TFDPCL MANUAL (STANDARD OPERATING PROCEDURES) FOR DIVISIONS

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Our Mission is to achieve the goals of responsible management of plantations

Through commitments to Forest Stewardship Council (FSC) standards of

Forest Management and Stump-to-Gate Chain-of-Custody Certification

A. Standard Operating Procedure (SOP) RUBBER SHEET

1. Background :

1.1 TRIPURA, the smallest state in the North Eastern region holds the 2nd highest population next only to Assam with population density of 263 per sq. Km. About 60% of the area of the State are hilly.

1.2 Out of the 10,491 sq. Km. Of geographical area, only 2,850.00 sq.km. (18% are tillable. _ 5% of the area are forests land and rest 15.5% are either un-available for land use, under marginal land use practices or under pupulation crops.

1.3 Tribal population in the State is **11,67,400** (2011 census), constituting about 31% of the total population. Very few of them are engaged in settled agriculture, more than 75% of the tillable land being out of their reach. This leaves them dependent on the hilly areas (locally called "*tilla*s") for pursuit of occupation for sustenance. The state of economy do not offer the village artisans scope to develop of sectoral entity.

1.4 Earlier State was proud of village artisans especially carpentry. But with the development of modern tools and Industry they could not compete with rest of India.

1.5 The State has a single corridor for having surface communication with the rest of the country, having about 840 km. of international border line with Bangladesh and connected with a stretch of only 162 Km. with the Territory of Indian Union most of which run along the hilly and rugged terrains away from the communications system of neighboring states.

1.6 Laden with economic backwardness and acute unemployment problems and living in isolation from the mainstream life, these tribal population are the target group of subversive and antisocial activities elements and are the breeding grounds for subversive and antisocial activities.

1.7 This serious Socio-economic situation demands immediate intervention through economic solution to maintain the federal fabric of the country.

1.8 Conservation of the ecology and environment in the state cannot be thought of without addressing the socio-economic problem of its people in the backdrop of present situation faced by the State.

2. History of Rubber Plantations

Natural rubber has been found in the latex of more than 2000 species of plants. Among them Hevea bresliensis (the rubber tree) is the most important commercial source of natural rubber. A native of the Amazon river basin of South America, it was introduced to Tropical Asia in 1876. Rubber is grown in India for 120 years and with over 533000 ha under rubber, India is fourth largest producer of Natural rubber in the world.

In Tripura, the Forest Department started organized planting of Rubber (Hevea brasillensis) in 1963 though the species was introduced in the early Fifties. Initially it was valued for its capacity for giving soil cover in soil conservation afforestation programme. Later its potential for producing latex was explored both qualitatively and quantitatively. It has been established that Rubber is commercially viable in Tripura and comparable to its performance in Kerala. Agro climatic suitability for planting Rubber in the state has been well established. Year wise Rubber plantation in different states is given in Annexure A. Rubber plantation raised in Tripura year wise given in Chart 1. As per the data available Tripura is the second largest in Rubber plantation.

Tripura Forest Development & Plantation Corporation Limited(TFDPC Ltd) was registered under Companies Act, 1956 on 26.3.1976. Raising of commercial plantation of rubber along with production of raw rubber produces.

- Value addition to rubber wood by way of treatment in Timber Treatment Plant.
- Value addition to raw rubber by way of producing Centrifuged latex. Crepe rubber etc.
- Resettlement of Schedule castes and Schedule Tribes families on rubber plantation based projects for their economic upliftment.

In addition, 418.66 ha. of rubber plantations originally raised by Forest Department during the period 1963 to 1975 are also under the Management of the Corporation. Corporation has been entrusted to raised Rubber Plantations on 1500 hectares of Degraded Forest land cleared by Ministry of Environment & Forest, Govt. of India, for the resettlement of *Jhumia* Tribal. Fund is provided by the Govt. of Tripura for implementation of this Project which took off in 1998-99. TTAADC and TRPC Ltd. is the other partner for implementation of this Project.

S.N	Name of Centre	Area(ha)	No of Tapping Blocks
Sadar Division, Agartala			
A.TFDPC Plantation			
1	Bankumari RPC	70	42
2	Kalamchoura RPC	347	128
3	Pathalia RPC	129.4	60
4	Anandapur RPC	114.3	69
5	Motinagar RPC	351.5	142
6	Sovapur RPC	41.5	20
7	Dhanpur RPC	46.9	24
8	Nirvoypur RPC	143.1	52
Sub Total		1243.70	537
B. Resettlement Plantation			
9	E. Karangicherra	315.5	nil
10	W. Karangicherra	207.55	nil
11	Banbazar RPC	65.35	nil
12	Vrigudasbari RPC	79.45	nil
13	Dhanyamanikya	98.25	nil
14	Chelikhola RPC	69.3	nil
15	Warangbari RPC	195.9	nil
Total		1031.30	
Sub Total of Total of Sadar division		**2275.0**	537.0
South Division_I, Santirbazar, South Tripura			
A.TFDPC Plantation			
1	Abhangcherra RPC	654	344
2	Sachirambari RPC	414.25	271
3	Debdaru RPC	58.95	32
4	Paikhola RPC	336.7	152
5	Chittamara RPC	186.4	81
6	U.B.C Nagar RPC	84	34
7	Ekinpur RPC	283.5	72
8	Kalshimukh RPC	118.43	50
9	Motai RPC	16.5	6
10	Batisha RPC	167	nil

11	Chottakhola RPC	73	nil
12	Haripur RPC	113	nil
13	Sonaichari RPC	53.4	nil
	Total	2559.13	1042
Sub Total Of South I division		**2559.13**	**1042**
South Division_II, Sabroom, South Tripura			
A.TFDPC Plantation			
1	West Ludhua RPC	403.49	172
2	Gorifa RPC	223.25	120
3	Amlighat RPC	30.5	24
	Baishnabpur RPC	189.5	57
Sub Total		846.74	373
B. Resettlement Plantation			
1	Gardang RPC	265	-
2	Kathalchari RPC	122	104
3	Chalitachari RPC	79.5	-
4	North Bijoypur R	90	32
5	South Bijoypur	174	99
6	Chatakchari RPC	56	-
7	Betaga RPC	77	-
Sub Total		863.50	235
Sub Total Of South II division		**1710.24**	**608**
Factory Division,Takmacherra,South Tripura			
A.TFDPC Plantation			
1	Patichari RPC	94.35	52
2	Central neursry	8.8	8
3	Takmacherra	389.23	176
Sub Total of Factory division		**483.58**	**236**
North Division, Kumarghat, Unakoti & North Tripura			
A.TFDPC Plantation			
1	Bilthai RPC	81	40
2	Sailenbari RPC	153.2	64
3	Panitilla RPC	340.15	86
4	Jouri RPC	295.25	77
5	Rowa RPC	144.5	139
6	Ratacherra RPC	208.5	86
7	Nalkata RPC	73.25	22
8	N.C. Para RPC	191.25	46
9	Golakpur RPC	139.9	-
10	Amarendranagar RPC	207.2	55
11	Saiderpar RPC	120.39	52
Sub Total		1844.59	667
B. Resettlement Plantation			
1	Bagaicherra	31.5	10
2	Nalkata RPC	15	15
3	Bilthai RPC	29	12
4	Pekucherra RPC	114.52	66
5	Indurail (Rowa RPC)	5.4	2.5

6	Peracherra	30	-
Sub Total		225.42	105.5
Sub Total of North division		**2070.01**	**772.5**
Grand Total		**9097.96**	**3195.5**

2.1.

Rubber plantation for Tribal Welfare

The State Govt. has been attaching priority to the rubber plantation with the objective of rehabilitating Rural Tribal and other weaker sections to provide them with permanent source of Income to raise them above poverty line. Different agencies including NGO are involved in uplifting the tribal economy through Rubber plantation. TFDPC Ltd. has also raised rubber plantation for the benefit of tribal.

. **Rubber plantation; Details of Rubber plantation already mentioned in part .**
Rubber plantation Division wise is as follows.

3. HARVESTING

Once the rubber tree attains harvestable age i.e. 7 to 8 years; girth dimension 50cm, it is ready for tapping

3.1Tapping

Latex is obtained from the bark of the rubber tree by tapping. Tapping is a process of controlled wounding during which thin shavings of bark are removed. The aim of tapping is to cut open the latex vessels in the case of trees tapped for the first time or to remove the coagulum which blocks the cut end of the latex vessels in the case of trees under regular tapping.

3.1.2 Standard of tappability and height of opening:

Budded plants are tapable when they attain a girth of 50 cm at a height of 125 cm from the bud union. Virgin panels and renewed panels are opened at the same height i.e., 125 cm. It will be generally economic to begin tapping when 70% of the trees in the selected area attain the standard girth. In the traditional rubber growing region it takes an average of seven years to reach this state whereas it is nine or ten years in non-traditional regions. Planting advanced materials like polybag plants, selecting and planting vigorous material help to reduce the immaturity period.

In India, the best period to open new areas for tapping is March-April. The trees left behind during the season due to want of sufficient girth may be opened in September. In the immature phase annual growth rate is around 7cm, whereas it will be 2cm or less under tapping. Hence, threes of lower girth than recommended should not be opened for tapping.

3.1.3 Marking, slope and direction of tapping cut

The tapping cut of budded trees should have aslope of about 30° to horizontal. For seedling trees, the cut need to have a slope of only about 25°, since the bark is fairly thick. A very steep cut leads to wastage of bark when tapping reaches the base of the tree and too flat a cut leads to overflow to latex. The slope should be marked, preferably annually, using appropriate template. The latex vessels in the bark run at an angle of 3-5° to the right and therefore a cut from high left to low right will open more latex vessels. To avoid spillage, and inward slope towards wood has to be maintained on the tapping cut. In general, tapping on the basal panel in on half circumference (S/2) of the tree. It is desirable to divide the circumference into two equal halves in the first year of marking itself to ensure exactly half circumference tapping throughout the harvesting period.

3.1.4 Latex

Hevea latex in the latex vessels of tapped trees contains 30-45% rubber in the form of particles. Latex is a hydrosol in which the dispersed particles are protected by a complex film. It contains more than one disperse phase. Besides rubber, the latex contains certain other particles also, namely lutoids and Frey Wyssling particles. Lutoids are associated with the process of latex vessel plugging which stops the flow of latex a few hours after tapping. Displacement area of latex is generally limited to an average of 70 cm towards the bottom, 40cm to the upper side and 5 cm to either side of the tapping cut. The amount of latex exuded during a tapping need to be regenerated within the bark itself before the next tapping, and the time required is more than 48 hours in case of high yielding clones like RRII 105.

When the tree is tapped and the vessel is cut the pressure at the location of the cut is released and viscous latex exudes. The exudation of latex results in the displacement of latex along the length of the latex vessel and laterally owing to strong forces of cohesion existing in the liquid phase. This results in a fall in pressure in the vessels leading to entry of water from surrounding tissues making the latex more dilute. Dilution makes the latex less viscous. Subsequent disturbances in the osmotic concentration in vessel damages lutoids. Damage of lutoids releases a protein named ‘hevein’ which forms cross link between rubber particles resulting in coagulation of latex at the cut ends of vessels. This leads to plugging of the vessels and cessation of latex flow. Hevein binding is most efficient in acidic pH.

Tapping depth, bark consumption and bark renewal

The best yield is obtained by tapping to a depth of less than one millimeter close to the cambium since more latex vessels are concentrated near the cambium. Shallow tapping results in considerable loss of crop. To obtain optimum yield, care should be taken not to injure the cambium at the time of tapping. However, minor tapping wounds which will heal

in due course need not be considered serious, in the case of medium and low yielding clones.

To restart flow from a tapping cut on a subsequent tapping, all that is needed is to cut and remove a thin shaving of the bark (thickness of shaving should vary based on the tapping frequency adopted) along with which the plugs of coagulated latex are also removed. Latex flow ceases when latex gets coagulated, clogging the cut ends of the vessels with minute plugs of coagulated latex. While fixing spout, care should be taken to fix it at half way mark of annual bark consumption (for effective protection of the cup by rainguard during monsoon).

Bark regeneration is brought about by the activity of the cambium. The rate and extent of renewal are dependent on the genetic characters of the plant, fertility of the soil, climatic conditions, quality of tapping, tapping system, frequency and intensity, planting density and disease incidence. It is desirable to start tapping on renewed panel at least after 10 years of opening.

3.1.5 Time of tapping, task and utensils

It is necessary to commence tapping early in the morning as late tapping reduces the exudation of latex. If used properly, the 'Michie Golledge' knife used in our country is well adopted for a high standard of tapping with minimum bark consumption. The draw knife or 'Jebong' knife common in Malaysia is suitable for both high and low level tapping, and bigger task, and is now becoming popular in this country. Jorwin or Manimooli knife can be used more effectively in places where Michie knife is being used. Unlike Michie, tapper need not turn or knife need not be turned to tap front and back end of the cut. The knives should be sharp. The knives, cups, buckets, etc. should be cleaned well to prevent bacterial contamination and spoilage of latex. The tapping task (number of trees tapped on a day by one tapper) in India is around 300-400 trees compared to 400 to 500 trees in other countries.

3.1.6 Tapping systems

Response to different tapping systems varies from clone to clone. Since majority of rubber area is with high yielding clones, in general rubber trees are to be tapped on half spiral third daily (S/2 d3) system. Alternate daily tapping can be practiced for medium yielding clones (RRIM 600, GT 1, PB 28/59 etc.). For high yielding clones like RRII 105, PB 217, PB 260 etc., low frequency tapping systems with appropriated yield stimulation may be practiced. However, low frequency tapping can be adopted for medium yielding clones also.

3.1.7 Rainguarding

During rainy season tapping can be carried out by fixing a rainguard above the tapping cut.

Thus by preventing loss of tapping days due to rain, regular tapping can be ensured by rainguarding under any given tapping frequency. Chances of bark rot are high when the trees are rainguarded and tapping is continued during rainy season. Irrespective of the type of rainguard used, regular panel washing using panel protectant (Indifil/Dithane M45, 5g/litre) at 10-15 days interval is necessary to prevent incidence of panel diseases.

3.1.8 Tapping rest

In south India, rubber trees shed leaves during December to February and refoliate soon along with production of flowers. During refoliation and flowering, the yield will be comparatively poor and normally trees are given about 3-4 weeks rest during this stage if the soil is very dry and yield is uneconomic. For CUT with ¼ spiral cut and for d4 and d6 frequencies of tapping, rest may be avoided.

4. PROCESSING OF THE CROP

The main crop from the rubber tree is latex, a milky dispersion of rubber in water, which is harvested by tapping. The latex that flows out is channeled into an attacked container. Coconut shells and polythene cups are `commonly used as container in rubber holdings in India. Latex collected in the cups is transferred to clean buckets, two or three hours after tapping. Around eighty percent of the crop from plantation is in the form of latex. The latex which gets dried up on the tapping panel (tree lace) and the collection cups (shell scrap) also form part of the crop and are collected by the tapper in a basket just before tapping. The latex spilt and / or overflowed on the ground, when gets dried up, is also collected as scrap (earth scrap) once in a month or so. Normally, 15 to 25% of the total crop constitute tree lace, shell scrap and earth scrap together called field coagulum rubbers.

The different forms of crop are highly susceptible to degradation due to bacterial contamination on keeping. Therefore it is essential to process them into forms that allow sage storage and marketing.

4.1 MARKETABLE FORMS OF NATURAL RUBBER

The important forms, in which the crop can be processed and marketed are (1) sheet rubbers, (2) crepe rubbers, (3) preserved field latex and latex concentrates, and (4) block rubber. The crop collected in the form of latex can be processed into any of the above forms. But the crop collected as field coagulum can be processed only into crepe or block rubber.

Fresh latex, as it comes out from the tree is slightly alkaline or neutral. It becomes acidic rapidly due to bacterial action. The formation of organic acids neutralizes the negative charge on rubber particles and the latex gradually thickness and gets coagulated on keeping. Therefore, fresh latex cannot be kept for long without coagulation.

4.2 Anticoagulants

An anticoagulant is a chemical added to latex to prevent pre-coagulation before it is processed. Anticoagulants generally used are ammonia, sodium sulphite and formalin. Of these, ammonia is recommended, when the latex is to be processed as preserved latex or latex concentrates. For sheet processing anticoagulants are used only if essential and sodium sulphite is preferred.

5. SHEET RUBBER

Latex is coagulated in suitable containers into thin slabs of coagulum and sheeted through a set of smooth rollers followed by a grooved set, and dried to obtain sheet rubber. Depending upon the drying method, sheet rubbers are classified into two; ribbed smoked sheets and air dried sheets (pale amber unsmoked sheets). A major quantity of rubber in India (about 73%) is marketed in the sheet form at present, as it is the oldest and the simplest method of processing latex into a marketable form.

For processing into sheet rubber, the latex collected is brought to the processing factory before pre-coagulation sets in. In cases where the latex is prone to pre-coagulation and anticoagulant is used. A few drops of the anticoagulant are added to collection cups at the time of tapping, if necessary. The rest of the required quantity is added into the collection buckets when they are half full. Anticoagulants should not be poured into empty collection buckets.

Latex brought to the factory is strained through 40 and 60 mesh stainless steel sieves. The volume of latex is measured with a standard vessel and calibrated rod. The dry rubber content (drc) is estimated with a metrolac which is a special type of hydrometer calibrated to read drc directly. The drc thus obtained is only approximate and for accurate determination, laboratory methods are employed

5.1Dilution

Latex is diluted in bulking tanks to a standard consistency of ½ kg of dry rubber for every 4 litres of diluted latex (12.5% drc). The diluted latex is allowed to stand in the bulking tank for a fixed time (usually 15 to 20 minutes) to sediment the heavy dirt particles.

6. **COAGULATION**

Formic acid or acetic acid is generally used for coagulation. The quantity of acid required for satisfactory coagulation depends on various factors like the amount and type of anti coagulant used, the duration of coagulation, the season and the nature of the latex.

7. **SMOKING**

The sheets after four to six hours of dripping in shade are put in the smoke house where the temperature is maintained between 40º and 60ºC. In the smoke house sheets are dried

gradually whereby blisters are avoided. In addition, the creosotic substances present in the smoke prevent mould and yeast growth on sheets.

It is preferable to smoke the sheets on the first day at a low temperature (40º to 43ºC). For the subsequent days (i.e. second to fourth day) the sheets are to be dried at a higher temperature (not exceeding 60ºC) and fairly low relative humidity. For this the smoke house has two chambers where precise control of temperature and humidity is possible. However, in the absence of two smoke chambers, the sheets can be dried in a single chamber by placing the sheets on the reapers at the bottom region on the first day and at the top regions on subsequent days of smoking.

There are various types of smoke houses, all working on the same general principle. The essential features of a smoke house are a chamber in which the sheets can be placed on reapers, a furnace outside the chamber and as flue duct connecting them. The sheets are to be turned on the reapers every day for uniform smoking and drying and to avoid reaper marks. Four days of smoking is generally sufficient under normal conditions, but during the rainy season five to six days are required for satisfactory drying.

8. GRADING

The completely dried sheets are removed to the packing shed where they are carefully inspected and graded according to the standards as per IS 15361-2003. This standard provides for six grades of ribbed smoked sheets, viz. RSS 1X, RSS 1, RSS 2, RSS 3, RSS 4 and RSS 5.

9. PACKING

The sheets after grading are packed in bales of 50 kg.

B. 10 SOP FOR PRODUCTION OF CENEX

Ammoniated Field latex (about 1% concentration) collected from the field on reaching to Latex Centrifuging Factory are stored in Latex Reception Tank. Following test of the raw latex is done before feeding to the Centrifuging machine:

1. Dry Rubber Content (DRC)
2. Volatile Fatty Acid (VFA) content
3. Magnesium content
4. Ammonia content.

- The value of DRC is used to know size of skim screw to be used in the Centrifuging machine to have optimum output from the machine.
- Value of VFA although desired to be as low as possible, but once it is developed in the latex, it cannot be reduced. Thus, blending of latex of various tanks is done to have VFA at low level.

- In order to remove sludge from ammoniated latex, 5 times weight of Mg, Diammonium Hydrogen Phosphate (DAHP) on dissolving in ammoniated water is mixed with the ammoniated latex and after stirring well, the latex is left under disturbed for about 12-16 hours.
- In order to have 1% concentration of ammonia in the latex, ammonia gas is added to the latex containing DAHP.

Prior to feeding of latex to Centrifuging machine, length of Feed tube and size of skim screw to be fitted in the Centrifuging machine are ascertained based on DRC of latex to be fed. After fitting of feed tube of required length and skim screw of proper size in the Centrifuging machine, the above latex is fed to the Centrifuging machine. Concentrated latex coming out from the machine is collected in storage tank while skim is taken through chute to tank located in distant place so as allow ammonia gas to get escaped while flowing which allows use of less acid for coagulation of skim.

Concentrated latex taken in the storage tank is further tested in the laboratory to ascertain its DRC and ammonia content. To maintain DRC at 60%, ammoniated water is mixed and to maintain ammonia at 1%, ammonia gas is mixed.

In order to boost up Mechanical Stability of the concentrated latex, Lauric Acid is added. Requirement of Lauric Acid is 0.01-0.05% on weight of concentrated latex. The required quantity of Lauric acid is first melted and added with ammoniated water and mixed with the concentrated latex. On addition of Lauric Acid, the concentrated latex is kept in the storage tank for 20 days. Thereafter, sample is taken to laboratory and tested for the following parameters as per ISI specification (IS: 5430).

S. N.	Parameter	Type-HA	Type MA	Type LA
1	Total Solid content min%	61.5	61.5	61.5
2	DRC Min%	60	60	60
3	Non Rubber Solids min%	2	2	2
4	Alkalinity as NH_3	Minimum 0.6 %	>0.3 %<0.6%	Max.0.3 %
5	Mechanical stability in sec	475	475	475
6	Coagulum content max	0.05 % on	0.05 % on	0.05% on latex

		late x	late x	
7	Copper content on total solid. Max ppm	8	8	8
8	Mn content Max ppm	8	8	8
9	Sludge content max%	0.10	0.10	0.10
10	VFA number Max	0.15	0.15	0.15
11	KOH no. Max	1.0	1.0	1.0
12	Colour on visual inspection	Should not have pronounced blue or grey colour		
13	Odour after neutralisation with Boric acid	Should not have pronounced odour of putrification after neutralisation with Boric acid.		

Once the sample gives above result, the concentrated latex commercially known as Cenex is packed in 210 litre capacity MS barrel specially prepared by providing coat of Bituminous paint in the interior surface of the barrel.

Skim coming from the Centrifuging machine is coagulated using diluted Sulphuric acid and processed in the Crepe Mill to produce Skim Crepe. Dried Skim Crepe is made in to bundle having weight of 25 kg each.

11. SAFETY MEASURES TO BE TAKEN WHILE RUNNING CENTRIFUGING FACTORY

1. Latex carrying tank, reception tank and storage tanks are to be regularly cleaned using Formaline solution.
2. At least once in a year, interior surface of such tanks are to be provided with a coat of bituminous paint and wax.
3. Ammoniation to latex should be done immediately of its collection.
4. Raw latex should not be processed within 12 hours of addition of DAHP
5. Sludge of reception tanks should be daily removed before receiving fresh latex
6. Feed tube of proper length and skim screw of appropriate size should be used to have maximum out of the Centrifuging Machine.
7. Cenex should not be packed before 20 days of mixing of Lauric Acid.

8. MS barrel prior to filling with Cenex should be provided with Bituminous paint in the interior surface.

12 SAFETY MEASURES TO BE TAKEN

1. Ammonia Storage Shed containing Ammonia cylinder should have adequate facility for spraying of water to absorb ammonia Gas while leaks.
2. Bowl of Centrifuging machine should be properly fitted prior to switching on the machine.
3. Direction of rotation of motor of Centrifuging machine should be properly adjusted both for Electricity provided by TSECL and electricity produced by Generator as due to changes of Phase during supply of electricity by TSECL, motor may rotate in reverse direction leading damage to the machine.
4. Hand gloves should be put on by each worker.

In case of leakage of Ammonia, sufficient water has to be sprayed

13. FELLING AND LOGGING

General clone of rubber has productive age of 30 years. After its productive age slaughter tapping is done for few years. The rubber trees are either unable to give latex or latex collection is not commercially viable. In such situation trees are felled and site is made ready for replanting. Tree after felling and logging sent to timber treatment plant for treatment. Depending upon year of plantation, TFDPC Ltd has prepared extraction plan enclosed as annexure.

C.13.1 Standing operating Procedure (SOP) for felling of trees and conversion of logs

(a) Equipments Used:
a.Felling axe\
b. 'Dao'
c. Cross cut saws
d. Hand saw
e. Wedges.
f. Measuring tape.
g. Rope

(b) Tree felling Procedures:

- Tree should be felled as near the ground as possible. Generally felled area is used for replanting so the tree should be felled as near the

ground as possible. This will help in more output of timber also. The height of the tree in no case more than 15-30 cm.

- Tree should be felled in a manner and in the direction in which they will do least damage to themselves and surrounding area.
- The first determining factor in felling is direction of fall. The direction of fall should be parallel to path of transportation, not perpendicular to it. After determining the direction butt end of the stem should be rounded off with an axe and the stem with thick bark should be debarked. Generally due to tapping there is no bark. Then only with axe it should be clearly rounded off. On the side of direction of felling, a notch or undercut is chopped. This has a level base and a straight inner line which is called a tipping edge. The notch makes it possible for the trees to fall over the tipping edge and breaks it from the stump. The notch is cut about 2/3 rd of the diameter of the trees. The position of the cut is marked on the stem, and then horizontal and sloping cuts are notched with the help of an axe. The next cut is made exactly opposite to this cut and about 10-15 cm above it. Both the cuts must be parallel to each, otherwise the tree will deviate from the desired direction of fall. In case of felling by saw cut is made and the tree is tipped by continuous driving of wedges. After the tree felling logging is done in required size. The cut end of round log is immediately applied Borax to protect from fungus attack.
- Tree should not be felled across others lying on ground.
- On hilly ground the tree should be felled uphill, as in this direction they have the smallest angle to fall through and they will fall parallel with the lie of the ground.
- Tree should not be felled during a strong wind, when it is not possible to ensure the fall of trees in the desired direction. And the work itself is exceedingly difficult and dangerous.
- Felling should usually begin at the top of the slope and proceed in a downhill direction.
- Felling should be concentrated as much as possible. The felling should be carried in a controlled manner and kept under supervision.

14. HEALTH AND SAFETY MEASURES

The following safety measures are taken/provided for the Tappers & processing of different RPCs under TFDPC

- Hunting shoes & woolen jerseys are provided to tappers at every 2 year interval.
- Gum boot/apron/musk is provided to processing workers with replacement as and when required.
- First Aid Box with primary medicines/equipments kept at each RPC with a provision for replacement before expiry date.
- Rest sheds are made nearby tapping blocks for shelter of tappers during rains.
- Tapping blocks are regularly maintained (at least twice in a year) along with base line cleaning during winter to avoid fire hazards with stacking of fire extinguishing materials.
- Approach path/foot path/steps to each tapping block also made/maintained every year to avoid injury to tappers in course of harvesting field latex.
- During peak season helpers are provided for carrying excess latex beyond task.
- Although formal medical/health camp not organized at each RPC but tappers are motivated to attend health camp organized by civil administration at nearby place.
- Chemicals/insecticides/fungicides are kept carefully at each RPC.
- Important Telephone Numbers e.g. Police Station, Fire Service, Hospital, Ambulance have been displayed in the noticed board of RPC.
- Arrangement kept for drinking water at each RPC for tappers and workers.
- Extension of facility for recreation an entertainment e.g. provision for carom board and volley ball etc.
- Other Amenities provided to the tappers/workers of TFDPC
- Safety measures for felling of trees and conversion into logs is generally (i) Physical demarcation of area (ii) Placing precautionary sign boards. (iii) Use of safety gadgets like helmets by worker etc.
- Reimbursements of medical bills of workers are done by Corporation.

15. TRAINING

TFDPC initially after its establishment engaged Tapping cum supervisor for imparting training in tapping and processing of field latex and processing into rubber sheet. Subsequently Tappers training centre was established at Sovapur under Sonamura sub division of Sepahijalla district. The tappers (local workers) were also sent to rubber board for training. At present there is large number of resource persons

available for imparting training to tappers. Training is provided to new tappers and processing workers prior to their engagements.

15.1 Schedule of Training for Tappers & Processing workers

Normally tapper & processing workers trainings are imparted simultaneously to the new/substitute tappers by master trainer/trained staff at each RPC during the lean period from April to August when new tapping blocks are opened. But the objectives are different for tapper & Processing workers. In addition refresher training to the existing tappers is also conducted for their skill up gradation with new techniques and tapping knives launched by rubber board. Usually 10 persons are taken for tapper training at a time for better practical demonstration.

Duration:-Normally 10 days for new tappers/workers

Location:-Traditionally in the respective RPC.

Allowances:-Usually Tiffin allowances are provided @ Rs. 100/- per day.

Period/season:- Preferably during lean seasons April to August.

Objectives of Tappers Training:-To make the tapper well conversant with the following aspects of rubber trees brought under tapping block of RPCs and part of processing of field latex upto coagulation.

- Numbering of tapping blocks/Marking of channels with template/showing ABCD panels/Fixing of hanger/Cup/spout/cutting of channel with tapping knife (both ordinary and jobong knife)/Accurate angle/degree of channel/Method/system of tapping i.e. S/2D2,S/2D3/Scientific technique/Time of tapping during summer and during winter/Cleanliness of latex collecting cups & tins to reduce contents of VFA (specially for re-settlement RPCs from where field latex are transported directly to factory)/Treatment of injury to rubber trees by application of rubber coat/Safety measures required to be taken during tapping/Ratio of Formic acid & Field latex for coagulation according to DRC/Sieving of field latex before coagulation/Alignment of Aluminum Trays kept for coagulation after removing foams./Tips on health & physical fitness.

  Objectives of Trainings for Processing Workers:- To make processing worker well trained and familiar with different steps of rubber processing as noted below:-

- To train in handling sheet rolling machines (both hand rolling & battery sheeting machine).
- To upgrade skill to process quality rubber sheets by proper sun drying & smoke drying.
- To make understand the common defects noticed in smoked dryed sheets e.g. sheet containing dirt etc. small bubbles, clusters of bubbles, white pots, blisters, burnt stoats, thin & weak sheets, mould or fungal spots, rusting, stickiness etc. and the preventive measures to be taken to produce quality sheets.
- To give knowledge regarding grading of sheets, mainly RSS-4 and RSS-5.
- To make well trained in packing & baling of smoke dried rubber sheets after necessary grading.
- Marking of each Bale with RPC –Code & rubber Grade.

15.2 Details of Training for Plantation, Rubber Processing

Tappers' Training under TFDPC Ltd.

Name of the Division	Name of RPC	Year	Type of training		Duration of training (Days)	Period of training	Training provider	No. of tapper trained (No.)
			Processing/ Plantation / Both	Field / classroom				
South-II Division, Sabroom	West Ludhua	2011-12	Processing/ Plantation / Both	Field / classroom	15	01.04.11 To 15.04.11	Anthony Thomus TCPS	10
	Gorifa	2011-12	NIL	NIL	NIL	NIL	NIL	NIL
	Baishnabpur	2011-12	Processing/ Plantation / Both	Field / classroom	15	02.7.121To 16.07.11	Mridul Shil	5
	Amlighat	2011-12	DO	DO	10	16.04.11 To 25.04.11	H.Debnath, Cfr.	3
	West Ludhua	2012-13	Do	DO	15	1.04.12 To 15.04.12	Anthony Thomus TCPS	9
	Gorifa	2012-13	DO	DO	10	1.08.12 To 10.08.12	Sunil Datta, TCPS	10

	Baishnabpur	**2012-13**	**DO**	**DO**	**15**	**1.04.12 To 15.04.12**	**Mridul Shil**	**5**
	Amlighat	**2012-13**	**NIL**	**NIL**	**NIL**	**NIL**	**NIL**	**NIL**
	West Ludhua	**2013-14**	**Processing/ Plantation / Both**	**Field / classroom**	**10**	**17.04.13 To 26.04.13**	**Kartik Bhowmik, P.G**	**12**
	Gorifa	**2013-14**	**DO**	**DO**	**10**	**16.10.13 to 25.10.13**	**Dhananjoy Debnath, MCW**	**10**
	Baishnabpur	**2013-14**	**DO**	**DO**	**NIL**	**NIL**	**NIL**	**NIL**
	Amlighat	**2013-14**	**NIL**	**NIL**	**NIL**	**NIL**	**NIL**	**NIL**
Sadar Division	**Motinagar**	**2000-2001**	**Plantation (Tapping)**	**Field / classroom**	**30**	**15.05.2000 to 14.06.2000**	**Parameshwaran, A.A. Keralian, TCPS, under Sovapur Tappers Training School.**	**20**
	Kalmchoura		**DO**	**DO**	**30**	**01.07.2000 to 31.07.2000**	**DO**	**20**
	Nirvoypur		**DO**	**DO**	**30**	**10.08.2000 to 08.09.2000**	**DO**	**21**
	Anandapur		**DO**	**DO**	**30**	**15.09.2000 to 14.10.2000**	**DO**	**21**
	Dhanpur		**DO**	**DO**	**30**	**18.10.2000 to 16.11.2000**	**DO**	**19**
	Sovapur		**DO**	**DO**	**30**	**20.11.2000 to 19.12.2000**	**DO**	**19**
	Bankumari		**DO**	**DO**	**30**	**20.12.2000 to 18.01.2001**	**DO**	**14**
	Motinagar		**DO**	**DO**	**30**	**20.01.2001 to 18.02.2001**	**DO**	**19**
	Kalmchoura		**DO**	**DO**	**30**	**05.03.2001 to 31.03.2001**	**DO**	**20**
	Kalmchoura	**2001-02**	**DO**	**DO**	**30**	**06.04.2001 to 05.05.2001**	**DO**	**18**
	Nirvoypur		**DO**	**DO**	**30**	**06.05.2001 to 07.06.2001**	**DO**	**20**
	Anandapur		**DO**	**DO**	**30**	**11.06.2001 to 10.07.2001**	**DO**	**20**
	Dhanpur		**DO**	**DO**	**30**	**13.07.2001 to 11.08.2001**	**DO**	**20**
	Sovapur		**DO**	**DO**	**30**	**16.08.2001 to 14.09.2001**	**DO**	**14**
	Bankumari		**DO**	**DO**	**30**	**19.09.2001 to 18.10.2001**	**DO**	**19**
	Motinagar		**DO**	**DO**	**30**	**16.11.2001 to 15.12.2001**	**DO**	**19**
	Kalmchoura		**DO**	**DO**	**30**	**18.12.2001 to 16.01.2001**	**DO**	**20**
	Motinagar		**DO**	**DO**	**30**	**21.01.2002 to 19.02.2002**		**18**
	Bankumari		**DO**	**DO**	**30**	**25.02.2002 to 26.03.2002**		**19**
	Kalmchoura	**2002-03**	**DO**	**DO**	**30**	**27.03.2002 to 25.04.2002**	**DO**	**20**

	Kalmchoura		**DO**	**DO**	**30**	**29.04.2002 to 28.05.2002**	**DO**	**19**
	Nirvoypur		**DO**	**DO**	**30**	**29.05.2002 to 28.06.2002**	**DO**	**19**
	Anandapur		**DO**	**DO**	**30**	**18.07.2002 to 16.08.2002**	**DO**	**22**
	Dhanpur		**DO**	**DO**	**30**	**19.08.2002 to 17.09.2002**	**DO**	**20**
	Sovapur		**DO**	**DO**	**30**	**20.09.2002 to 09.10.2002**	**DO**	**20**
	Bankumari		**DO**	**DO**	**30**	**23.10.2002 to 21.11.2002**	**DO**	**20**
	Motinagar		**DO**	**DO**	**30**	**26.11.2002 to 25.12.2002**	**DO**	**22**
	Kalmchoura		**DO**	**DO**	**30**	**27.12.2002 to 25.01.2003**	**DO**	**21**
	Kalmchoura	**2003-04**	**DO**	**DO**	**30**	**05.03.2003 to 03.04.2003**	**DO**	**15**
	Motinagar		**DO**	**DO**	**30**	**07.04.2003 to 06.05.2003**	**DO**	**23**
	Kalmchoura		**DO**	**DO**	**30**	**07.05.2003 to 05.06.2003**	**DO**	**10**
	Nirvoypur		**DO**	**DO**	**30**	**09.06.2003 to 08.07.2003**	**DO**	**06**
	Anandapur		**DO**	**DO**	**30**	**09.07.2003 to 07.08.2003**	**DO**	**27**
	Dhanpur		**DO**	**DO**	**30**	**11.09.2003 to 30.09.2003**	**DO**	**9**
	Sovapur		**DO**	**DO**	**30**	**13.10.2003 to 11.11.2003**	**DO**	**20**
	Bankumari		**DO**	**DO**	**30**	**14.11.2003 to 13.12.2003**	**DO**	**15**
	Motinagar		**DO**	**DO**	**30**	**15.12.2003 to 13.01.2004**	**DO**	**20**
	Kalmchoura		**DO**	**DO**	**30**	**19.01.2004 to 17.02.2004**	**DO**	**20**
	Motinagar		**DO**	**DO**	**30**	**19.02.2004 to 19.03.2004**	**DO**	**10**
	Kalmchoura		**DO**	**DO**	**30**	**22.03.2004 to 20.04.2004**	**DO**	**20**
	Nirvoypur	**2004-05**	**DO**	**DO**	**30**	**27.04.2004 to 26.05.2004**	**DO**	**15**
	Anandapur		**DO**	**DO**	**30**	**28.05.2004 to 26.06.2004**	**DO**	**20**
	Dhanpur		**DO**	**DO**	**30**	**28.06.2004 to 26.07.2004**	**DO**	**20**
	Sovapur		**DO**	**DO**	**30**	**28.07.2004 to 26.08.2004**	**DO**	**16**
	Bankumari		**DO**	**DO**	**30**	**27.08.2004 to 26.09.2004**	**DO**	**21**
	Motinagar		**DO**	**DO**	**30**	**27.09.2004 to 19.10.2004**	**DO**	**16**
	Kalmchoura		**DO**	**DO**	**30**	**29.10.2004 to 27.11.2004**	**DO**	**17**
	Motinagar		**DO**	**DO**	**30**	**06.12.2004 to**	**DO**	**16**

						04.01.2005		
	Kalmchoura		DO	DO	30	17.01.2005 to 15.02.2005	DO	13
	Nirvoypur	2005-06	DO	DO	30	10.05.2005 to 08.06.2005	DO	20
	Anandapur		DO	DO	30	10.06.2005 to 09.07.2005	DO	16
	Dhanpur		DO	DO	30	11.07.2005 to 09.08.2005	DO	15
	Sovapur		DO	DO	30	11.08.2005 to 09.09.2005	DO	18
	Bankumari		DO	DO	30	20.10.2005 to 18.11.2005	DO	21
	Motinagar		DO	DO	30	20.11.2005 to 19.12.2005	DO	21
	Kalmchoura		DO	DO	30	22.12.2005 to 20.01.2006	DO	15
	Motinagar		DO	DO	30	22.01.2006 to 20.02.2006	DO	16
	Kalmchoura		DO	DO	30	22.02.2006 to 23.03.2006	DO	17
	Nirvoypur		DO	DO	30	27.03.2006 to 25.04.2006	DO	12
	Anandapur	2006-07	DO	DO	30	28.04.2006 to 27.05.2006	DO	17
	Dhanpur		DO	DO	30	29.05.2006 to 27.06.2006	DO	17
	Sovapur		DO	DO	30	05.07.2006 to 03.08.2006	DO	23
	Bankumari		DO	DO	30	07.08.2006 to 05.09.2006	DO	10
	Motinagar	2005-06	Budgrafting		15	15.06.2006 to 30.06.2006	DO	06
South-I, Division	Chittamara	2003-04	Processing/ Plantation	Field	10	13.01.2004 to 28.01.2004	Parameshwaran, A.A Tapping Demonstrator	3
	UBC Nagar		DO	DO	10	01.02.2004 to 09.02.2004	DO	2
	Paikhola	2005-06	DO	DO	10	05.05.2005 to 14.05.2005	DO	5
	Sachirambari		DO	DO	10	24.07.2005 to 29.07.2005	DO	5
	Chittamara		DO	DO	10	05.09.2005 to 15.09.2005	DO	10
	Ekinpur		DO	DO	10	20.10.2005 to 29.10.2005	DO	3
	Sachirambari	2006-07	DO	DO	10	17.05.2007 to 26.05.2007	DO	12
	Abhangcherra		DO	DO	10	28.05.2007 to 06.06.2007	DO	16
	Ratacherra	2013-14	Plantation (Tapping)	Field / classroom	30	2013-14	Senior tapper	3
	Saidarpar	2013-14	DO	DO	10	2013-14	-do-	7
	Sailenbari	2013-14	DO	DO	30	2013-14	-do-	3

North Division	Panitilla	2012-13	DO	DO	15	2012-13	-do-	8.
	Saidarpar	2012-13	DO	DO	7	2012-13	-do-	5
	Saidarpar	2011-12	DO	DO	10	2011-12	-do-	5
	Amarendra	2011-12	DO	DO	7	2011-12	-do-	11
	Panitilla	2011-12	DO	DO	14	2011-12	-do-	20
	Sailenbari	2009-10	DO	DO	30	2009-10	-do-	3
	N.C.para	2009-10	DO	DO	15	2009-10	-do-	7
	Panitilla	2009-10	DO	DO	30	2009-10	-do-	7
	Saidarpar	2009-10	DO	DO	15	2009-10	-do-	4
	Amarendra	2009-10	DO	DO	10	2009-10	-do-	12
	Golakpur	2008-09	DO	DO	30	2008-09	-do-	2
	Panitilla	2008-09	DO	DO	25	2008-09	-do-	7
	Sailenbari	2008-09	DO	DO	30	2008-09	-do-	4
	Juri	1997-98	DO	DO	37	1997-98	Tapper Training School at Juri	7
	Bilthai	1997-98	DO	DO	37	1997-98	-do-	4
	Panitilla	1997-98	DO	DO	30	1997-98	Senior tapper	10
	Rowa	1997-98	DO	DO	15	1997-98	-do-	12
	N.C.Para	1997-98	DO	DO	34	1997-98	-do-	10
	Amarendra	1997-98	DO	DO	11	1997-98	T.T.School	10
	Saidarpar	1997-98	DO	DO	11	1997-98	-do-	5
	Sailenbari	1996-97	DO	DO	31	1996-97	Senior tapper	12
	Rowa	1996-97	DO	DO	30	1996-97	TCPS	10
	Golakpur	1996-97	DO	DO	88	1996-97	T.T.School	8
	Panitilla	1996-97	DO	DO	116	1996-97	-do-	4
	Juri	1996-97	DO	DO	116	1996-97	-do-	15
	Juri	1995-96	DO	DO	20	1995-96	-do-	5
	Sailenbari	1995-96	DO	DO	20	1995-96	-do-	5
	Panitilla	1995-96	DO	DO	20	1995-96	-do-	4
	Nalkata	1995-96	DO	DO	20	1995-96	-do-	1
	Amarendra	1995-96	DO	DO	30	1995-96	Senior tapper	13
	Juri	1995-96	DO	DO	49	1995-96	-do-	12
	Rowa	1995-96	DO	DO	30	1995-96	-do-	8
	Juri	1995-96	DO	DO	78	1995-96	T.T.School	14
	Amarendra	1995-96	DO	DO	15	1995-96	Senior tapper	10
	Saidarpar	1995-96	DO	DO	15	1995-96	-do-	2
	Amarendra	1994-95	DO	DO	17	1994-95	-do-	10
	Saidarpar	1994-95	DO	DO	17	1994-95	-do-	2
	Rowa	1994-95	DO	DO	30	1994-95	T.T.School	29
	Juri	1994-95	DO	DO	80	1994-95	T.T.School	14
	N.C.Para	1994-95	DO	DO	15	1994-95	Senior tapper	4
	Amarendra	1993-94	DO	DO	21	1993-94	TCPS	10
	Rowa	1993-94	DO	DO	25	1993-94	-do-	12
	Rowa	1993-94	DO	DO	25	1993-94	TCPS	15
	Ratacherra	1993-94	DO	DO	15	1993-94	TCPS	8
	Panitilla	1993-94	DO	DO	30	1993-94	-do-	10
	Juri	1993-94	DO	DO	35	1993-94	-do-	12
	Rowa	1992-93	DO	DO	45	1992-93	-do-	10
	Juri	1992-93	DO	DO	75	1992-93	T.T.School	16
	Juri	1992-93	DO	DO	45	1992-93	-do-	25
	Juri	1991-92	DO	DO	58	1991-92	-do-	25
	Juri	1991-92	DO	DO	23	1991-92	-do-	25
	Ratacherra	1991-92	DO	DO	14	1991-92	-do-	17
	Ratacherra	1991-92	DO	DO	74	1991-92	-do-	20

	Juri	**1985-86**	**DO**	**DO**	**30**	**1985-86**	**Sachirambari**	**15**
	Juri	**1987-88**	**DO**	**DO**	**25**	**1987-88**	**Senior tapper**	**16**
	Juri	**1988-89**	**DO**	**DO**	**30**	**1988-89**	**-do-**	**44**
	N.C.Para	**1986-87**	**DO**	**DO**	**30**	**1986-87**	**Sachirambari**	**7**
	N.C.Para	**1987-88**	**DO**	**DO**	**25**	**1987-88**	**Senior tapper**	**17**
	Panitilla	**1987-88**	**DO**	**DO**	**15**	**1987-88**	**-do**	**14**
	Ratacherra	**1982-83**	**DO**	**DO**	**30**	**1982-83**	**Sachirambari**	**38**
	Ratacherra	**1983-84**	**DO**	**DO**	**30**	**1983-84**	**-do-**	**20**
	Ratacherra	**1987-88**	**DO**	**DO**	**15**	**1987-88**	**Senior tapper**	**21**
	Ratacherra	**1989-90**	**DO**	**DO**	**15**	**1989-90**	**-do-**	**10**
	Nalkata	**1988-89**	**DO**	**DO**	**10**	**1988-89**	**-do-**	**5**

15.3 Policy for local workers and Vendors.

TFDPCL follows all the statutory obligations and norms with respect to employment of local workers and engagement of local vendors including ensuring their rights, benefits and all other welfare measures. The rubber latex collectors are termed as “Beneficiaries/ Tappers” and are provided with tapping tools, safety gears, gum boots etc. In addition to direct payment for their latex collection, the beneficiaries are also entitled for productivity bonus. All the latex collectors are from the local community.

In case of death or retirement of any tappers (local workers), TFDPCL allots the tapping block of the deceased / retired tapper to his family members in a preferential manner.

A tapper on retirement (attaining 58 years of age) is engaged for temporary work as casual worker in a preferential manner.

Annex 1

Tree Extraction Plan & Plan for re-plantation by TFDPC Ltd for next five Years (2013-14 to 2017-18)

Name of Division	Name of Centre	Year of Plantation		Year of Felling									Total		Reason for felling
			2013-14		2014-15		2015-16		2016-17		2017-18				
			Area in Ha	Nos of tree	Area in Ha	Nos of tree	Area in Ha	Nos of tree	Area in Ha	Nos of tree	Area in Ha	Nos of tree	Area in Ha	Nos of tree	
North	Juri	1981	12	1100									12	1100	Over Matured
		1977	7	800									7	800	Over Matured
		1978					43	4550					43	4550	Over Matured
		1980									20	1900	20	1900	Over Matured
	NC Para	1977			9.5	2330					20	4000	29.5	6330	Over Matured
		1978			20	2360	11	1400					31	3760	Over Matured
		1979							33	2340			33	2340	Over Matured
	Rata cherra	1974	15	1066									15	1066	Over Matured
		1975					12	2132	13	2665			25	4797	Over Matured
		1976					20	3900	20	2400			40	6300	Over Matured
		1977					12.5	1747					12.5	1747	Over Matured
		1979									2.5	547	2.5	547	Over Matured
	Nalkata	1981	16	1700	16	1900							32	3600	Low Productivity

	Sub total		**50**	**4666**	**45.5**	**6590**	**98.5**	**13729**	**66**	**7405**	**42.5**	**6447**	**303**	**38837**	
Factory Division	Paticheri	upto 1980	6	1000	4.35	700							10.35	1700	Over Matured
	Takmacherra	1980	15	2250	15	2250	15	2250	15	2250	15	2250	75	11250	Over Matured
	Sub total		**21**	**3250**	**19.35**	**2950**	**15**	**2250**	**15**	**2250**	**15**	**2250**	**85.35**	**12950**	
South-1	Sachrambari	1973	7	1400	7	1400	7	1400	7	1400	7	1400	35	7000	Over Matured
		1974	10	2500	10	2500	10	2500	10	2500	10	2500	50	12500	Over Matured
		1975	8	2000	8	2000	8	2000	8	2000	8	2000	40	10000	Over Matured
		1983	3.4	850	3.4	850	3.4	850	3.4	850	3.4	850	17	4250	Over Matured
	Abhangcherra	1984	24	6000	24	6000	24	6000	24	6000	24	6000	120	30000	Over Matured
	Chittamara	1988									5	1250	5	1250	Low Density
	UBC Nagar	1986							4.7	1175	4.7	1175	9.4	2350	Low Density
	Ekinpur	1986	10	2500	10	2500	10	2500	10	2500	10	2500	50	12500	Low Density
	Kalshimukh	1976	2	400	2	400	2	400	2	400	2	400	10	2000	Over Matured
		1977	2.8	560	2.8	560	2.8	560	2.8	560	2.8	560	14	2800	Over Matured
	Sub total		**67.2**	**16210**	**67.2**	**16210**	**67.2**	**16210**	**71.9**	**17385**	**76.9**	**18635**	**350.4**	**84650**	
South II	West Ludhua	1978	11.8	2680									11.8	2680	Over Matured
		1979			13	1620	13	1620	13	1620	13	1620	52	6480	Over Matured

	Baishnav Pur	1986							4	520	4.5	575	8.5	1095	Low Density
	Sub total		**11.8**	**2680**	**13**	**1620**	**13**	**1620**	**17**	**2140**	**17.5**	**2195**	**72.3**	**10255**	
Sadar	Kalamchoura	1986									6	307	6	307	Low Density
		1987									10	600	10	600	Low Density
	Nirvoypur	1994									8	599	8	599	Low Density
	Sub total		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**24**	**1506**	**24**	**1506**	
Area in Ha to be felled			**150**		**145.05**		**193.7**		**169.9**		**175.9**		**834.55**		
Nos of Trees to be felled				**26806**		**27370**		**33809**		**29180**		**31033**		**148198**	
Volume in Cum				**6701.5**		**6842.5**		**8452.25**		**7295**		**7758.25**		**37049.5**	