		

TABLE

Calculation of Yield: - This is calculated on the basis of growing stock /hect calculated on the basis of sample plots and then averaging this figure of all the six ranges. Since the area under I Improvement Working Circle is known, hence the “Growing Stock” of each range can be estimated as following —

1. For, Bero Range

1. For, Bero Range— Area of Improvement W.C x Av. Growing stock
 $5888.67 \times 36 = 211992.12$
2. For, Jariya Range 3. For, Khunti Range — $6263.14 \times 36.00 = 225473.04$
3. For, Khunti Range— $12065.9 \times 36.00 = 292561.20$
4. For, Ranchi East Range — $81267 \times 36.0 = 292561.20$
5. For, Ranchi West Range — $3687.3 \times 36.00 = 132742.80$
6. For, Tamar Range — $22950.5 \times 36.00 = 826218.00$



