

Govt. of Uttar Pradesh

**DEPARTMENT OF PLANNING  
ECONOMICS &  
STATISTICS DIVISION**



**PROJECT REPORT**

*on*

STUDY TO KNOW THE PERCENTAGE AND VALUE OF THE RAW MATERIAL  
SOURCED THROUGH U.P. FORESTS BY PLYWOOD AND KHAIR (KATTHA)  
INDUSTRIES IN U.P.

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*Study to know the percentage and value of the raw material sourced through  
U.P. Forests by plywood and Khair (Kattha) industries in U.P.*



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## PREFACE

The wood based industries constitute a substantial contribution in the economy of the state. Various industries are located in the different parts of Uttar Pradesh. The wood is used as raw material in manufacturing the very vital products used in different walks of life e.g. pulp & paper, building construction, sports, housing, furniture, packaging, agriculture goods, plywood & veneer, match and fuel wood. Acacia Catechu (Kattha) is also obtained from the Khair wood found in our forests. This industry has a huge market due to big demand.

The Economics & Statistics Division of State Planning Institute (DES) is the agency which conducts all the statistical activities in the state. They are involved in carrying out reviews of the state economy for making future plans for development. It applies different measures to collect authentic information and data with the help of technical surveys and studies, especially for those areas for which the official data does not exist or are insufficient. Their objective is also to collect, compile, analyses and disseminate data for the economic planning. It has the responsibility of supporting the planning department in preparing the state and district plans.

Looking at the dire need of the information from the untouched or lesser frequented areas of plywood & Kattha industrial sector, the responsibility of making research study was given to "RAK Management Consultants, Lucknow". The consultants worked industriously and with full dedication. This report is the outcome of their intensive researches and systematic compilation. It is hoped that the study will prove conducive to the government and will be instrumental in making the state future plans.

The team not only collected the information from the industries but also confronted the hindrances and the grass root problems experienced by the industry owners. The concerned authorities are anticipated to look into the problems which are genuine and require immediate consideration and solution. Undoubtedly, the impact would be beneficial for both. The industry owners would feel encouraged and their faith in the government will strengthen whereas the economic gains of the government would flourish too.

  
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We also place on record the support provided by Mr. Ashok Agarwal, President, U.P. Wood Based Industry Association, Lucknow during the study. We also express our thankfulness to Mr. Muslim Qureshi, President, Mr. Daud Ahmad Khan, Vice President and Mr. Deepak Goel, Secretary, Rampur Veneer Manufacturing Association for organizing the needed workshop and helping us in data collection from the Plywood & Veneer units. No report is complete without the real time pictures and process information. Mr. Pradeep Kumar Singh, Assam Wood Products happily cooperated with us in availing the two. His help is greatly acknowledged.

It would not have been easy for our team to gather the information about the Kattha industries if Mr. Pawan Kumar Agarwal of Tirupati Wood Products, Mr. Raj Kumar Kaya of Brijraj Agro Products, Kanpur, Mr. Shishir Awasthi of Upmanyu Industry, Unnao and Mr. Vishal Maheshwari of AWP, Kanpur hadn't provided their whole hearted cooperation by motivating others. We applaud them immensely.

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# Chapter-1

## INTRODUCTION

The Economics & Statistics Division (ESD) of the State Planning Institute regularly brings out the periodical estimates of GSDP. These estimates are prepared on the guidelines provided by the Central Statistical Office, Government of India. The ESD has observed that the rapid economic developments are taking place in the State of Uttar Pradesh. Due to the non-availability of any data, many sectors in the state economy are left out in the calculation of GSDP. To improve the quality of the estimates of GSDP, Government of Uttar Pradesh through its Economics & Statistics Division, Department of Planning intends to bridge the data gaps in the different sectors of the state economy by commissioning various studies. The study of the plywood and kattha industry under consideration is one such sector for which the required data has to be procured.

The research submitted here is the part of a centrally sponsored scheme “Support for Statistical Strengthening (SSS)”. Its responsibility was entrusted to “**RAK Management Consultants, Lucknow**” under the project title “*Study to know the percentage and value of the raw material sourced through U.P. Forests by plywood and khair (Kattha) industries in U.P.*” By the Directorate of Economics & Statistics, State Planning Institute, Govt. of U.P., Lucknow. As it is apparent from the title that the study has been carried out for two major Wood Based Industries ‘Plywood’ & ‘Kattha’. The Plywood industry is controlled by the State Forest Department, under the guidelines issued by the Ministry of Environment, Forest and Climate Change, dated 11<sup>th</sup> November, 2016, on the other hand the kattha industry works independently. The study revolves around the raw material used by these industries are obtained from the government sources. The research took four effective months to complete.

It underwent the field surveys to investigate the resources of the raw material required, obtained and consumed by the Plywood and Kattha Industries and an intensive statistical analysis which covered the necessary aspects like quantitative value, number of industries running and comparative cost of the raw material in the last three years. It investigated the possibilities for the industrial expansion, trace, compare and measure the changes, desired results etc. besides getting the feedback and it tried to understand thoroughly each "Why" connected with the industries.

The study aimed at pointing out the inherent positives and negatives. A good care was taken for the survey to run smoothly and ensure that the respondents cooperated happily and

an accurate data could be collected. An understanding and amicable attitude was maintained throughout the study by the representatives with an assurance to keep the received information a total secret and not to be misused. All the obtained information will serve as the bedrock for coming to the right conclusions, decisions, seeking appropriate strategies for the betterment and providing workable suggestions to help the industries.

This was just an effort for sandpapering the rough edges away, winning confidence and good will, finding solutions and ways for better results and assist in the economic development of the state.



## Chapter-2

### OBEJCTIVE OF THE STUDY

*"Study to know the percentage and value of the raw material sourced through U.P. Forests by plywood and Khair (Kattha) industries in U.P."*

The study here refers to two major wood industries one is the 'plywood' and the other is the 'kattha'. The manufacturing of both the products under goes a series of processes but totally different in their nature. The plywood industries depend upon the government permission and can only be established after obtaining a valid license from the forest department whereas the kattha industries work independently. The plywood has its market in building and construction area and on the other hand Kattha comes under edible & medicinal ingredient. Its by-product catch is used by the tanning, additive and preservative industries.

Besides the Primary Objective Study also focussed on

- (i) To estimate the real need of the raw material for an industry and situation of the industry is based on various aspects like production, sales, turnover, man-power and machinery etc.
- (ii) To find the situation of the kattha industry based on the consumption of raw material, production, sales, manpower, machinery and turnover etc.



## Chapter-3

### EXECUTIVE SUMMARY

#### 3.1 Plywood Industry

The **plywood industry** is growing rapidly with swift increase in consumption of the raw material, working capacity and the demand of their finished product in the market where we shall include the major findings of the study based on the information collected as:

- 3.1.1 Quality of the raw material i.e. the timber must be green and fresh for manufacturing of the veneer.
- 3.1.2 Average length of the log used in the industry varied from 1.0 meter to 1.5 meters, as the new machines peel logs of this size only. During the study it was observed that the machine with the capacity of the peeling of 8 feet log are in deplorable condition.
- 3.1.3 U.P. Forest Corporation is not able to supply the usable wood for this industry mainly due to their tedious procedural constraints which forces the industry to purchase their raw material from the open market only.
- 3.1.4 Consumption of the raw material for this industry particularly for the ‘veneer’ and the ‘plywood & veneer’ units was about five times (i.e. 32.68 lakh MT) higher in the last financial year 2018-19 against the norms set by IPIRTI Bangalore (about 6.15 lakh MT) with the projection to increase it up to 7 times in 2019-20.
- 3.1.5 Consumption of the raw material for this industry (32.68 lakh MT) was about 2.5 times higher in 2018-19 than the wood available for this industry in 2014 as calculated by CEC (about 13.18 lakh MT).
- 3.1.6 The total production of the ‘veneer’ in 2018-19 was about 9773.30 lakh square meter and the production of the plywood was 1227.26 lakh square meter in 2018-19.
- 3.1.7 Working capacity of the machine is 5 times higher (about 6309 MT annually) against the norm set by IPIRTI, Bangalore (about 1362 MT annually) and it is 1.5 (about 11.5 Hrs.) times per day than the norms of 8 hours a day.
- 3.1.8 Industry uses about 65% of the unskilled labour for their manufacturing process which allows them to work easily and economically.

- 3.1.9 Power consumption by this industry annually amounts to Rs.168. 19 Cr. with 20.51 Cr. units of the electricity at the average rate of Rs. 8.2 per unit, moreover this industry depends almost 50% upon generator for power.
- 3.1.10 Revenue generation by the industry was about Rs. 443. 14 Cr. for the financial year 2018-19 which may increase to Rs. 587.42 Cr. in next financial year.

### **3.2 Kattha Industry**

The **Kattha Industry** in Uttar Pradesh is not fully dependent on the material provided by the government. Mostly these units procure their raw material from the open market preferably in the shape of semi processed material. The major findings were as below:

- 3.2.1 The main raw material i.e. Khair wood consumed was 5517.83 metric tons in 2018-19. Out of this only 10% wood (559.25 metric tons) was supplied by Forest Department.
- 3.2.2 In addition to the khair wood, industries also use ‘Khair juice, Cashew husk and Gambier’ in the manufacturing of the Kattha.
- 3.2.3 The Gambier is being imported from the other countries like Indonesia and Malaysia.
- 3.2.4 Consumption of the Gambier was being done in a very high quantity i.e. 7605.5 metric tons imported from the foreign countries.
- 3.2.5 Due to the high rate of the khair wood from the forest department about Rs. 32194 per metric ton in 2018-19 factories now opt for the local market where cheaper Khair is available at about Rs. 29877 per metric ton.
- 3.2.6 The consumption of the Cashew husk was also very high at 16635 metric ton in 2018-19 at the rate of Rs. 19239 per metric ton.
- 3.2.7 The production of the kattha was about 6247 metric ton and the production of the cutch was 5635 metric tons in 2018-19.
- 3.2.8 Keeping the average rate of the Kattha at Rs. 500 per kg. & the Cutch at Rs. 30 per kg., the industry has generated a turnover of about Rs. 286.39 Crores in 2018-19.
- 3.2.9 Each kattha factory consumes about 1.19 lakh units of electricity amounting to the average expenditure of Rs. 89.96 lakh per factory.
- 3.2.10 The ratio of the skilled and the unskilled labour was about 3:1



## Chapter-4

### DESIGN OF STUDY

A fundamental quantitative research study has been conducted to meet the objectives of the survey. The research method adopted, constitutes population identification, sampling selection, data collection for the primary & secondary sources, data analysis and finally preparing the report. A pre-tested questionnaire was used for the data collection through personal interviews by visiting the factories and through emails (attached herewith as enclosure - I and II).

#### 4.1 DATA REQUIREMENTS

**4.1.1 PRIMARY DATA:** The primary data is the first hand collection, thus is original in character. The primary data includes the information gathered through questionnaire, observations and interviews with the company personnel at different levels of the management. The primary data comprised of the following information sought from the selected units:-

- a. Personal details
- b. Resource availability
- c. Quality of the raw material required
- d. Number of machinery installed and their respective working capacity.
- e. General suggestions for the betterment of the industry

**4.1.2 SECONDARY DATA:** The secondary data are those which are already available in the balance sheets of the units, business journals, annual reports of the different departments, brochures, websites etc. The ESD has also issued letters\* to the Heads of the Departments of the following organizations, requesting them for extending their cooperation and support to the consultants by providing the secondary data of their organizations required for this study:-

- i. Head of the Forest Force & Principal Chief Conservator of Forests, U.P.
- ii. Managing Director, U.P. Forest Corporation, Lucknow

The consultants also visited the following institutes and offices for fetching the relevant information:-

- iii. Director, Industries, Kanpur, U.P.
- iv. Forest Research Institute, Dehradun
- v. Forest Survey of India, Dehradun
- vi. Indian Plywood Industries Research & Training Institute, Bangalore

\* 1. Director, ESD's letter no. 33/SSS-09/Studies/2018, dated 26.04.2019

2. Director, ESD's letter no. 34/SSS-09/Studies/2018, dated 26.04.2019

Apart from this all the selected units in the sample were requested for providing information regarding the raw material consumption, production, sales, turnover, tax paid, manpower used and power consumption quoted in their balance sheets and the profit and loss statements.

#### 4.2 CENSUS OF KHAIR INDUSTRY

In Khair Industry there were only 13 units found operational in Uttar Pradesh, of which the census was done.

#### 4.3 SAMPLE SIZE CALCULATION FOR PLYWOOD INDUSTRY

Sample size is a statistical concept that involves determining the number of the observations or replicates (the repetition of an experimental condition used to estimate variability of a phenomenon) that should be included in a statistical sample. It is an important aspect of any empirical study requiring the inferences to be made about a population based on a sample. Essentially, the sample sizes are used to represent parts of a population chosen for any given survey or experiment. To carry out this calculation, set the margin of error,  $\epsilon$ , or the maximum distance desired for the sample estimate to deviate from the true value and solve for the sample size,  $n$ . The equation for calculating the sample size is shown below.

$$n = \frac{z^2 * p * (1 - p)}{\epsilon^2}$$

Where

$n$  = required sample size

$z$  is the z score

$\epsilon$  is the margin of error

$p$  is the population proportion

So the first type of units which are producing only Veneer we set z score at 1.96 i.e. 95% confidence level, margin of error at 16% and  $p=0.47$  to calculate sample size of 36 unit for these units similarly for 'Plywood & Veneer' units sample size calculated with the same confidence level, margin of error at 18% and population proportion  $p = 0.36$  as 27, for 'Plywood' units margin of error set at 20%,  $p=0.16$  z score remain 1.96 to calculate the size as 13 the total sample size for all the three types of units came as 76, here we took margin of error in a range of 16 to 20% keeping in view the relevance (type of raw material required i.e. wood or veneer) of the unit in other words the relevance of the veneer manufacturing units was the highest as their raw material is only wood (logs) so the least margin of error

was given to such units, time constraint was also an important factor for collection of the data i.e. we couldn't take a sample which was impossible to cover in the given time frame and only be adjusted by increasing the margin of error, last but not least response from the units in providing the required information was kept in view for the validity of the data.

#### 4.4 SAMPLE SELECTION PROCEDURE FOR PLYWOOD INDUSTRY

The stratified simple random sampling, without replacement method was being used (strata were decided upon type of factory based on manufacturing of 'Veneer', 'Plywood & Veneer' and 'Plywood') for obtaining the required sample size by first arranging the list of all 473 units in a random manner to avoid biasness then 76 random numbers were drawn between 1 and 473 to select the units, using this procedure the sampled units were obtained for the study.

#### 4.5 FORMULA USED

**(i) Mean**

$$\text{Mean } \bar{x} = \frac{1}{n} (\sum xi)$$

Where:  $x_i =$  value for  $i^{\text{th}}$  sample in stratum

$n =$  number of sample in stratum

**(ii) Standard Error (SE)**

$$SE = \frac{\sigma}{\sqrt{n}}$$

Where:  $\sigma =$  Standard Deviation of the stratum

$n =$  number of sample in stratum

$$SE (\%) = \frac{SE}{\sum x_{ij}} \times 100$$

Where SE = Standard Error of the Stratum

$\sum x_{ij} =$  Sum of the value of sample in that Stratum

**(iii) Model of fit (short cut method)**

$$Y = a + bX$$

$$\text{Where } a = \frac{\sum Y}{n}$$

$$\text{and } b = \frac{\sum XY}{\sum X^2}$$

Where X is taken as year and

Y as dependent variable accordingly.

(iv) **Z test for significant difference of means:**

The test statistic is a z-score (z) defined by the following equation.

$$z = (x - M) / [ \sigma / \text{sqrt}(n) ]$$

Where “x” is the observed sample mean, “M” is the hypothesized population mean (from the null hypothesis), and “σ” is the standard deviation of the population.

#### **4.6 APPROACH ADOPTED FOR DATA COLLECTION**

Once the questionnaire was finalised then the research team visited the selected sample units, intensive interactions were held to make them understand the reasons and the benefits of the study. Team had to make many efforts. Sometimes they had to visit the sites again and again in order to take the respondents in faith. Initially the team felt that the managers/employees and even the promoters of the Industrial Units were not comfortable and were apprehensive in revealing the data required for the project because the company documents were not meant to be revealed to the public. The front line team was supported with the backups by the head office telephonically or through e-mails. It took quite some time for most of them to understand the study objectives. Gradually, some of them began to open up and provided the required information. The study team was even allowed to go around the factories and see the process of the veneer, plywood and Kattha making. The process of the study became comfortable when the letter issued by the ESD was attached with the questionnaire, which assured the respondents that no risk and harm was involved in the study.



*Pic 1: Research team in the workshop of plywood veneer factory owners held at Rampur*

For a better understanding two workshops were organised in Rampur by the consultants. The participants included veneer manufacturing industrialists. It gave them a platform to express their doubts, difficulties and grievances. The workshop organisers put in their best to sort out the snags. Some of them have been mentioned in the chapter "Discussion and Suggestions".



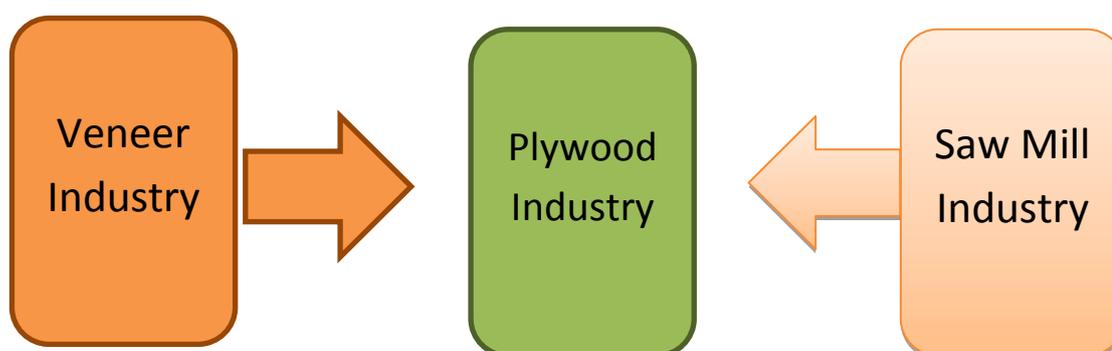
*Pic 2: Veneer manufacturers participating in workshop*



## Chapter-5

### WORKING OF PLYWOOD INDUSTRY

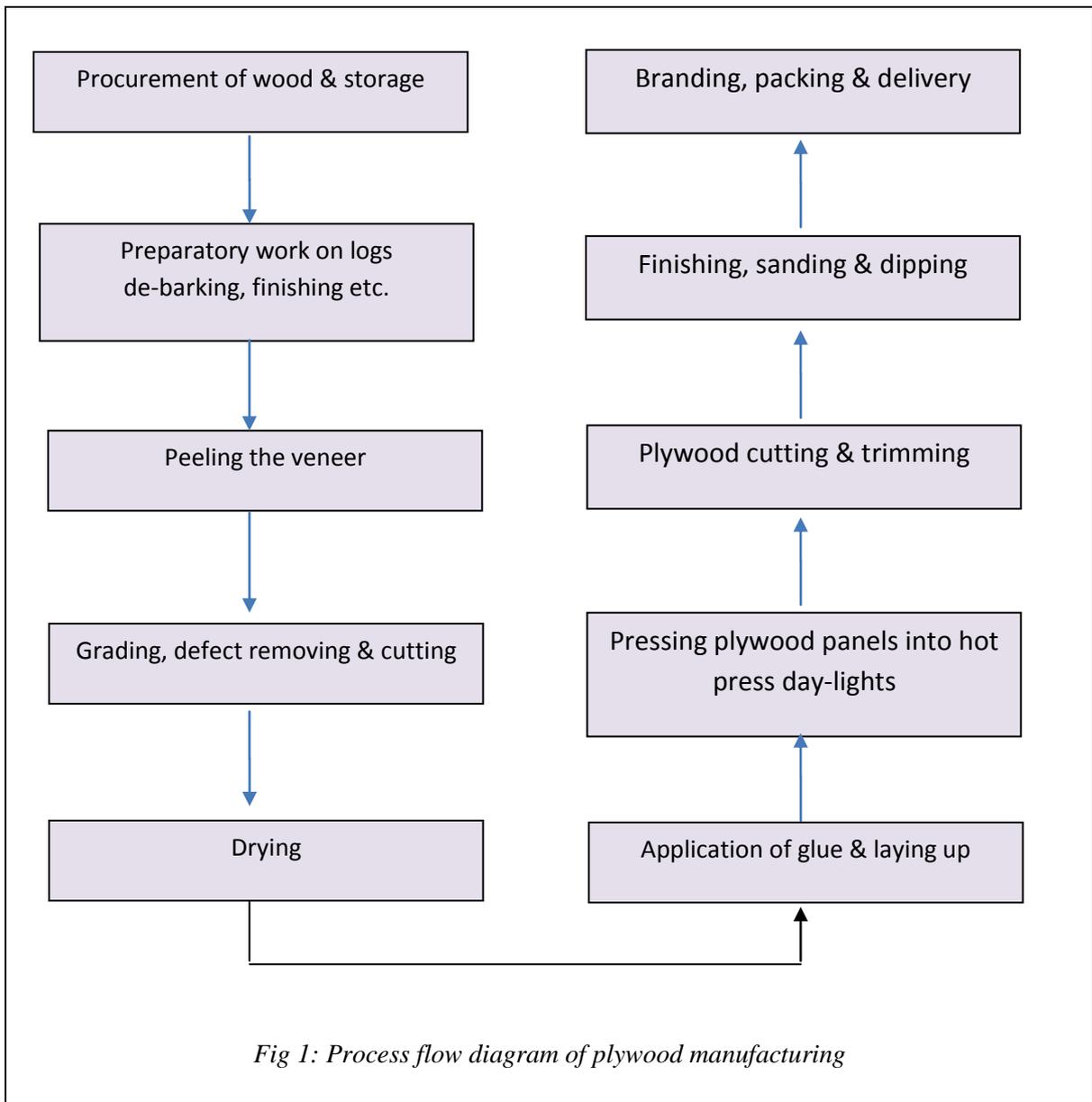
The plywood manufacturing is supported by the peeling industry and the saw mill industry simultaneously. The peeling industries supply veneer sheets for plywood manufacturing to the plywood units. The saw mills are involved in cutting the wood to produce planks which are also supplied to the plywood industries who manufacture Block Board and Flush Doors and wherein the sawing facility is unavailable.



The Board manufacturing units require 75 % of raw material as timber from the saw mill industry, 25 % raw material as veneer through the veneer industry. The plywood manufacturing units does not require any timber as they use 100% raw material as the veneer. The manufacturing of the plywood consists a number of activities such as preparatory work on logs, peeling, clipping/segregation, drying, gluing, assembling, pressing, trimming, sanding, and finishing. The complete simplified process in an integrated plywood unit is shown through a flow chart.

#### 5.1 DESCRIPTION WITH FLOW DIAGRAM

The manufacturing of plywood includes a number of activities such as procurement of wood and its storage; preparatory work on logs-debarking and finishing etc; peeling the veneer; grading, defect removing and cutting of the veneer sheets; drying; gluing & laying up; of pressing the plywood panels into hot press day-lights; plywood cutting & trimming; finishing, sanding & dipping and finally branding, packing and delivery. A simplified process flow diagram of an integrated plywood unit is shown below. The different steps followed in plywood manufacturing are explained further ahead.



## 1.2 DESCRIPTION WITH REAL TIME PICTURES

The different steps followed in plywood manufacturing are further explained through real time pictures further ahead.

**1.2.1 Procurement of wood & Log Storage:** The plywood and veneer manufacturers in Uttar Pradesh use logs of Poplar and Eucalyptus as the raw material. The logs are purchased, sorted and stored in the yard, species & size wise. Most of the factories procure fresh cut material from the local timber market. Transportation and handling of the logs is done manually.



*Pic 3: Unloading of Eucalyptus logs in factory yard*

**1.2.2 Log De-barking and bucking:** The initial step of the debarking is accomplished by feeding the logs through one of the several types of debarking machines. The purpose of this operation is to remove the outer bark of the log without substantially damaging the wood. After the bark is removed, the logs are cut into appropriate length in the step known as bucking.



*Pic 4: Debarking Operation on logs*

1.2.3 **Peeling the logs into veneer:** After de-barking, the logs are processed to generate veneer. This process is called the peeling. Logs are peeled using a rotary lathe machine. The wood is compressed with a nosebar and the veneer knife cuts the block into veneers 3mm in thickness. This process is similar to that of a pencil sharpener.



*Pic 5: Veneer conversion process*

1.2.4 **Grading and defect removing:** After peeling, the veneer needs to be cut to the size and go through an initial grading process. The veneer pieces are then clipped into a usable width commonly 1.37 m (54 inches) with shrinkage and trimming allowances.



*Pic 6: Defect removing & grading process on veneer*

**1.2.5 Drying the veneers:** At this point, the veneers are still wet when these must be dried for protecting the wood from fungal decay. The veneers are taken to the dryer where they are dried to moisture contents that range from 1-15% dry base. The veneer dryers may be either direct-fired or indirect-heated. In a direct-fired dryers, hot combustion gases from an onsite boiler are blended with the recirculated exhaust from the dryer to lower the gas temperature. In an indirect-heated veneer dryers, air is warmed over the steam coils and circulated over the veneer. The veneer dryers typically have one to three heated zones followed by a cooling zone. The cooling section circulates the ambient air over the veneer to reduce the veneer temperature just before removing it from the dryer.



*Pic 7: Veneer drying process*

**1.2.6 Application of Glue & Lay-up:** The veneers are run through a gluing machine which essentially rolls the glue onto the face and the back of the veneer. They are then placed on the top of an unglued veneer so that the stack alternates; glued, unglued, glued, unglued so on and so forth.



*Pic 8: Veneer gluing process*



*Pic 9: Veneer laying process for raw plywood*

**1.2.7 Pressing the plywood panels into hot press day-lights:** At this stage of the production process, where the actual panels begin to take shape, multiple panels are loaded into the daylight press. The Daylight Press then compresses and maintains the heated pressure on the boards for a long period of time. This creates and maintains the required contact between the glue and the veneers. It also decreases the tension in the glue line and the thickness of the glue layer.



*Pic 10: Compressing process of multiple panels in a daylight machine*

**1.2.8 Plywood Cutting & Trimming:** After the completion of the pressing process, the board is left to stabilise and cool down before further processing. Then the process of trimming down the excessive veneer is applied, so that the board has square edges.



*Pic 11: Plywood cutting & trimming process*

**1.2.9 Finishing, Sanding & Dipping:** After cutting and squaring the edges of the boards the finishing process starts. The Boards are firstly sanded by using a large automated mechanical sander followed by being dipped for colouring.



*Pic 12: Sanding and Finishing process on plywood*



*Pic 13: Colouring process of plywood*

**1.2.10 Branding, Packing & Delivery:** The finished sheets are stamped with a grade-trademark that gives the buyer information about the exposure rating, grade, mill number, and other factors. Sheets of the same grade-trademark are strapped together in stacks and moved to the warehouse to await shipment.



*Pic 14: Branding of the plywood*



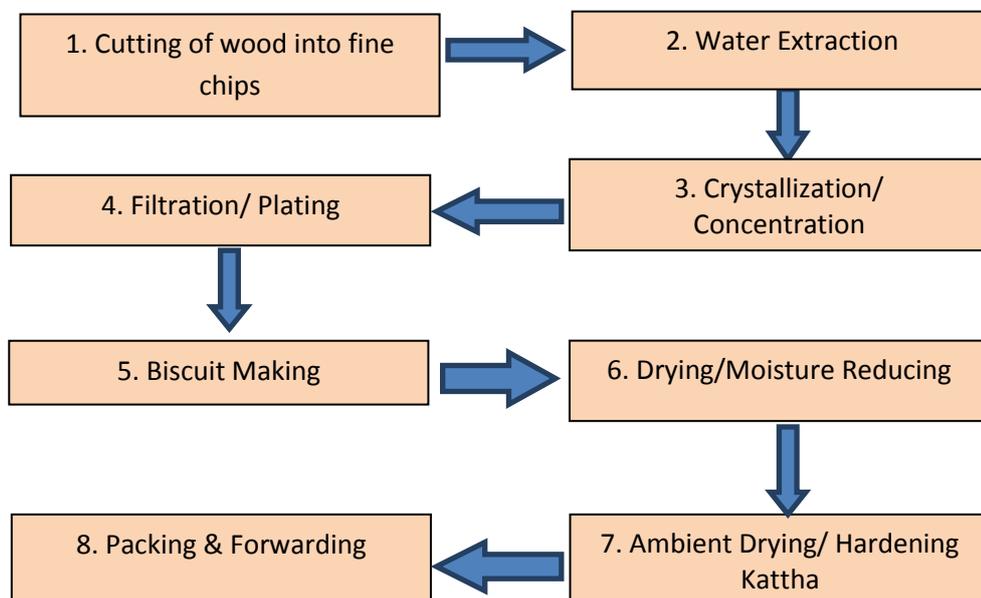
## Chapter-6

### WORKING OF KATTHA INDUSTRY

The process of Kattha making is a long and arduous process, which takes upto 45 days. Each step in the production process is closely monitored and appropriate climatic conditions are maintained for getting the optimum colour and quality. Kattha & cutch are extracted from the wood of the Khair tree. In short a good quality of Khair Wood (Acacia Catechu) is procured. Each log is stripped manually or mechanically and separated from the sap wood. The Heart wood of Khair (Acacia) is cut into fine chips and chips are kept in wire net cage to avoid the direct contact with the heated surface of the extractor. These cages having water about 3 times the weight of the chips are placed in extractors. Extraction is done by boiling chips with water for about 3 hours. Extracts from each extractor are mixed after filtering with the help of muslin cloth and concentrated in an open pan on fire and then kept in shade to facilitate crystallization of Kattha for about 2 days. After complete crystallization, the curd like mass is passed through frame and a filter press resembling a plate, operated manually and then washed with cold water which improves the quality of Kattha. It is then placed on the canvas cloth fixed with wooden frames to separate the traces of the cutch. Finally, Kattha is cut into uniform tablets with the help of wire cutter or knife and dried in sheds. The mother liquor after removal of Kattha is further concentrated in an open pan till it becomes viscous and then poured in wooden frames for drying. The dried material is cutch. Yield largely depends upon the quality of chips.

#### 6.1 DESCRIPTION WITH FLOW DIAGRAM

The complete process is explained through the flow chart here:



## 6.2 DESCRIPTION WITH REAL TIME PICTURES

The different steps followed in Kattha manufacturing are further explained through real time pictures further ahead.

### 6.2.1 Removal of bark for the heartwood

For the extraction of Kattha, only heart wood is necessary. So the sap wood and bark of *Acacia Catechu* is removed by the help of machine called de-barker. The heart wood is converted into billets by bent saw and then shifted to next compartment for further processing.



*Pic 15: De-barking operation*

### 6.2.2 Chipping

The billets are transferred to chipper machine that converts the billets into small chips. These chips are approx. 2" to 5" in length. These chips are transferred for further processing.



*Pic 16: Chipping the heartwood*

### 6.2.3 Autoclave (Water extraction)

The chips are put into a pressure chamber called an autoclave. These chips are boiled with water, where pressure and temperature is maintained (150°C) with respect to air pressure. This leads to the extraction of hot liquid.



*Pic 17: Autoclave for the extraction of hot liquid*

### 6.2.4 Evaporator for Concentration

The liquid extracted from autoclave is moved to next chamber, called evaporator, in which the concentration of liquid gets increased. The concentrated material gets crystallized, through the cooling process.



*Pic 18: Concentrating process through evaporator*

### 6.2.5 Filtration/Plating

The rectangular pieces are made and pressure is given to it. The liquid substance called "**Kutch**" emerged out as a by-product.



*Pic 19: Rectangular biscuit cutting*

The rectangular pieces are cut into biscuit like shape, called Kattha.



*Pic 20: Catechu dried sheets cutting into Kattha biscuits*

### 6.2.6 Drying

Kattha is dried into a drying chamber for 15-20 days in cold air. The moisture gets reduced in this chamber.



*Pic 21: Cold drying chamber*

### 6.2.7 Ambient Drying

This is the last stage of extraction of Kattha. This chamber includes hot air which hardened the Kattha. After the ambient drying, it gets ready for packing.



*Pic 22: Ambient drying for hardening the Kattha*

## 6.2.8 Packing

At last Kattha is packed in a carton and sold to market of India and abroad.



*Pic 23: Kattha packing process*



## Chapter-7

# SECONDARY DATA ON PLYWOOD INDUSTRY

### 7.1 NORMS OF TIMBER REQUIREMENT

The Indian Plywood Industry Research & Training Institute (IPIRTI), Bangalore, an autonomous body under the Ministry of Environment, Forest and Climate Change, has assessed the timber requirement per unit for the peeling length of 4 feet and 8 feet size in the plywood /vener units as 5 M<sup>3</sup> and 11 M<sup>3</sup> respectively per day on an average of 8 working hours per day for 300 days in a year, it is assumed that the normal requirement of the timber with the peeling length of 4 feet size in veneer units is 1500 M<sup>3</sup>. The total requirement of the timber for the stand alone veneer units may be assessed by calculating the equivalent number of 4 feet length machines and by taking its normal installed capacity as 1500 M<sup>3</sup> per annum.

The requirement of timber of a plywood unit may be taken as 'nil' on the ground that the round timber is used in the veneer units only and that the plywood units are the secondary users which use the veneer as the raw material produced by the veneer units. The plywood units use presses of various sizes such as 8x4x6, 8x4x12, 8x4x15, 4x4x7, 4x4x10. A press with 8x4x10 capacity can produce upto 10 plywood pieces of 8'x4' size per hour whereas a press with 8x4x15 capacity can produce upto 15 plywood pieces of 8'x4' size per hour and so on. The normative installed capacity of the plywood units will accordingly depend upon the number and the type of presses. This number and type of presses installed in each of the plywood unit may be assessed and thereafter equivalent number or presses of 8x4x10 capacity may be calculated. The normative annual timber requirement for a integrated plywood unit having a 8x4x10 capacity press may be taken as 2000 sq. mt. per annum, and accordingly the total requirement of the timber for the plywood units should be calculated.

### 7.2 CONSUMPTION OF RAW MATERIAL

The consumption of raw material in Plywood & Veneer Industry depends upon the capacity of the machinery installed by the units. In the year 2006-07 the veneer factories used hydraulic peeling machines manufactured in India. According to the norms of timber consumption fixed by the Indian Plywood Industries Research & Training Institute, Bangalore, these machines had the annual peeling capacity of 1500 M<sup>3</sup>wood, which meant 125 M<sup>3</sup> wood per month. With the arrival of open international market in the year 2014-15 the foreign made technically advanced machines came in. Gradually the plywood manufacturers replaced the local machines with the modern ones. Their peeling capacity is 500 Cu. M. Wood per day which means 1200-1250 M<sup>3</sup> wood per month. The peeling which

the foreign machines could do in a month, the machines made in India did it in one year, this was the vast difference in wood consumption. This led to great increase in the demand of the wood. All the old norms of wood consumption set by the Indian Plywood Industries Research & Training Institute, Bangalore (IPIRTI) became insignificant. The new technology in the peeling of the wood attracted the new entrepreneurs and the pressure for new licenses increased too. The State government offered 1348 industrialists for licenses to the wood based industries in the year 2018-19, out of which provisional licenses have been issued to 1215 units only.

### **7.3 GUIDELINES FOR PLYWOOD & VENEER INDUSTRY**

Hon'ble Supreme Court of India in its first major order in the T. N. Godavarman Thirumulpad case on December 12, 1996, the court inter alia re-defined the scope of the Forest Conservation Act 1980, suspended tree felling across the entire country, and sought to re-orient radically the licensing and functioning of the forest based industries. The court also observed that in respect of the plywood and veneer units, the detailed guidelines would be issued by MoEF for regulating the maintenance and the reconciliation of the records by these units as well as the State Government in respect of the receipt of the raw material such as timber, veneer etc., conversion into finished products, disposal and transportation.

As was brought out in the hearings that one of the serious causes of degradation of forests was the lack of knowledge on the extent of exploitation of the forests and especially due to the forest based industries such as saw mills, veneer mills and plywood mills. The Court thus asked all State Governments to file a report regarding the saw mills, veneer mills and plywood mills. Meanwhile the Court also directed that all unlicensed wood based industries be closed all over the country. It also made it clear that the CEC's permission shall be required for opening of a new wood based industry all over the country. It stated: *"No State Government or Union Territory will permit the opening of any saw mills, veneer or plywood industry without prior permission of the CEC. The Chief Secretary of each State will ensure strict compliance of this direction. There shall also be no relaxation of rules with regard to the grant of license without previous concurrence of the CEC"*.

### **7.4 GUIDELINES FOR GRANT OF NEW LICENCES TO WBI**

The Court and the Central Empowered Committee (CEC) held the view that before granting fresh licenses to the wood based industries in the State, there is a need to consider the availability of timber from the official sources and also look at the capacity of the existing units in the State. The CEC had asked the different State governments to provide this

information. The Supreme Court also ordered that each State shall constitute a State Level Expert Committee for the matters concerning the preparation of working with their implementation, development of industrial states, shifting of industrial units to these states, rules and regulations regarding the grant and renewal of licenses to wood based industries and other ancillary matters under the chairmanship of the Principal Chief Conservator of Forests and with a nominee of MoEF as one of its members. Any decision of this Committee which is not acceptable to the State Government will be referred to the Central Government.

## **7.5 CONSTITUTION OF THE STATE LEVEL COMMITTEE**

In compliance of the above directions the Ministry of Environment, Forest and Climate Change, Government of India constituted\* following State Level Committee (SLC) to perform the functions stipulated in the guidelines issued vide its resolution dated November 11<sup>th</sup>, 2016

*\*As contained in the Order dated October 5<sup>th</sup>, 2015 of the Hon'ble Supreme Court of India in Writ Petition (Civil) No. 202 Of 1995 in the matter of T. N. Godavarman Thirumulpad versus Union of India and others.*

- |    |  |             |
|----|--|-------------|
| a) | Principal Chief Conservator of Forests/Head of Department  | Chairperson |
| b) | A representative of the Regional Office of the Ministry of Environment, Forest and Climate Change  | Member      |
| c) | A representative of the State Forest Department not below the rank of Conservator of Forests dealing with preparation of Working Plan/ Work Scheme   | Member      |
| d) | Director/Additional Director of Department of Industries   | Member      |
| e) | Representative of the each Autonomous District Council constituted in accordance with the provisions of the Sixth Schedule to the Constitution, in case any such Council exists in the State | Member      |
| f) | Representative of the Forest Development Corporation, in case any such Corporation exists in the State   | Member      |
| g) | An officer not below the rank of Conservator of Forests working in the Forest Head Quarters  | Member      |
| h) | The State Level Committee may nominate any other officer working in territorial wing of the Forest Department not below the rank of CF.  | Member      |

The SLC will invite one representative of the industry nominated by the saw-mill association as a special invitee to each and every meeting of the State Level Committee.

### **7.5.1 POWER AND FUNCTIONS OF SLC**

Power and Functions of the SLC defined in the guidelines are:

- i) Assess the availability of timber for wood based industrial units in the State/UT every five years.
- ii) Assess quantity of different raw material requirement for wood based industrial units which may be sustainably harvested from trees outside forest areas in the State/UT.
- iii) Assess annual requirement of timber and other forest produce in the domestic market in the State.
- iv) Maintain a database of timber and other raw material utilized by each wood based industrial unit permitted to establish and operate in the State/UT during each financial year.
- v) Approve appropriate locations for setting up of wood based industrial units.
- vi) Approve the name of wood based industrial units which may be considered for grant of fresh license or enhancement of the existing licensed capacity in case the committee is satisfied that timber is available legally for the said new Wood Based industries.
- vii) The State Level Committee will ensure that the amount lying with the respective State Forest Departments (recovered from Wood Based Industries) will be utilized for the purpose of afforestation only.
- viii) Examine and make appropriate recommendations on any other matter referred by the State Government or the Ministry of Environment, Forest and Climate Change.

### **7.5.2 GUIDELINES FOR TIMBER ASSESSMENT**

The quantity of timber likely to be available for utilization of the Wood Based Industries of different types in a State/UT shall be assessed by commissioning an intensive study, preferably in collaboration with institutes/universities of repute, once in five years. The study will take into account the following:-

- a) The quantity of such raw material that may be sustainably harvested from the forest areas as per the working plans/working schemes/management plans duly approved by the competent authorities.
- b) The quantity of such raw material that is available from the trees outside forest areas, including the private plantations, agro-forestry plantations and plantations raised on non-forest government land etc.

- c) Net inter-state import of such timber; and
- d) Net international import of such timber.

## 7.6 AVAILABILITY OF RAW MATERIAL (2014)

The total growing stock of wood from trees outside the forests in Uttar Pradesh is 87.31 million cubic meter and annual availability of the wood is 55.6 lakh cubic meter (FSI: 2007). State Level Committee(SLC), constituted under the guidelines of Hon'ble Supreme Court. Based on certain assumptions the SLC has calculated the annual availability of timber for the wood based industries from the trees outside the forest as 53.01 lakh Cu. Meter. The Central Empowered Committee (CEC) further worked out the annual availability on the basis of the rotation period of the crop and modified the annual yield as 43.70 lakh Cu. Meter.

The species wise details of the quantity available for the wood based industries from the trees outside the forests are given below (2007):-

**Table-1: CEC's Estimation of Timber in U.P (2014)**

Qty - in Lakh M<sup>3</sup>

Sl. No.	Name of Species	Quantity Available	Remarks
(1)	(2)	(3)	(4)
1	Eucalyptus	14.69	Suitable for Plywood & Veneer Industry
2	Poplar	7.54	Suitable for Plywood & Veneer Industry
3	Mango	8.75	Suitable for Plywood & Veneer Industry
4	Shisham	2.86	-
5	Babool	2.16	-
6	Neem	2.52	-
7	Mahua	2.15	-
8	Jamun	1.49	Suitable for Plywood & Veneer Industry
9	Other Species	1.54	-
<b>TOTAL</b>		<b>43.70</b>	<b>-</b>

The annual availability of the wood from the forest area on the basis of the production figures of U.P. Forest Corporation has been taken as 02 lakh Cu. Meter. The annual quantity of the imported timber has been assessed by CEC to 0.60 lakh Cu. Meter

Hence the total annual timber availability for the wood based industries was estimated as below:

a) From trees outside the forests	-	43.70 lakh M <sup>3</sup>
b) From Government Forests	-	2.00 lakh M <sup>3</sup>
c) Imported Timber	-	0.60 lakh M <sup>3</sup>
<b>TOTAL</b>	<b>-</b>	<b>46.30 lakh M<sup>3</sup></b>

Out of the total available quantity of 46.30 lakh Cu. Meter timber, a tune of 30.50 lakh cubic meter timber was earmarked for the saw mills and the licenses were issued (2014) accordingly. About 14.5 lakh m<sup>3</sup> timber was allocated to the plywood & veneer industry and licenses were issued to 473 units to operate in the state.(2014)

## 7.7 AVAILABILITY OF RAW MATERIAL (2018)

The arrival of Hi-tech and superior quality machines in the plywood & veneer industry led to the outdateding of the traditional and obsolete machines. The entrepreneurs showed inclination towards the industry. They insisted the Forest Department for the new licenses. The required raw material for these industries would come from outside the forest areas. The information about the availability from the areas of the outside the forest was not readily available with the Forest Department. The Ministry of Environment, Forest and Climate Change also has made provisions for the assessment of the availability of the timber for wood based industry every five years.

As per the Forest Survey of India – State of Forest Report 2017, India has only 21.54% of Forest Cover<sup>1</sup>. Some favoured timber species have become scarce generally while others have become scarce in certain ecological zones.<sup>2</sup>Uttar Pradesh has only 6.86% of forest cover out of the total geographic area.<sup>3</sup> As per the report of Forest Survey of India(FSI) for the State of Uttar Pradesh, the total availability of wood in terms of the trees outside Forests(TOF) is 96.80% while the trees inside the forest is only 3.20%. India targets a carbon sink of 2.5 to 3 billion tonnes of CO<sub>2</sub> equivalent through the additional forest and tree cover by 2030 as nationally determined contribution (NDCs) under the Paris Agreement.<sup>4</sup>More than 300 million tribal and other forest dwellers in India are either directly or indirectly dependent on the forest lands for their livelihood. The plywood & veneer industry fall under the **Green category** of industries having pollution index score of 21-40 while modular wooden furniture industry falls under the **Orange category** having pollution index score of 40-59.<sup>5</sup>

### 7.7.1 ASSESSMENT OF TIMBER FROM “TREES OUT OF FORESTS” (TOF)

The areas outside the forest, where the extensive plantation of the Eucalyptus and Poplar has been carried out by the farmers on their agricultural land. The additional plantation along the roads, canals, and railway lines come under the outside areas of the

<sup>1</sup><http://fsi.nic.in/isfr2017/isfr-forest-cover-2017.pdf>

<sup>2</sup>The Impact of Forest Industries and Wood Utilization on The Environment, <http://www.fao.org/3/XII/0122-A2.htm>.

<sup>3</sup><http://fsi.nic.in/isfr2017/uttar-pradesh-isfr-2017.pdf>

<sup>4</sup><http://nmhs.org.in/pdf/INDIA%20INDC%20TO%20UNFCCC.pdf>

<sup>5</sup>Industrial Sectors Under Red, Orange, Green and White Categories, [https://cpcb.nic.in/uploads/Latest Final Directions.pdf](https://cpcb.nic.in/uploads/Latest%20Final%20Directions.pdf).

forests. Thus for an accurate assessment of the trees out of forests (TOF) for the effective planning and management, the Forest Department made a request to the Forest Survey of India (FSI), Dehradun for providing the agro-climatic zone wise quantity of wood.

The FSI in the year 2018 conveyed to the Principal Chief Conservator of Forests & Head of Department, about the district wise current growing stock and the annual potential production of timber in Uttar Pradesh. (FCI: 27-176/2006 FI, Dated 8.1.2018). FSI has categorized the state into following 9 Agro-climatic zones. Agro climatic zone wise inventoried and uninventoried total estimated stems, volume & annual potential production of Uttar Pradesh was assessed in the table given below:-

**Table-2: FSI Report on Timber availability in U.P (2018)**

Sl.No.	Agro-climatic Zone	Stems (In No.)	Volume (m <sup>3</sup> )	Annual potential production (m <sup>3</sup> )
1	Mid-Western Plain	1,87,66,544	55,10,895	3,72,528
2	Central Plain	9,13,29,802	2,21,91,049	22,13,399
3	Eastern Plain	3,91,67,308	1,53,19,343	10,48,497
4	North Eastern Plain	1,57,87,831	68,53,830	3,74,429
5	Tarai	5,87,21,537	1,09,19,598	18,96,792
6	Western Plain	3,23,17,821	49,12,419	6,83,156
7	Bundelkhand Zone	98,23,587	45,87,951	2,99,227
8	Central Western Semi Arid Plain	2,80,63,383	63,73,180	7,16,271
9	Vindhyan Zone	54,50,130	27,28,697	1,70,222
<b>G Total</b>		<b>29,94,27,943</b>	<b>7,93,96,962</b>	<b>77,74,521</b>

FSI made it clear that only 41 districts have been inventoried and for the rest 30 districts where inventory was not conducted, the growing stock and ‘Annual Potential Production’ (APP) is predicted on the basis of estimates of Agro-climatic zone in which districts were falling.

### 7.7.2 ASSESSMENT OF TIMBER FROM FOREST SOURCES

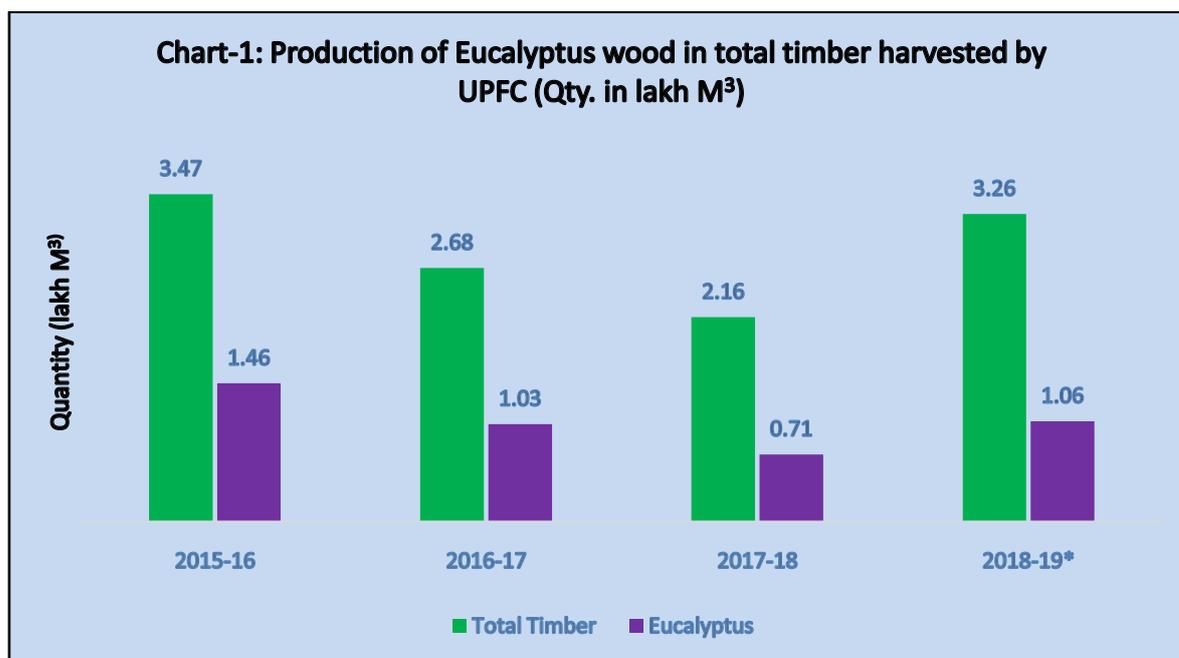
In Uttar Pradesh, U.P. Forest Corporation is the sole government source of the wood and forest produce. The Forest Department has legally made it responsible for removing the dry, dead and diseased trees from the forests as per the approved ‘Forest Management Plans’. Eucalyptus, being an industrial wood is exempted from it and is harvested on its rotation period. The department makes available the lists of such trees to the UP Forest Corporation annually. The process includes cutting, logging, transportation to sales depots and finally selling. In return the corporation pays royalty to the department for the trees given to them.

The quantity of Total timber and apportion of the Eucalyptus wood therein, which has been harvested by U.P. Forest Corporation from the government owned forest areas during last 04 years is shown below:

**Table-3: Contribution of Eucalyptus in total timber production of UPFC**

Financial Year	Total Timber (M <sup>3</sup> )	Eucalyptus Wood (M <sup>3</sup> )	Percentage (%) of Eucalyptus
2015-16	3,46,552	1,45,696	42.04 %
2016-17	2,68,323	1,03,115	38.43 %
2017-18	2,16,149	70,980	32.84 %
2018-19*	3,25,545	1,05,845	32.51 %
Average	2,89,142	1,06,409	36.80 %

\* Un-Audited figures



\* Un-Audited

*Chart 1: Showing the production of Eucalyptus in total timber production*

### 7.7.3 TOTAL TIMBER AVAILABILITY (2018)

The State Level Committee (SLC) thus considered the total availability of wood in the year 2018 for the wood based industries was 80.31 lakh M<sup>3</sup> comprises 77.74 lakh M<sup>3</sup> from outside the forests areas and 2.57 lakh M<sup>3</sup> from the government owned forests.

### 7.8 GRANT OF NEW LICENSES (2018)

On the basis of the above availability of the wood the State Level Committee (SLC) formulated by MOEF decided to issue the new licenses and the up-gradation of the existing

ones. The committee put the entire process on-line, it was done to maintain the transparency, accuracy and to avoid any human interference. All necessary guidelines, rules and conditions were published on the website of the Forest Department. The applications invited were for 8 categories viz: saw-mill, veneer, veneer and plywood, Plywood (Press), stand-alone chipper, MDF/HDF & particle board, MDF/HDF and particle board units. The total number of licenses allotted were 1348<sup>1</sup> including Saw-mills 636, Veneer 90, Veneer & Plywood 76, Plywood (press) 414, Standalone Chipper 119, MDF/HDF & particle Board 8, MDF/HDF 0 and particle board 5 Units,

Source: Website of Forest Department: <https://upfd.in/wbi/>

**Table- 4:Status of the new Licenses issued by the SLC (2018)**

Sl. No.	Category of the Industry	Application received	Payment Made	Eligible for e-lottery	Selected in e-lottery	Letter offered for license	Provisional Licences issued
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	Saw Mills	9696	9130	6203	636	636	615
2	Veneer	2230	1980	1717	90	90	89
3	Veneer + Plywood	1972	1717	1521	76	76	75
4	Plywood (Press)	554	448	414	0	414*	344
5	Stand Alone Chipper	157	127	119	0	119*	83
6	MDF/HDF + particle Board	26	16	13	8	8	6
7	MDF/HDF	13	7	7	0	0	0
8	Particle Board	11	8	7	5	5	3
Total		14659	13433	10001	815	1348	1215

\* Exempted from the lottery system because of non-timber consumption units.

The above data depicts that out of the 1348 successful applicants only 90 % applicants have submitted their acceptance for the offer letter along with the 5 years license fee on-line, which were the basic requirements of the provisional license. The provisional license is not the permission for the operation of the industry, it is allowed only after obtaining the permanent license from Divisional Forest Officer/ Divisional Director concerned. Under the provisional license the applicant can only buy/manage land, plants & machineries for the erection of the unit within the time prescribed for the same.

The consultants observed a resentment among the plywood manufacturers during the field survey, against the process of issuing new licenses to the wood based industries by the

state government, while the existing units are facing the crunch of the raw material. Several groups of industrialists such as ‘Samvit Foundation’, ‘Uday Education & Welfare Trust’ and ‘U.P. Timber Association’ approached the Honb’le National Green Tribunal, New Delhi with the grievance that the state proposes to give above 1215 licenses for new WBIs, which is not viable in view of the limited wood available in the State. The writ petitions have also specifically challenged the availability of the wood as per FSI report dated 8.1.2018. The Honb’le National Green Tribunal vide its orders dated 18th February 2020 have finally quashed the state government notice dated 1.3.2019 for establishing the new wood based industries/saw mills and all provisional licenses given in pursuance thereof. Thus the raw material consumption in the new plywood and veneer units during the study period was ‘zero’, hence the study confined to the current operational plywood & veneer units in Uttar Pradesh.

### 7.9 OPERATIONAL PLYWOOD INDUSTRIES IN U.P.

There are 473 authorized Plywood and Veneer factories working at present who have obtained the licenses from forest department to operate. 170 units were given license for the ‘plywood & veneer’ production, 225 units were allowed to manufacture ‘veneer’ only whereas 78 units were registered under ‘plywood’ manufacturing category. These factories are scattered in 41 districts of Uttar Pradesh. District wise distribution of these units is given in following table.

**Table-5: District wise distribution of Plywood & Veneer/Plywood/Veneer units in U.P.**

**(Unit: in Nos.)**

Sl. No.	District	Legal license holder of Plywood & Veneer Units in U.P.			Total Units
		Plywood & Veneer	Plywood only	Veneer Only	
(1)	(2)	(3)	(4)	(5)	(6)
1	Agra	1	-	-	1
2	Ambedkar Nagar	-	-	2	2
3	Amethi	2	2	3	7
4	Azamgarh	1	-	-	1
5	Bahraich	1	-	2	3
6	Balrampur	2	-	-	2
7	Barabanki	5	1	2	8
8	Bareilly	15	-	16	31
9	Basti	-	-	3	3
10	Bijnore	9	5	1	15

11	Bulandshahar	1	-	-	1
12	Etawah	-	1	-	1
13	Faizabad	3	-	2	5
14	Fathepur	1	-	-	1
15	Gautambudh Nagar	-	2	-	2
16	Ghaziabad	3	6	-	9
17	Gonda	-	-	4	4
18	Gorakhpur	2	3	-	5
19	Hapur	10	2	7	19
20	Hardoi	2	-	18	20
21	Jaunpur	-	2	-	2
22	Kanpur	-	4	-	4
23	Kanpur Dehat	2	-	-	2
24	Varanasi(Ramnagar)	-	2	-	2
25	Kushi nagar	-	-	3	3
26	Lucknow	22	20	19	61
27	Mainpuri	1	-	-	1
28	Meerut	1	-	-	1
29	Moradabad	1	1	3	5
30	Muzaffarnagar	-	-	7	7
31	Kheri	16	4	17	37
32	Raebrareli	10	-	21	31
33	Rampur	23	3	45	71
34	Saharanpur	3	-	-	3
35	Sambhal	1	-	1	2
36	Shahjahanpur	6	-	2	8
37	Shamli	-	-	1	1
38	Sidharthnagar	-	-	5	5
39	Sitapur	23	17	30	70
40	Sultanpur	1	1	10	12
41	Unnao	2	2	1	5
TOTAL		170	78	225	473

□□□

## Chapter-8

### SECONDARY DATA ON KATTHA INDUSTRY

#### 8.1 KHAIR WOOD AVAILABILITY WITH STATE FOREST

Kattha Factories in Uttar Pradesh are not fully dependent on the material provided by the government. Mostly these units procure their raw material from the open market preferably in the shape of semi processed material. Though the State Forest Department is the major producer of Khair wood through the sales depots of U.P. Forest Corporation. The Forest Department marks the Khair trees for felling and provides the list of such marked trees to U.P. Forest Corporation. U.P. Forest Corporation then fells the trees, converts wood into the logs, transport them to its depots and auctions the material on pre fixed dates. Khair timber has very little (1% to 2%) contribution in total timber production as is apparent from the data given in following table:

**Table 6: Percentage of Khair Wood production in total Timber produce during last 04 years by U.P. Forest Corporation**

Sl. No.	Years	Total Timber Production ( M <sup>3</sup> )	Production of Khair Wood (M <sup>3</sup> )	Percentage of Khair Wood (%)
(1)	(2)	(3)	(4)	(5)
1	2015-16	3,46,552	4692	1.35
2	2016-17	2,68,323	3868	1.29
3	2017-18	2,16,149	3475	1.61
4	2018-19	3,25,545	7931*	2.44

*Source: Balance sheet of UPFC; \* Un-Audited figures*

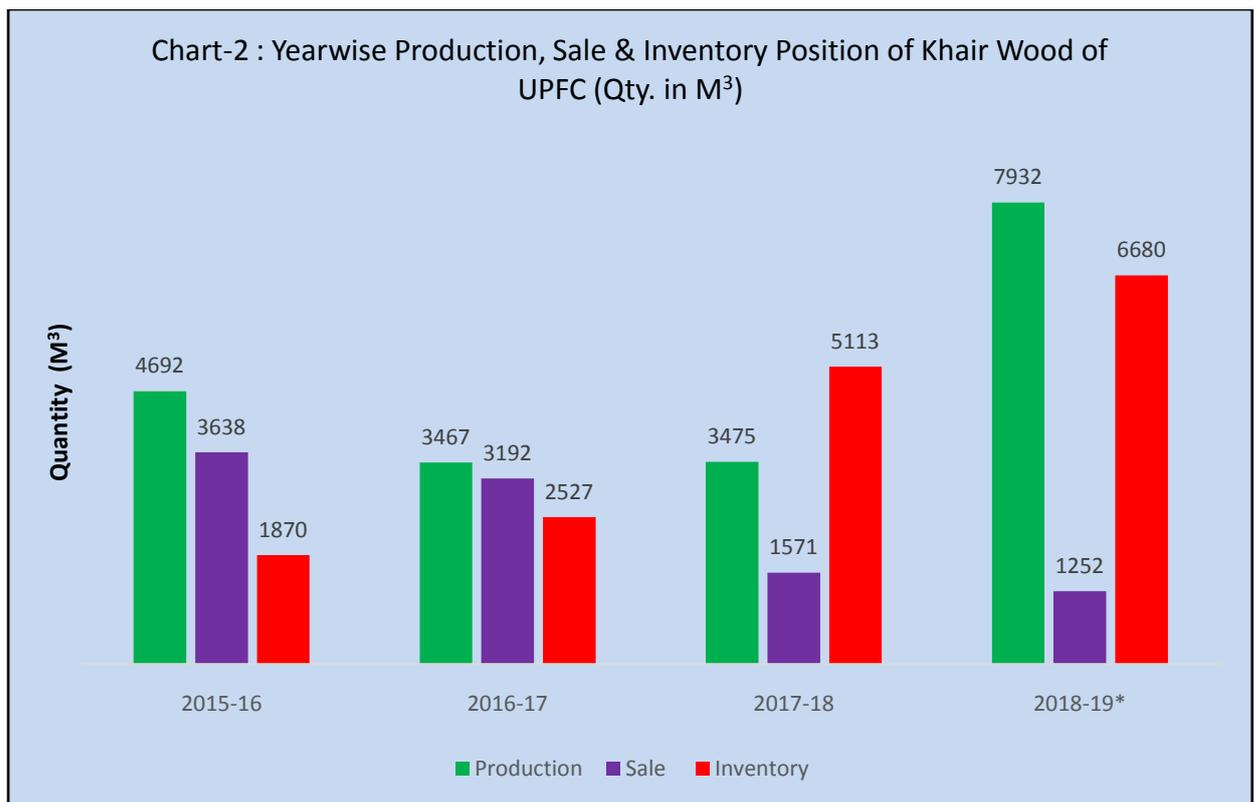
#### 8.1.1 SALES & INVENTORY POSITION OF KHAIR WOOD

On revealing the sale proceeds of Khair Wood shown in following table -7, it was observed that there is down word trend during last 04 years. Only 1252 cubic meter Khair wood could be sold against the total production of 7932 cubic meter harvested during the current year. Whereas 3638 cubic meter Khair wood was sold against the production of 4692 cubic meter in the year 2015-16. Year wise sold quantity, sale price fetched and rates obtained per cubic meter is shown in following table.

**Table -7: Sale quantity, value and average rates of Khair Wood fetched by U.P. Forest Corporation during last 04 years**

Financial Years	Sold Quantity ( M <sup>3</sup> )	Sale Value (Rs.)	Rate Obtained (Rs./M <sup>3</sup> )
(1)	(2)	(3)	(4)
2015-16	3637.9744	107597003	29576
2016-17	3191.8953	169600149	53135
2017-18	1570.9978	99740369	63489
2018-19*	1251.9698	50675305	40476

\* Un-Audited



\* Un- Audited Figures

Chart 2: Showing Production, Sale & Inventory quantity of Khair wood

Above diagram depicts that a decreasing trend is prevailing in the sale of Khair wood during the last four years, resulting that inventory is piling up in the depots of U.P. Forest Corporation. Reason behind this scenario is obvious that Kattha manufacturers have switched over to alternate raw material.

**Table -8: Inventory of Khair wood and its estimated value at the end of the last 04 years**

Financial Year	Quantity of Inventory (M <sup>3</sup> )	Estimates Value of Inventory (Lakh in Rs.)
(1)	(2)	(3)
2015-16	1870.1132	525.63
2016-17	2526.5405	889.31
2017-18	5112.8244	1760.15
2018-19*	6679.9211	2703.76

**8.2 OPERATIONAL KHAIR INDUSTRIES IN U.P.****Table -9: List of the Kattha factories found working in the State**

Sl.No.	District	Name of Kattha Unit	Name of the Owner	Contact No.
(1)	(2)	(3)	(4)	(5)
1	Unnao	1. M/S Upmanyu Kattha Industry, Unnao	Mr. Shishir Awasthi	9839029989
		2. Mark International, Akrapur, Unnao	Mr. Manish Maheshwari	9918131818
		3. M/S Heeral Gramodyog Sansthan, Sahjani, Unnao	Mr. Manoj Kumar Gupta	8052222291
2	Kanpur Nagar	1. M/S Shivam Gramodyog Sansthan, 196 Bhawanipur, Mandhna, Distt.- Kanpur	Mr Samarth Seth, President Mr. Pradeep Jain	9140936449 9415405261
		2. M/S Brijraj Agro Products Pvt. Ltd. Vill.-Dedupur, Chobepur, Distt. – Kanpur-209203	Mr. Raj Kumar Kaya	9839086545
		3. M/S N.K. Laminates Pvt. Ltd., Vill.- Debupur, Sambhalpur, Kanpur	Mr. Manish Chand Jain Mr. S. Srivastav (Mgr)	9935505844 9935508025
		4. M/S Hari Om Gramodyog Sansthan, 54/07, Naya Ganj, Kanpur	Sri Brij Mohan Gupta	9839029000
3	Fatehpur	M/S Tirupati Wood Products G. T. Road, Chaudagra	Mr. Pawan Kumar Agarwal / Lila Dhar	9415052156
4	Bahraich	M/S Awadh Wood Products 12/1, A-1, Gwaltoli, Kanpur	Mr. Vishal Maheswari	9839559515

5	Kanpur (Dehat)	1. Balrampur Products, Raniya, Raipur, Kanpur Dehat	Mr. Hari Kishan Sindhi / Mr. Balram	9935450401
		2. M/S Vee Gee Chemicals Pvt. Ltd. 206 “GA” Raniya Industrial Area, Kanpur Dehat-209304	Mr. Pawan Kumar Agarwal	9415050887
6	Buland Shahar	M/S S S Industries, Malakpur Road	Mr. Abhay Garag	9675791373
7	Bareilly	Indian Wood Products (IWP)	Mr R K Agarwal, CFO	9359102444

The oldest of the 14 industries “M/S Chandra Kattha Industry” at Nazibabad in Bijnore district in Uttar Pradesh is shut down since long due to some administrative reasons. The consultants decided to consider the remaining 13 units. The consultant team conducted several regular interactions with them for obtaining the information through an intensive pre-designed questionnaire.

### 8.3 ALTERNATIVE RAW MATERIAL USED IN KATTHA MANUFACTURING

Most of the Kattha factories which are operational in Kanpur and Unnao districts do not use Khair wood as the main source of raw material. These factories use Khair Liquor (Catechu Extract), Cashew husk (Kaju Chhilka) and Gambier as raw material in Kattha Making.

- 8.3.1 **KHAIR JUICE (CATECHU LIQUOR):** The Catechu Liquor/ Khair Juice is a semi-processed material commonly used in Kattha manufacturing. It is mostly processed in Himachal Pradesh and Ratnagiri district of Maharashtra in India. The Khair juice is also used to cure sore throat and cough. It is easily available in ample quantity around Rs. 100- 125 per kilogram. Some units import it from Nepal. The recovery of Kattha from Khair juice is around 18-20 percent.
- 8.3.2 **CASHEW HUSK:** Cashew Husk is a by-product of the cashew industry derived from the outer cover of cashews and is a truly versatile product used across various industries. India is the largest producer of cashews globally and hence offers a rich supply of good-quality Indian cashew husk. Cashew husk is being procured by Kattha manufacturing units from Kovilam (India) and Vietnam, in form of Pulp (Lugdi). The Rates of Cashew husk are around Rs.10 to 12 per kilogram. Recovery of Kattha from cashew husk is around 6-8 percent.
- 8.3.3 **GAMBIER (UNCARIA GAMBIER):** The third component is ‘Gambier’, which is prohibited in India for food safety reasons. Even Kattha manufacturers use it stealthily

and are in constant apprehension of being caught. The Gambier mainly comes from Indonesia and Malaysia. Its supply is managed through the local agents. The recovery of Kattha from Gambier is ranging from 40–50 percent. That's why it attracts Kattha manufacturers at most.

Ongoing more deep into Gambier, it was brought to the knowledge of consultants that Gambier is an extract derived from the leaves of Uncaria Gambir, a climbing shrub native to tropical south Asia. It is used to cure diarrhoea and dysentery and as a gargle for sore throat. Gambier is also used in the treatment of sciatica and lumbago. Likewise cashew husk and acacia catechu, it is used for dyeing and tanning cotton, wool and silk. It also act as a tanning agent on leather. PL Soni and HW Sharma\* renowned chemical scientist of Forest Research Institute, Dehradun, have found that there were no adverse reports available against the use of Gambier for human consumption, they said Kattha prepared from Uncaria Gambir had more catechin and yield less insoluble and heavy metals than Acacia Catechu. They found it non-toxic and its physico chemical characteristic were considered better that of Khair.

\*[http://timesofindia.indiatimes.com/articleshow/8737978.cms?utm\\_source=contentofinterest&utm\\_medium=text&utm\\_campaign=cppst](http://timesofindia.indiatimes.com/articleshow/8737978.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst)



## Chapter-9

### RESULTS & CONCLUSIONS

#### 9.1 PLYWOOD INDUSTRY ANALYSIS

**Table 10: Descriptive Statistics regarding Year of Initial operation, Quality of wood Difficulties faced in procuring raw material and steps taken**

Description	Veneer N=36	Plywood and Veneer N=28	Plywood N=12
<b>Year of Initial Operation (oldest to latest)</b>	1981 to 2017	1965 to 2017	1979 to 2015
<b>Quality of wood required for production (highest percentage)</b>	Green and fresh (100%)	Green and fresh (66.7%) Green/Dry (25.9%)	-
<b>Difficulties faced in procuring raw material from Govt. source (Highest percentage)</b>	UPFC procedure lengthy (35.0%) Unable to answer (47.2%)	Unable to answer	-
<b>Steps taken for obtaining raw material (Highest percentage)</b>	Encouraging farmers (50.0%) Unable to answer (38.9%)	Unable to answer	-

Regarding the year of initial operation for Veneer, Plywood/Veneer and Plywood manufacturing factories taken in the sample, Veneer manufacturing units were operated initially in 1981 at earliest and upto 2017, Plywood/Veneer manufacturing units were first operated in 1965 and latest upto 2017, and only Plywood manufacturing units were first initiated in 1979 to 2015 with the quality of wood required for the production, all the veneer units required green/fresh (100%) wood whereas Plywood/ Veneer required green/fresh wood (66.7%) and dry wood (25.9%). Regarding the difficulties faced by the factories in getting the raw material from UPFC/Govt. source those who answered (only in Veneer manufacturing units) 35% of them stated that UPFC procedure for sale of wood is very complicated and lengthy causes the wood out of use, further for steps taken in obtaining raw material 50% are encouraging farmers for developing wood for them.

**Table-11: Measurement description of wood required for manufacturing Veneer**

<b>Length/Girth of timber log required for production</b>	<b>Veneer Factories (N=36) {mean± s.e mean (Range)}</b>	<b>Plywood and Veneer Factories (N=28) {mean± s.e mean (Range)}</b>
<b>Minimum length (Mtrs.)</b>	1.06 ± 0.05 (0.45-1.80)	0.93 ± 0.05 (0.30-1.32)
<b>Maximum length(Mtrs.)</b>	1.39 ± 0.07 (1.21-2.43)	1.67±0.12 (1.01-2.99)
<b>Minimum girth (Cm.)</b>	17±1 (03-40)	17 ± 2 (05-40)
<b>Maximum girth (Cm.)</b>	36 ±2 (12-60)	38 ± 3 (12-72)

The purpose of this table is for showing the precise estimation of the size of the logs required by the Veneer and Plywood /Veneer units. The minimum average length of the log for the production of Veneer units is 1.06 meters and standard error of 0.05 meters ranging from 0.45 to 1.82 meters. The maximum average length of the timber log required for the production in the veneer units is 1.39 meters with standard error of 0.07 meters ranging from 1.21 to 2.43 meters while for the plywood/ veneer manufacturing the minimum average length is 0.93 meters with standard error of 0.05 meters ranging from 0.30 to 1.32 meters and maximum average 1.67 meters with standard error of 0.12 ranging from 1.01 to 2.99 meters.

The minimum average girth of a log for the production of veneer units is 17 cm. and standard error of 1 cm ranging from 03 to 40 cm. The maximum average girth of a timber log required for the production in veneer units was 36 cm. with standard error of 2cm. ranging from 12 to 60 cm. while for plywood/ veneer manufacturing the minimum average girth is 17 cm. with standard error of 2 cm. ranging from 5 to 40 cm. and maximum average 38 cm. with standard error of 3 ranging from 12 to 72 cm.

**Table-12: Crosstabulation for source of raw material used by factories  
(Open market v/s UPFC supply)**

Source of raw material in both Veneer/ Plywood and Veneer factories (N=64)		Year		
		2016-17	2017-18	2018-19
Purchase from UPFC (Numbers)	Yes	1 (1.5%)	0	0
	No	63	64	64
Purchase from open market (Numbers)	Yes	64	64	64
	No	0	0	0
Total Respondents (Fisher's Exact Test p-value)		64 (0.000)	64 (0.000)	64 (0.000)

The above table comprises the cross tabulation between the sources of raw material from the open market and UPFC supply. Here we took only Veneer and Plywood/Veneer manufacturing factories for comparison as these factories are directly associated with purchase of wood. They are 64 in total, it revealed that the source of the raw material purchased (wood) by the factories, only one factory purchased wood from UPFC in the year 2016-17 weighing 119 MT with total value of Rs.1.60 lakh, comprise of just 1.5 % and there was no purchase in next two financial years. Major reason behind this ignorance was the very complicated and lengthy procedure of UPFC for sale of timber, on the other hand purchase from the open market was very high. Out of 64 factories all purchased raw material from the open market for the three surveyed years. The percentage difference of the source of raw material was done with the help of fisher's exact test which clearly shows that there is a significant difference (p-value =0.000 for all three years) between the choice of the sources of raw material.

**Table-13: Overall consumption and percentage share (year-wise) of different types of Wood used in Veneer and Plywood/Veneer manufacturing units**

Type of wood	2016-17	2017-18	2018-19
	Wood Consumed in Metric Tons (%)		
Eucalyptus	81894 (58.0)	230531 (65.5)	334872 (63.6)
Poplar	31125 (22.1)	72524 (20.6)	112542 (21.4)
Misc.	28085 (19.9)	48906 (13.9)	78721 (15.0)
<b>Total Wood</b>	141104 (100)	351961 (100)	526135 (100)
Population projection for consumption of wood in Veneer and Plywood/Veneer units N=393			32,68,340 (MT)

It was very important to know the percentage share (pattern) of different types of wood used for veneer manufacturing. The data indicated that out of the overall consumption of the raw material the share of Eucalyptus wood was about 62% and that of Poplar was 22% and rest of them were of miscellaneous category, specifically in 2016-17 consumption of Eucalyptus was 81,894 MT in 2016-17 which increased to 2,30,531 MT and 3,34,872 MT in next two consecutive financial years, in case of poplar the total consumption of 31,125 MT in 2016-17 increased to 72,524 MT and 1,12,542 MT in 2017-18 and 2018-19 respectively, miscellaneous woods were consumed to 28,085 MT in 2016-17 which were increased to 48,906 MT in 2017-18 and 78,721 MT in 2018-19. If we look at the overall consumption of the wood in the industry it comes to 1,41,104 MT in 2016-17 followed by 3,51,961 MT in 2017-18 and 5,26,135 MT in 2018-19. These figures further were used for the consumption of the wood in the total population and also for future estimation of the raw material requirement in near future later in the study. A projection of total consumption of the raw material used for veneer manufacturing is given for the year 2018-19 as 32.68 MT which is almost 5 times higher than the norms set by IPIRTI, Bangalore, a simple calculation may be done as according to IPIRTI, Bangalore a peeling machine can peel around 1500 M<sup>3</sup> or 1363 MT of wood in a year and according to U.P. Forest Department there are 452 machines installed all over the Uttar Pradesh hence the total peeling in state is about 6,16,076 MT annually.

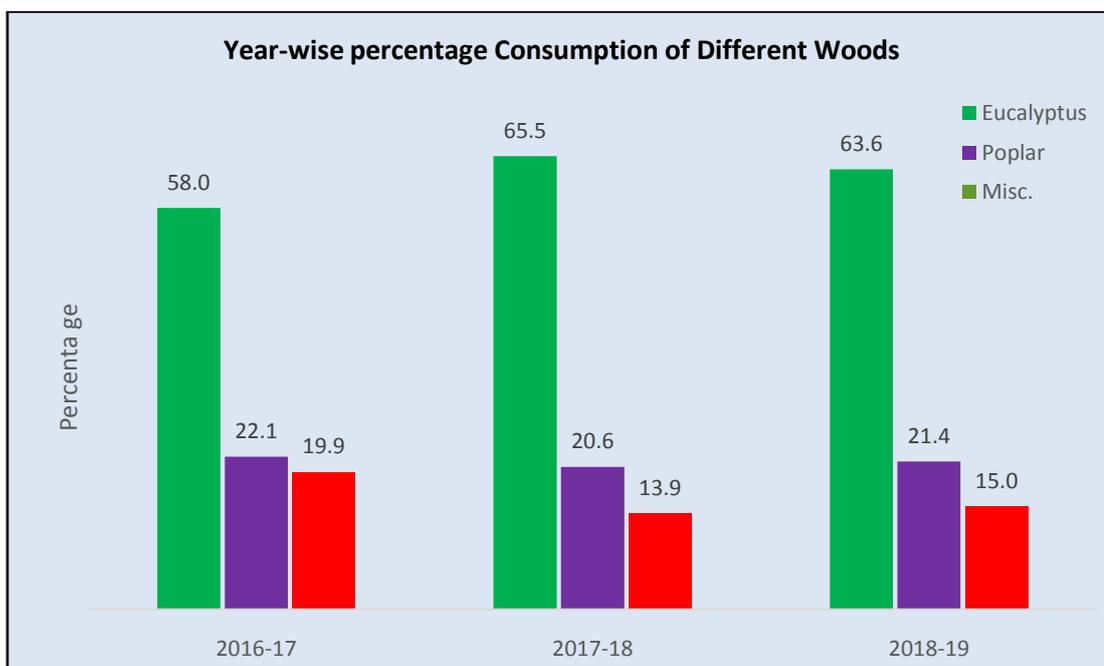


Chart 3: Percentage share of different woods used in veneer manufacturing

**Table-14: Consumption and percentage share (year-wise) of different types of Wood used in Veneer Units N=36**

Type of Wood	2016-17	2017-18	2018-19
	Wood Consumed in Metric Tons (%)		
<b>Eucalyptus</b>	44563 (68.4)	148550 (74.6)	211156 (73.1)
<b>Poplar</b>	17228 (26.5)	40740 (20.4)	63844 (22.1)
<b>Misc.</b>	3324 (5.1)	9916 (5.0)	13978 (4.8)
<b>Total Wood</b>	65115 (100)	199206 (100)	288978 (100)

A similar approach for consumption of different types of wood was made in the veneer manufacturing units and it was found that out of the total consumption of the raw material, 73% Eucalyptus wood while that of the Poplar it was about 22% and miscellaneous wood used was only 5% in the current year. On analyzing the year wise consumption pattern, it is observed that in case of Eucalyptus wood the total consumed quantity was 44,563 MT (68.4% of the total consumed quantity) in the year 2016-17, which increased to 1,48,550 MT (74.6%) in 2017-18 and 2,11,156 MT (73.1%) in the year 2018-19. Looking at the Poplar the total consumption in 2016-17 was 17,228 MT (26.5% of total consumed quantity) which rose to 40,740 MT (20.4%) in 2017-18 and 63,844 MT (22.1%) in the year 2018-19. The total consumption of wood in the veneer manufacturing units was 65,115 MT in 2016-17 1,99,206 MT in 2017-18 and 2,88,978 MT in 2018-19, here we found that in the veneer units the consumption of the miscellaneous wood is very low with only 3324 MT (5.1% of the total wood consumption) in 2016-17, 9916 MT (5.0 % of the total wood consumption) in 2017-18 and 13,978 MT (4.8 % of the total wood consumption) in the year 2018-19.

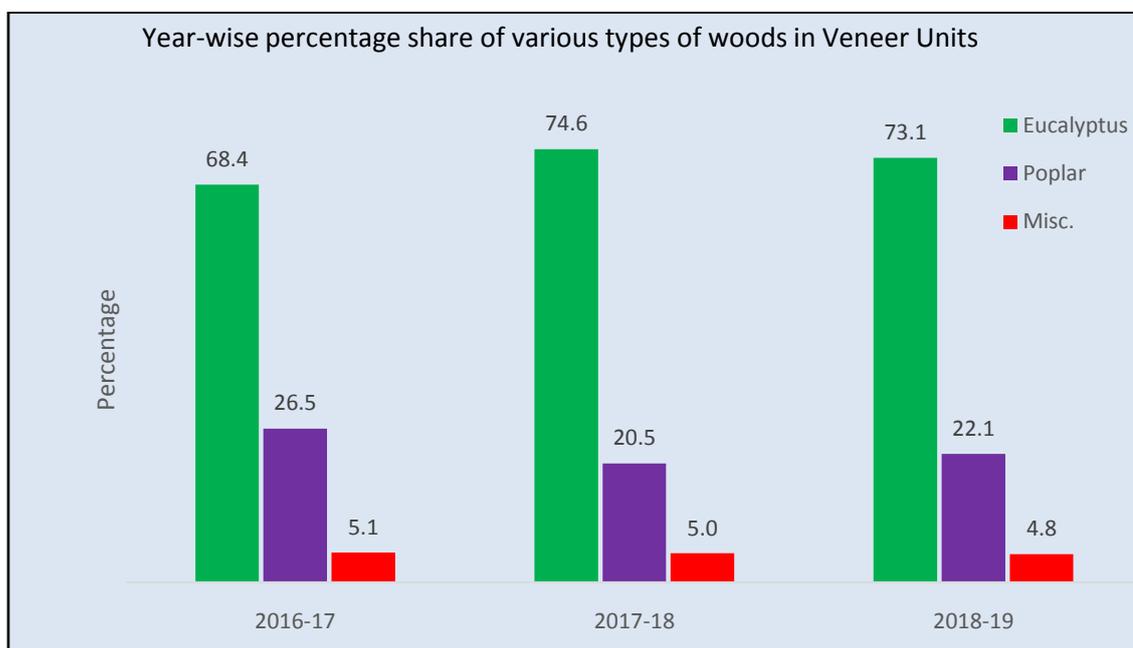


Chart 4: Percentage Share of different wood used by veneer units

**Table-15: Consumption and percentage share (year-wise) of different types of Wood used in Plywood/Veneer Units N=28**

Type of Wood	2016-17	2017-18	2018-19
	Wood Consumed in Metric Tons (%)		
<b>Eucalyptus</b>	37331 (49.1)	81981 (53.7)	123716 (52.2)
<b>Poplar</b>	13897 (18.3)	31784 (20.8)	48698 (20.5)
<b>Misc.</b>	24761 (32.6)	38990 (25.5)	64743 (27.3)
<b>Total Wood</b>	75989 (100)	152755 (100)	237157 (100)

Factories which were involved in the manufacturing of both plywood and veneer, consumed less quantity of the Eucalyptus as compared to the veneer manufacturing units with total amount of 37,331 MT i.e. 49.1 % of the total wood consumed in 2016-17, 81,981 MT (53.7%) in 2017-18 and 1,23,716 MT in 2018-19 i.e. 52.2% of the total wood consumed in these type of factories. Here we may notice that for the plywood and veneer manufacturing factories the consumption of the poplar and miscellaneous wood was a bit high as compared to the veneer manufacturing factories, the consumption the poplar was 13,897 MT (18.3%) in 2016-17, 31,784 MT (20.8%) in 2017-18 and 48,698 MT(20.5%) in 2018-19. For the miscellaneous type of woods the consumption was 24,761 MT (32.6% of total wood consumed) in 2016-17, 38,990 MT (25.5% of total wood consumed) in 2017-18 and 64,743 MT (27.3% of totalwood consumed) in the year 2018-19. The total wood used by these factories was 75,989 MT in 2016-17, 1,52,755 MT in 2017-18 and 2,37,157 MT in the year 2018-19.

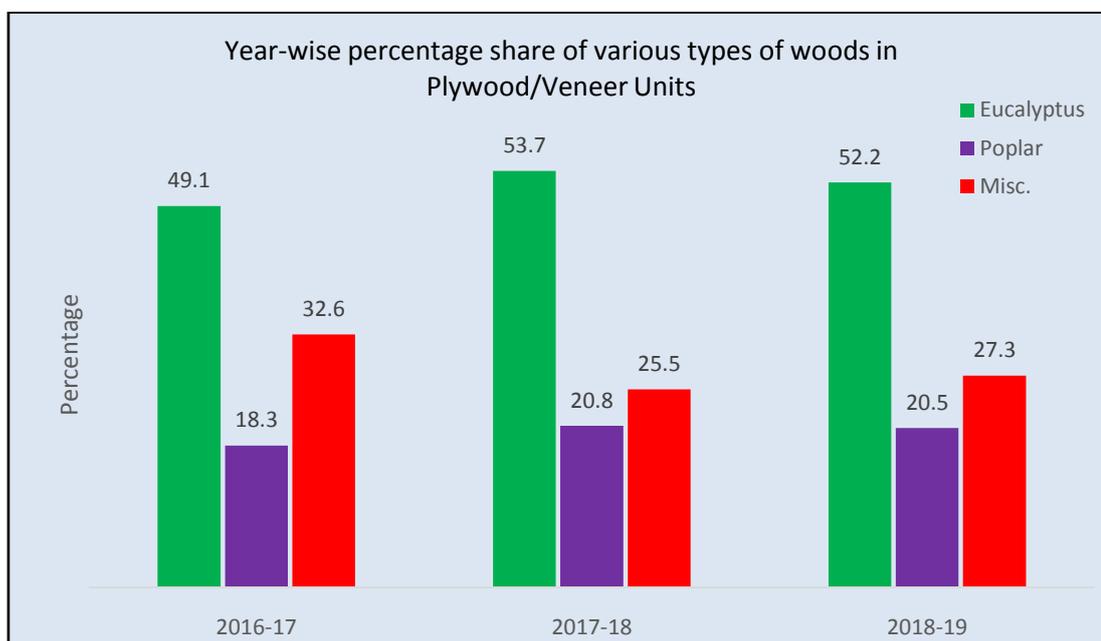


Chart 5: Percentage share of different woods used by plywood & veneer units

**Table-16: Average consumption (Year-wise) of woods in Veneer Factories N=36**

Type of Wood	2016-17	2017-18	2018-19
	Consumption of woods in Metric Tons {mean± s.e mean (Range)}		
<b>Eucalyptus</b>	1238 ± 244 (0-4724)	4126 ± 967 (0-22407)	5865 ± 1774 (0-58683)
<b>Poplar</b>	479 ± 189 (0-4500)	1132 ± 390 (0-10392)	1773 ± 550 (0-12704)
<b>Misc.</b>	92 ± 58 (0-1956)	275 ± 171 (0-5873)	388 ± 199 (0-5187)

To study a population we required a statistics that defines the population parameters. We had to find the population estimates for the veneer manufacturing units which were involved in the direct purchasing of the wood. The data of the average consumption of the raw material and the expenditure incurring there on by each and every unit was very important to know for the population projection. In this table we have described the average consumption of the eucalyptus, poplar and miscellaneous wood species used in the veneer manufacturing factories, the average consumption of the eucalyptus found was 1238 MT in 2016-17, 4126 MT in 2017-18 and 5865 MT in 2018-19. Here we can notice that the range of consumption immensely due to the size of the units. We made survey and found that some of them were very small and some were peeling the wood in big size. In case of the poplar the average consumption was found 479 MT in 2016-17, 1132 MT in 2017-18 and 1773 in 2018-19 similarly for the miscellaneous species it was on an average 92, 275 and 388 metric tons respectively in the three surveyed years

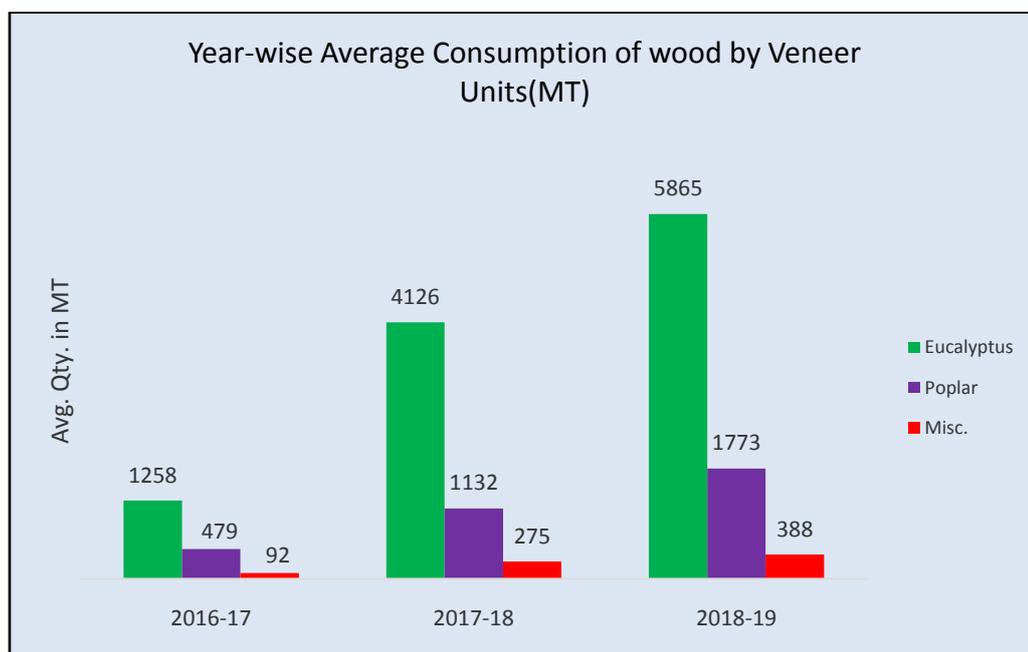


Chart 6: Year wise consumption of wood by veneer units

Table-17: Average expenditure (Year-wise) on woods in veneer Units (N=36)

Type of Wood	2016-17	2017-18	2018-19
	Expenditure on woods in lakh rupees {mean± s.e mean (Range)}		
<b>Eucalyptus</b>	39 ± 8 (0-184)	140 ± 35 (0-771)	194 ± 58 (0-1855)
<b>Poplar</b>	12.89 ± 5.47 (0-135)	31.08 ± 10.73 (0-298.47)	49.27 ± 14.57 (0-320)
<b>Misc.</b>	2.92 ± 1.93 (0-66.63)	7.94 ± 5.40 (0-190.21)	9.30 ± 4.70 (0-127.63)

As far as average expenditure on the raw material is concerned, the expenditure on the eucalyptus wood was Rs. 39 lakh in 2016-17, Rs. 140 lakh in 2017-18 and Rs. 194 lakh in 2018-19 whereas the expenditure on the poplar wood a mounted to Rs. 12.89 lakh in 2016-17, Rs. 31.08 lakh in 2017-18 and Rs. 49.27 lakh in the year 2018-19. Similarly the expenditure incurred by the veneer manufacturing units on the miscellaneous wood was found to be Rs. 2.92 lakh in 2016-17, Rs. 7.94 lakh in 2017-18 and Rs. 9.30 lakh in 2018-19.

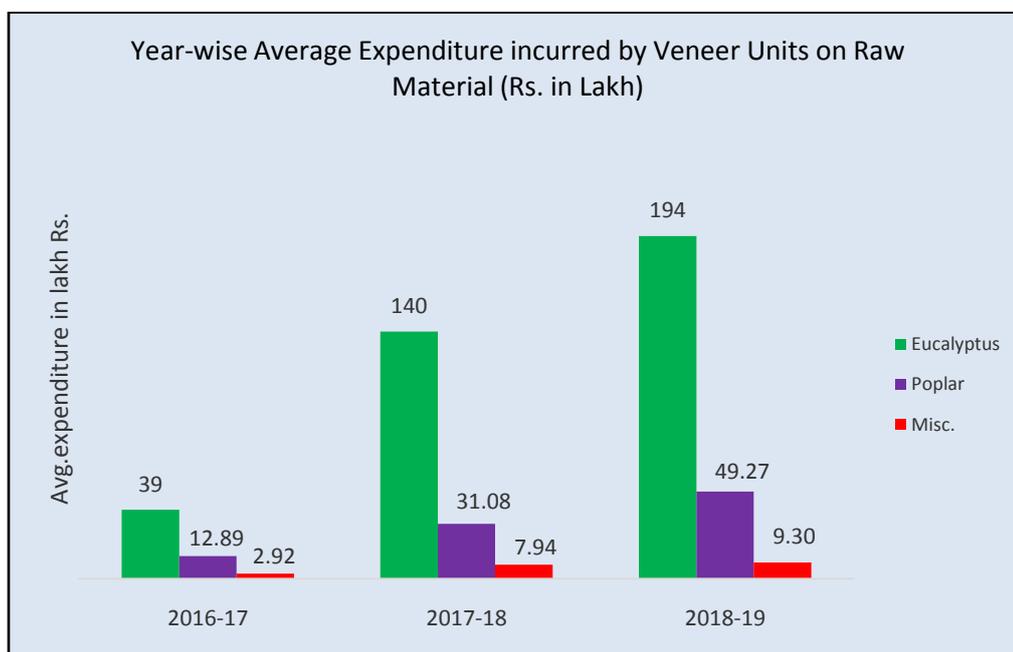


Chart 7: Year wise average expenditure incurred by veneer units on raw material

Table-18: Average rate (Year-wise) on woods incurred by Veneer Units (N=36)

Type of Wood	2016-17	2017-18	2018-19
	Rate of woods Rs./Metric tons {mean± s.e mean (Range)}		
<b>Eucalyptus</b>	3018.85 ± 138.7 (2274.9-4006.5)	3279.75 ± 144.4 (2113.4-4268.2)	3270.54 ± 140.4 (2135-4320.3)
<b>Poplar</b>	2393.78 ± 219.33 (1204-3500)	2751.40 ± 197.7 (2000-4000)	2865.24 ± 203.4 (2036.5-4500)
<b>Miscellaneous</b>	3013.16 ± 165.12 (2598.60-3406.44)	2526.14 ± 191.49 (2155.69-3238.72)	2483.43 ± 150.76 (2043.8-2863.5)

The need for calculation of the rate was felt to ascertain the reliability of the data collected on the consumption and expenditure of the raw material. It may be noted here that the standard error seen in the previous two tables of the consumption of the raw material and the expenditure incurred on it was very high and that might be due to the very big range of the data or might be due to the incorrect data given by the respondents. So we have made a chart of the purchase rates and concluded that the standard error of average rate is very small as compared to the quantity and expenditure incurred on the raw material. Describing the above data, the average purchase rate of the eucalyptus wood was Rs. 3018.85/MT in 2016-17, Rs. 3279.75/MT in 2017-18 and Rs. 3270.54/MT in 2018-19 with standard error of nearly 140 whereas the average rate of poplar wood was Rs. 2393.78/MT in 2016-17, Rs. 2751.40/MT in 2017-18 and Rs. 2865.24/MT in 2018-19 with standard error of nearly 200 and wood of the miscellaneous species was purchased at an average rate of Rs. 3013.16/MT

in 2016-17, Rs. 2526.14/MT in 2017-18 and Rs. 2483.43/MT in the year 2018-19 with standard error less than 200.

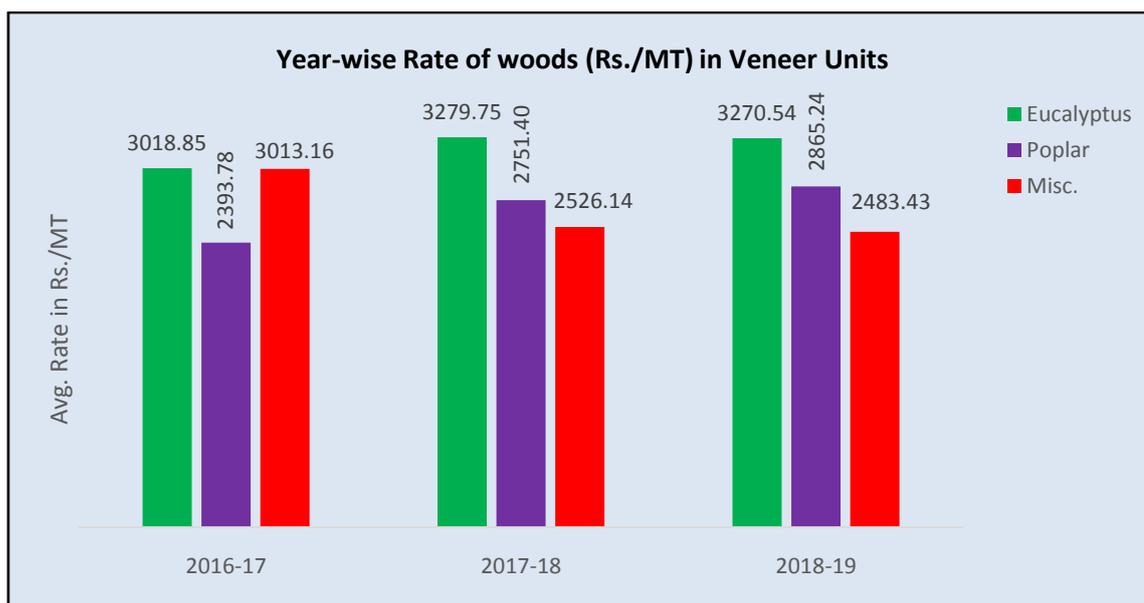


Chart 8: Year wise average rate of wood procured by veneer units

**Table-19: Average consumption (Year-wise) of woods in Plywood & Veneer Units (N=28)**

Type of Wood	2016-17	2017-18	2018-19
	Consumption of woods in Metric Tons {mean± s.e mean (Range)}		
<b>Eucalyptus</b>	1333 ± 382 (0-7437)	2928 ± 1269 (0-31926)	4418 ± 1602 (0-40781)
<b>Poplar</b>	496 ± 215 (0-4851)	1135 ± 356 (0-6006)	1739 ± 643 (0-13974)
<b>Misc.</b>	884 ± 504 (0-13288)	1392 ± 802 (0-20190)	2312 ± 1163 (0-22730)

The above table reveals that the plywood & veneer manufacturing units have higher consumption of the wood of the miscellaneous species in comparison to the poplar wood. It is because of much use of battens in ply board making. It is also observed that the average consumption of the eucalyptus wood in these units was 1333 MT with maximum annual consumption of 7437 MT in the year 2016-17. The average consumption of the eucalyptus wood has increased to 2928 MT in 2017-18 and 4418 MT in 2018-19 with maximum consumption of 31926 MT and 40781 MT per year respectively. As far the Poplar wood is concerned its average consumption was found less than the eucalyptus as 496 MT in 2016-17, 1135 MT in 2017-18 and 1739 MT in 2018-19 with maximum consumption of 4851 MT, 6006 MT and 13974 MT per year during 2016-17, 2017-18 & 2018-19 respectively. The

consumption of the miscellaneous wood was higher than poplar wood with 884 MT in 2016-17, 1392 MT in 2017-18 and 2312 MT in 2018-19 with maximum consumption of 13288 MT, 20190 MT and 22730 MT during the three surveyed years respectively.

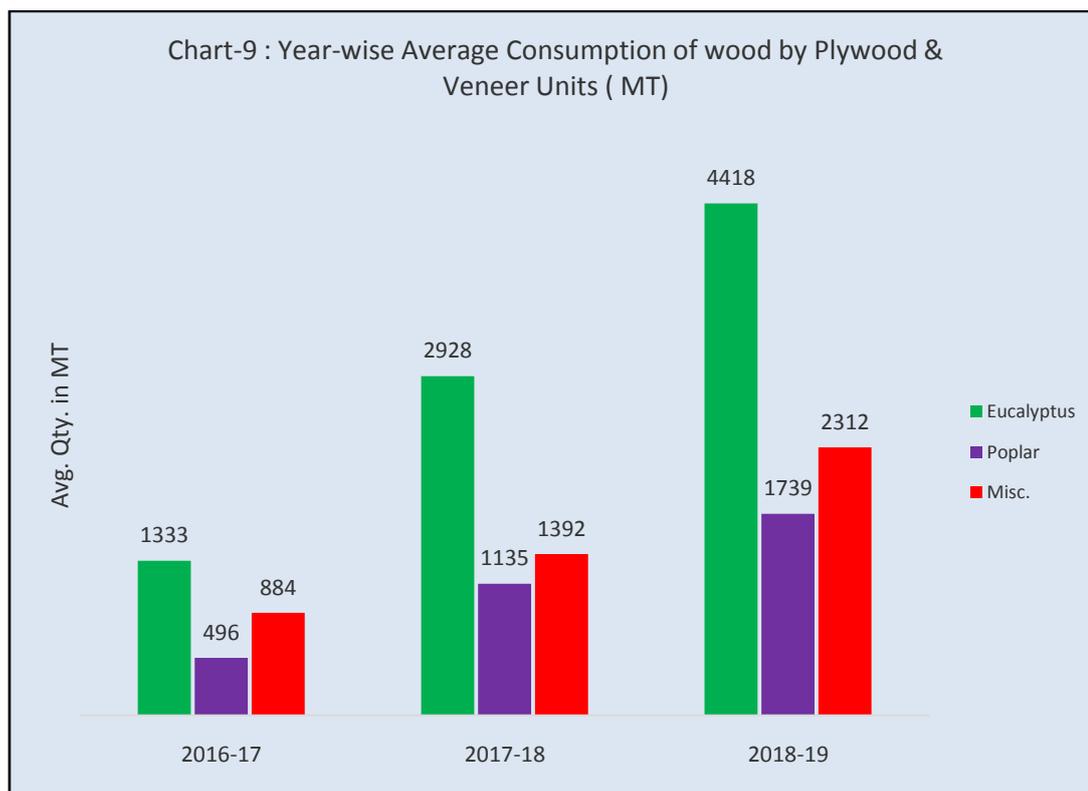


Chart 9: Year wise average consumption of wood under plywood & veneer units

Table-20: Year wise average expenditure on woods by plywood & veneer units (N=28)

Type of Wood	2016-17	2017-18	2018-19
	Expenditure on woods in lakh rupees {mean± s.e mean (Range)}		
<b>Eucalyptus</b>	39 ± 12 (4-228)	93 ± 42 (10-1031)	148 ± 60 (4-1584)
<b>Poplar</b>	11.95 ± 5.07 (6-120.9)	32.65 ± 10.65 (2.20-190.08)	49.43 ± 18.86 (15.15-452.17)
<b>Misc.</b>	15.40 ± 8.86 (8.02-233.55)	38.48 ± 22.67 (2.89-574.87)	64.20 ± 33.12 (0.25-682.00)

Regarding the expenditure incurred on the raw material by the plywood & veneer manufacturing units, the average expenditure on the eucalyptus wood was Rs. 39 lakh with maximum expenditure of Rs. 228 lakh in 2016-17, this expenditure rose to Rs. 93 lakh in 2017-18 and Rs. 148 lakh in 2018-19. Similarly the expenditure on the poplar wood made by these units was on an average of Rs. 11.95 lakh in 2016-17, Rs. 32.65 lakh in 2017-18 and

Rs. 49.93 lakh in 2018-19. Average expenditure for the wood of the miscellaneous species was found high as compared to the poplar with Rs. 15.40 lakh in 2016-17, Rs. 38.48 lakh in 2017-18 and Rs. 64.20 lakh in 2018-19.

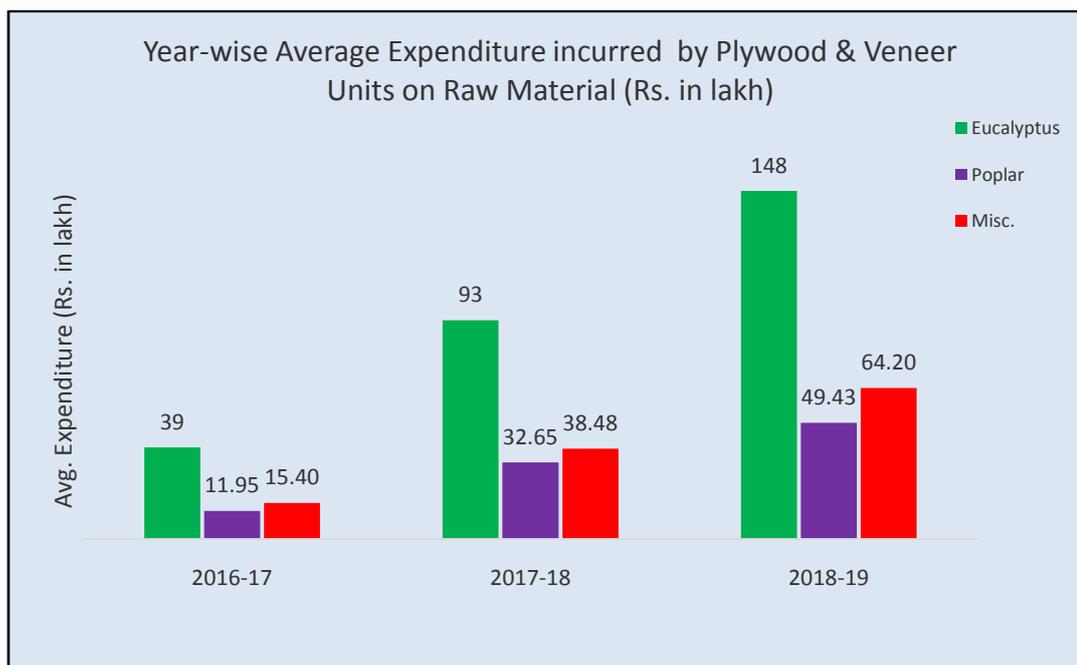


Chart 10: Year wise average expenditure incurred by plywood & veneer units

Table-21: Year wise average rates of raw material borne by Plywood & Veneer Units

Type of Wood	2016-17	2017-18	2018-19
	Rate of woods Rs./Metric tons {mean $\pm$ s.e mean (Range)}		
<b>Eucalyptus</b>	2959.94 $\pm$ 193.55 (1591-4309.5)	2920.65 $\pm$ 119.46 (2086.9-3665.17)	2984.35 $\pm$ 101.1 (2258.8-3884.1)
<b>Poplar</b>	2585.33 $\pm$ 181.13 (1637.76-3103.17)	2741.33 $\pm$ 173.75 (1892.74-4205.31)	3057.58 $\pm$ 255.8 (1883.2-4500)
<b>Misc.</b>	2108.01 $\pm$ 397.71 (488.13-3249.77)	2669.78 $\pm$ 117.81 (2316.55-3000.00)	2596.44 $\pm$ 178.83 (2000-3000)

In this table we observed that the rates of all type of woods are nearly same, specifically the average rate of the eucalyptus was 2959.94 Rs./MT in 2016-17, 2920.65 Rs./MT in 2017-18 and 2984.35 Rs./MT in 2018-19. Average rate of the poplar was 2585.33 Rs./MT in 2016-17, 2741.33 Rs./MT in 2017-18 and 3057.58 Rs./MT in 2018-19. Average rate of the miscellaneous wood was 2108.01 Rs./Mt in 2016-17 increased to 2669.78 Rs./MT in 2017-18 and 2596.44 Rs./MT in 2018-19. It is clearly observed that here the standard error is very low as compared to the respective consumption and expenditure analysis given above, it indicates the validity of the data.

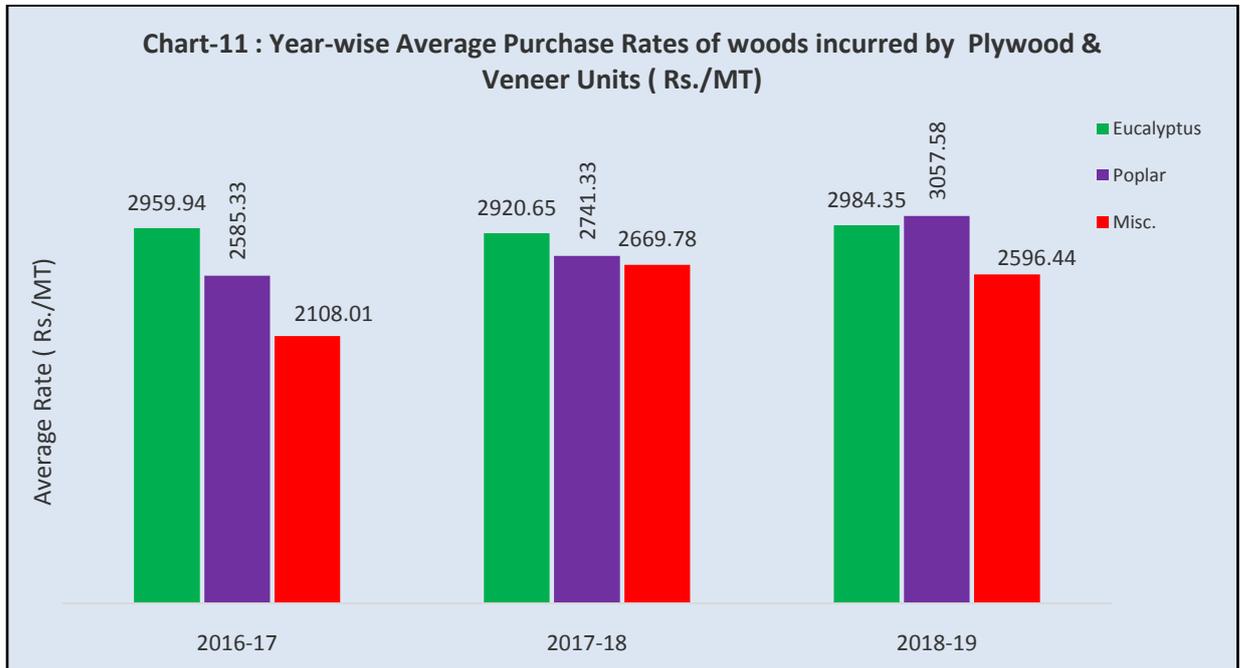


Chart 11: Year wise average purchase rates of wood under plywood & veneer units

**Table-22: Year-wise veneer consumption, expenditure and rate in ‘Plywood & Veneer’ and ‘Plywood’ units (n=40; Population: N=248)**

	2016-17			2017-18			2018-19		
	Mean	Sample Total	Population projection	Mean	Sample Total	Population projection	Mean	Sample Total	Population projection
<b>Quantity (MT)</b>	334348	13373912	79268323	385390	15415596	102876683	524738	20989529	126485043
<b>Value in lakh</b>	26.88	1075.17		32.82	1312.68		49.92	1996.97	
<b>Rate Rs./MT</b>	7.85			9.22			11.42		

The table given above shows the veneer consumption, average expenditure on the veneer and average rate of the veneer borne by the ‘Plywood & Veneer’ and ‘Plywood’ manufacturing units. The average consumption of the veneer was 3,34,348 MT in 2016-17 with total requirement for the whole population i.e. N=248 (Plywood/Veneer and Plywood units) estimated to 7.93 Cr. MT. with the slight increment, the average consumption reached to 3,85,390 MT during 2017-18 and the population requirements increased to 10.28 Cr. MT. The average consumption of the veneer under these units again increased to 5,24,738 MT in the year 2018-19. This was 125% increase in comparison to the last year and obviously the population requirements up to 12.64 Cr. MT.

The average expenditure on veneer purchasing was Rs. 26.88 lakh, Rs. 32.82 lakh, and Rs. 49.92 lakh in the year 2016-17, 2017-18 and 2018-19 respectively. Average rate of the veneer floated to Rs. 7.85 per metric ton, Rs. 9.22 per metric ton and Rs. 11.42 per metric ton, respectively during the three surveyed years. There has been 45% increase in the veneer cost during the last three years.

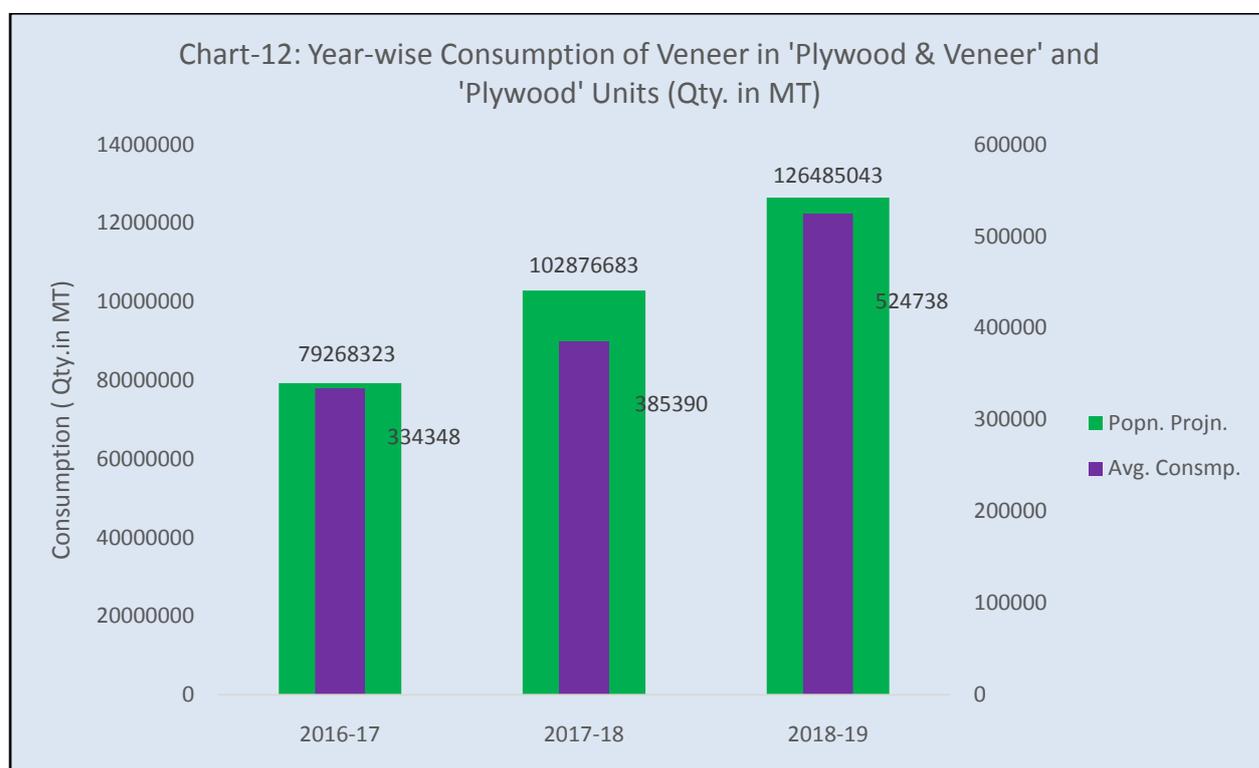


Chart 12: Year wise consumption of veneer under 'plywood & veneer' and 'plywood' units

Table-23: Year-wise Production and Sale of Veneer and Plywood in Industry

	2016-17			2017-18			2018-19		
	Mean	Sample Total	Population Projections	Mean	Sample Total	Population Projections	Mean	Sample Total	Population Projections
Veneer N= 393 (fig. in lakh M <sup>2</sup> )									
Production	5.60	358.79	2370.79	16.30	1043.41	6072.04	24.44	1564.29	9773.30
Sale	5.96	382.04		16.37	1047.92		21.66	1386.73	
Plywood N= 248 (fig. in lakh M <sup>2</sup> )									
Production	2.17	87.03	544.21	3.60	144.34	885.74	4.93	197.20	1227.26
Sale	2.29	91.73		3.91	156.78		5.18	207.49	

Regarding the Production and Sale of the finished products, i.e. the veneer and plywood by the ‘Veneer’ and ‘Plywood & Veneer’ factories there were 393 veneer producing units which produced on an average 5.60 lakh square meters of the veneer in 2016-17. This quantity increased approximately 300% in 2017-18 and the average production of the veneer reached to 16.30 lakh square meters. Again in the year 2018-19 it shot up to 24.44 lakh square meters with the total production estimates for the population amounting to 9773.30 lakh square meters approximately. The 248 plywood manufacturing units produced on an average 2.17 lakh square meters of the plywood during 2016-17 and this average production rose to 3.60 lakh square meters in 2017-18 and 4.93 lakh square meters in 2018-19. The total population production estimates of the plywood amounted to 1227.26 lakh square meters in 2018-19.

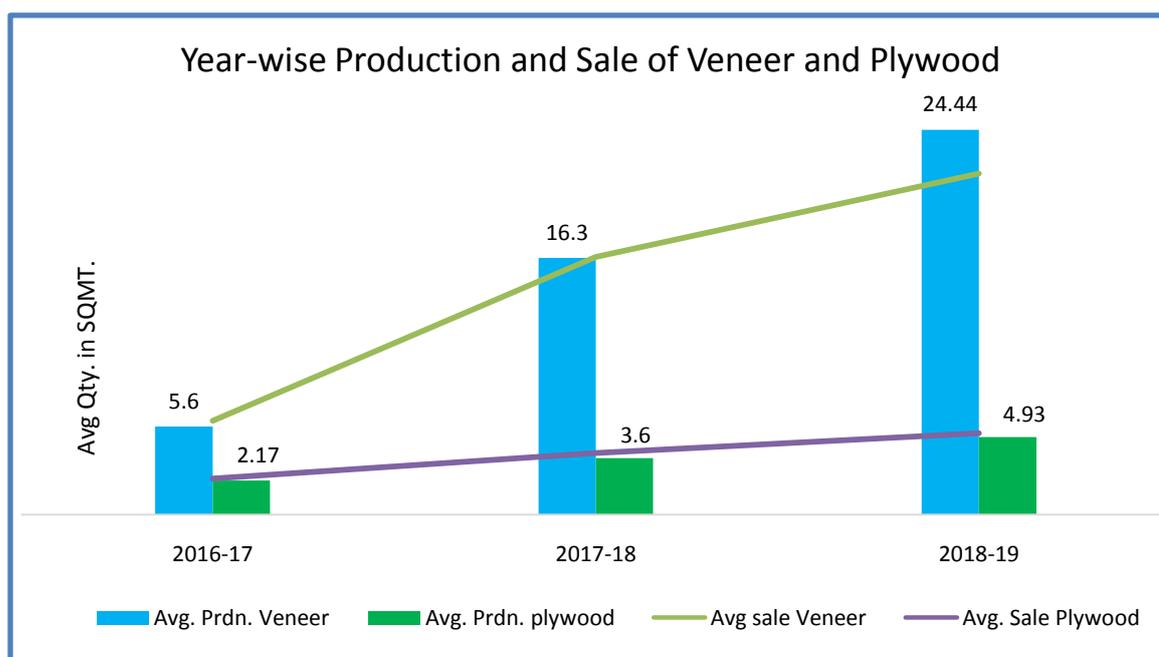


Chart 13: Year wise production and sale of veneer and plywood

Table-24: Year-wise Turnover of Plywood Industry

Type of Unit	2016-17			2017-18			2018-19		
	Mean	Sample Total	Popn. Projn.	Mean	Sample Total	Popn. Projn.	Mean	Sample Total	Popn. Projn.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
<b>Veneer N=36</b>	150.06	4952	33135	255.89	9212	58831	378.46	13625	84526
<b>Plywood and Veneer N=28</b>	470.76	12711	82220	899.33	25181	144824	1216.05	34049	207428
<b>Plywood N=12</b>	201.82	2422	18717	439.97	5280	30054	485.23	5823	41390
<b>Overall Turnover N=76</b>	278.95	20085	113634	522.01	39673	197137	703.90	53497	280641

The above table comprises the information regarding the turnover of the factories involved in the manufacturing of different plywood products. The highest average turnover for the year was found in the factories of the ‘Plywood/Veneer’ category with Rs. 1216.05 lakh/year followed by the ‘Plywood’ category with the average turnover of Rs. 485.23 lakh and then comes the ‘Veneer’ factories with Rs. 378.46 lakh per year. While projecting the population estimates for the turnover the plywood & veneer category remains at the top with Rs. 2,07,428 lakh during the year 2018-19 which is followed by the category of the veneer factories with Rs. 84,526 lakh per annum. The plywood factories with the yearly turnover of Rs. 41390 lakh were at the third position. The overall turnover of all the categories of the plywood industry was Rs. 2806.41 Cr. in the financial year 2018-19. The population estimates in the plywood industry reflects a high growth rate of 250% during the period 2016 to 2019. A projection of the turnover of the plywood industry up to the year 2021 has also been estimated in table-30.

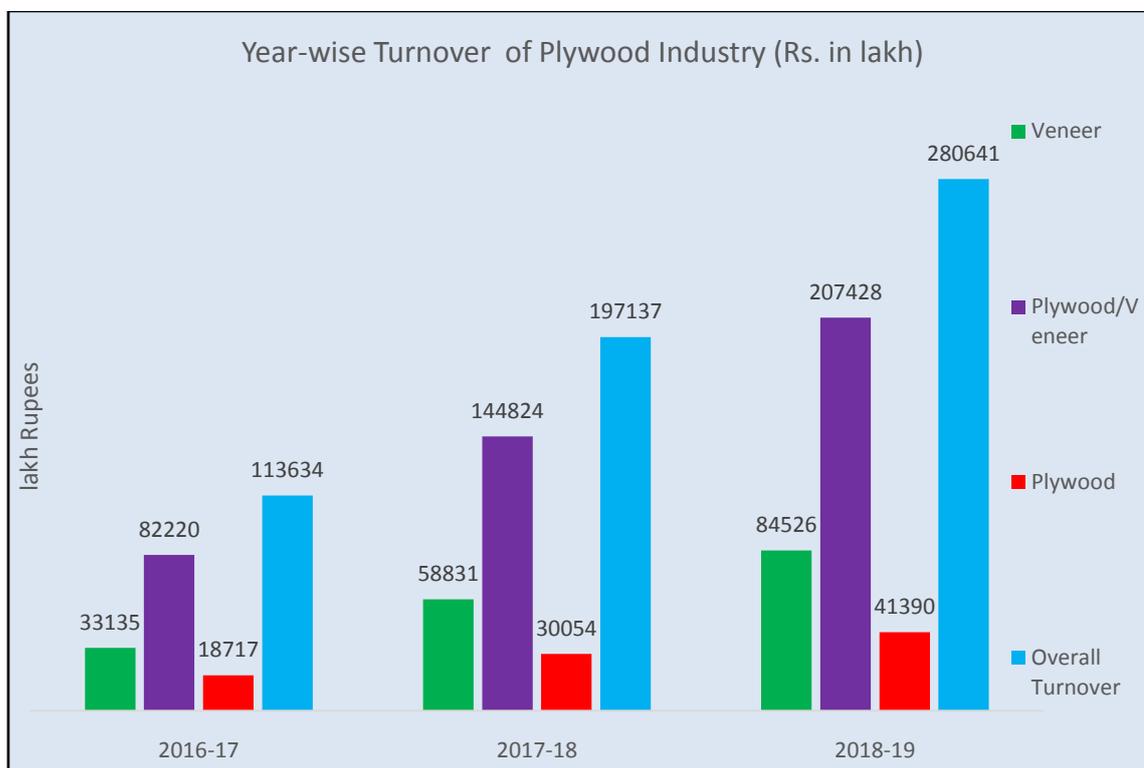
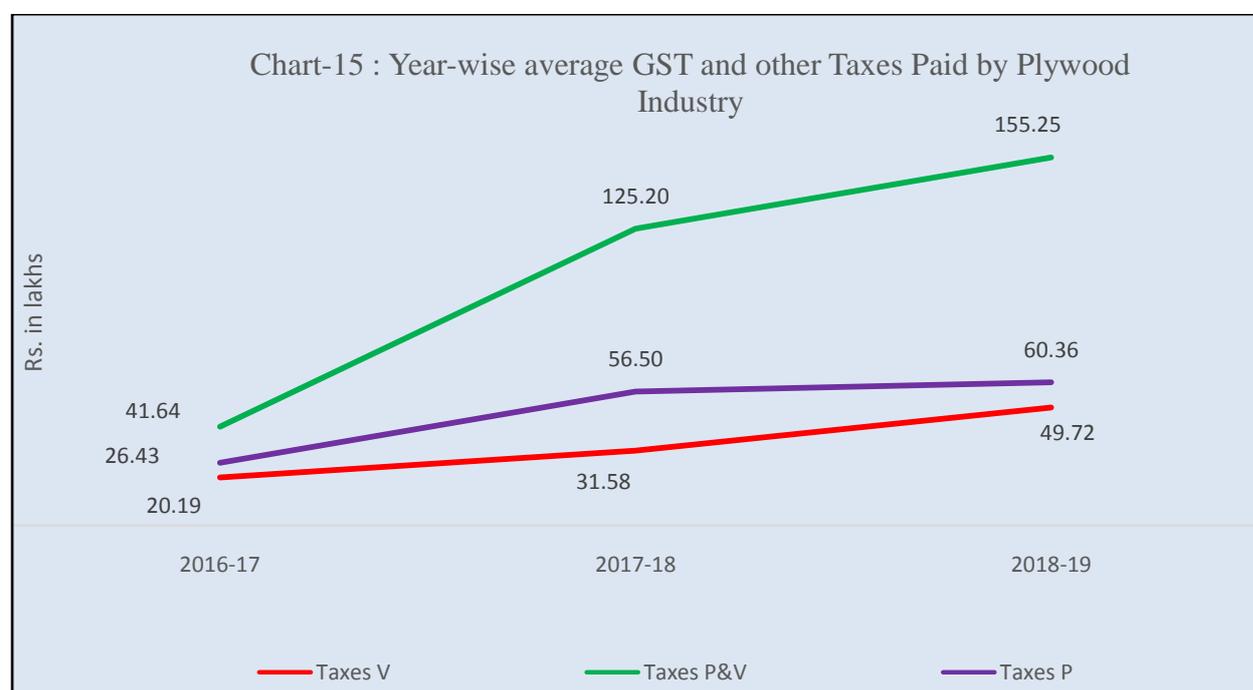


Chart 14: Year wise turnover of plywood industry

**Table-25: Year-wise Tax Generation in plywood industry (Rs. In lakh)**

Type of Unit	2016-17			2017-18			2018-19		
	Mean	Sample Total	Popn. Projn.	Mean	Sample Total	Popn. Projn.	Mean	Sample Total	Popn. Projn.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
<b>Veneer N=36</b>	20.19	666.35	4290.16	31.58	1136.95	7612.20	49.72	1789.98	10934.24
<b>Plywood and Veneer N=28</b>	41.64	1124.21	8493.59	125.20	3505.61	18036.65	155.25	4346.87	27579.72
<b>Plywood N=12</b>	26.43	317.17	2463.92	56.50	678.00	3821.09	60.36	724.32	5178.26
<b>Overall Turnover</b>	29.27	2107.73	15459.72	70.01	5320.56	29887.29	90.28	6861.17	44314.86

As far as the revenue generation by the plywood manufacturing units is concerned, the percentage of the total tax structure on the plywood industry is about 15.79 % of the turnover. The Industry generated about Rs. 443.14 crores revenue during the financial year 2018-19 in form of the GST and other taxes. Specifically the veneer units generated Rs. 42.90 crores of the tax revenue in 2016-17, Rs. 76.12 crores in 2017-18 and Rs. 109.34 crores respectively in 2018-19. The ‘Plywood & Veneer’ units have been generating maximum tax revenue of Rs. 84.93 crores in 2016-17, Rs. 180.37 crores in 2017-18 and Rs. 275.80 crores in 2018-19. The least revenue generating category was of the ‘Plywood’ units with Rs. 24.64 crores in 2016-17, Rs. 38.21 crores in 2017-18 and Rs. 51.78 crores in 2018-19. During the last three years it was observed that the plywood industry is adding about Rs. 150 crores of tax revenue every year.



*Chart 15: Year wise average GST & other Tax revenue generated by plywood industry*

**Table-26: Number of peeling machines installed**

Type of factory	No. of Peeling Machines Installed (percentage)		Population Projection for No. of Peeling Machines (No. of Factories)
Veneer (N= 36)	1	29 (80.6)	181 (181)
	2	4 (11.1)	50 (25)
	3	2 (5.6)	39 (13)
	4	1 (2.8)	24 (6)
<b>Total</b>		<b>47 (100)</b>	<b>294 (225)</b>
Plywood and Veneer (N=28)	1	18 (66.7)	112 (112)
	2	9 (33.3)	112 (56)
<b>Total</b>		<b>36 (100)</b>	<b>224 (168)</b>
<b>Grand Total of Machines</b>		<b>83</b>	<b>518</b>
<b>Forest Data of peeling Machines installed in U.P</b>			<b>452</b>

The data obtained for the 'plant and machinery' reveals that 36 factories which are manufacturing only veneer have 47 peeling machines and most of them (80.6%) depend on the single peeling machine where as 28 sampled 'plywood & veneer' manufacturers have 36 peeling machines installed in their factories, out of which 67% manufacturers depend upon single peeling machine and 33 % have double peeling machines. With the help of the available data, the population estimation for the peeling machines working all over the state was also done. In all 518 peeling machines were estimated in the whole state with 294 machines under the veneer manufacturing units and 224 machines in the plywood & veneer manufacturing units with the average peeling capacity of 5222 m<sup>2</sup>/day under the veneer units and 4252 m<sup>2</sup>/day in the plywood & veneer manufacturing units. The maximum number of machines installed in the veneer unit was 4 and for plywood & veneer units it was 2 machines.

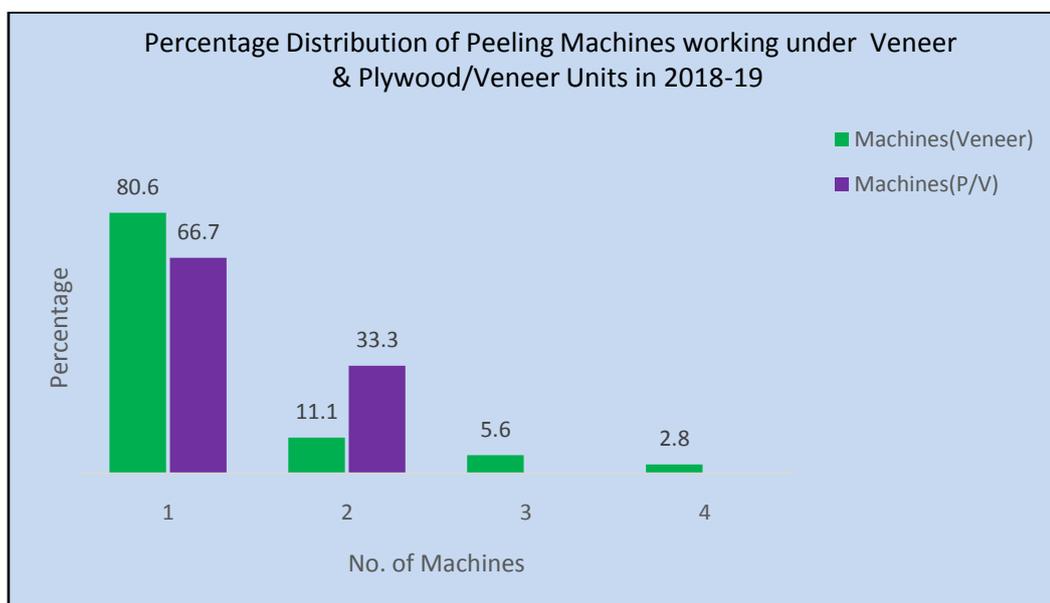


Chart 16: Percentage distribution of peeling machines working under 'veneer' and 'plywood & veneer' units.

Table-27: Number of pressing machines installed and their average capacity of pressing

Type of factory	No. of Pressing Machines Installed (percentage)		Population Projection for No. of Pressing Machines (No. of Factories)
	No. of Machines	Percentage	
Plywood and Veneer (N=28)	1	9 (32.14)	54 (54)
	2	11 (39.28)	132 (66)
	3	6 (21.42)	108 (36)
	4	2 (7.16)	48 (12)
<b>Total</b>	<b>57 (100)</b>	<b>342 (168)</b>	
Plywood (N=12)	1	7 (58.34)	47 (47)
	2	2 (16.66)	26 (13)
	3	2 (16.66)	39 (13)
	4	1 (8.34)	28 (7)
<b>Total</b>	<b>21 (100)</b>	<b>140 (80)</b>	
<b>Grand Total of Machines</b>	<b>78</b>	<b>482</b>	

Pressing machines are used by the 'plywood & veneer' and 'plywood' manufacturing units. Data was collected for the total number of press machines installed under the selected sampled units. The 27 units of the 'plywood & veneer' have 57 pressing machines and 21 'plywood' units were found having 21 pressing machines. The total estimation for the pressing machines all over the state was calculated to 482 machines with 342 machines under the 'plywood & veneer' sector and 140 pressing machines under the 'plywood' category.

Maximum number of machines installed were 4 in both the type of units. The majority of the 'plywood & veneer' units (39.28%) were found working with 2 press machines where as 58.34% 'plywood' factories were working with single press machine.

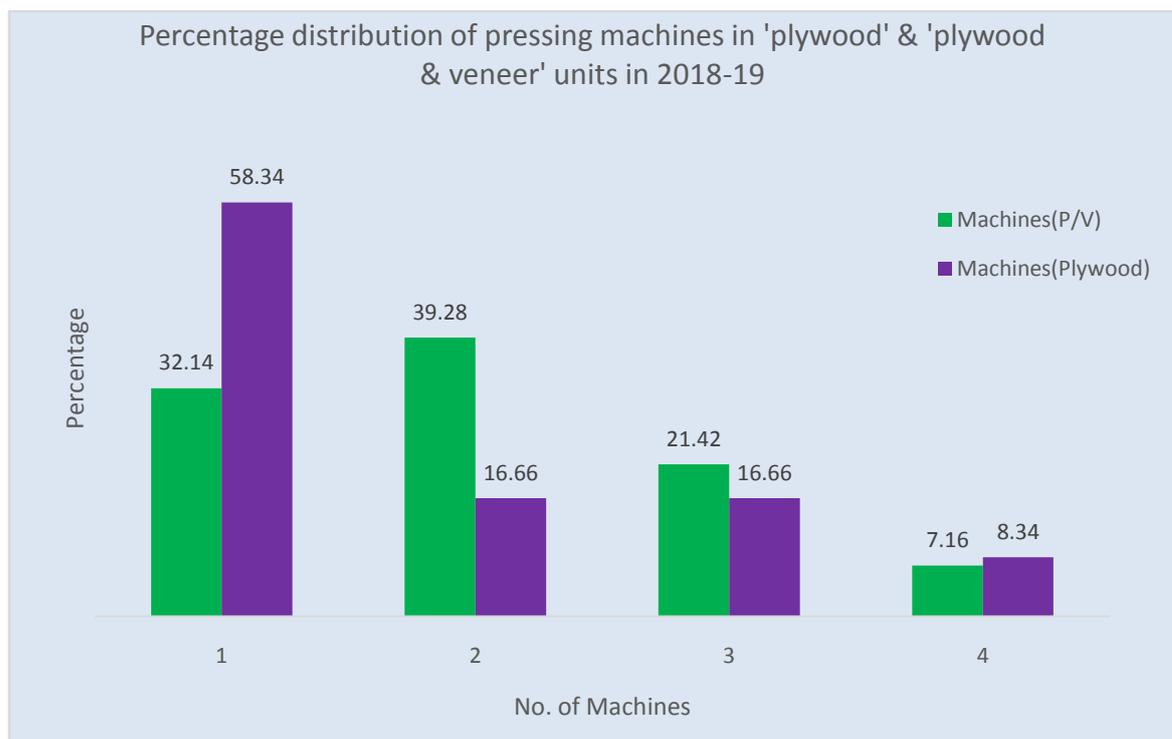


Chart 17: Percentage distribution of pressing machines in 'plywood' and 'plywood & veneer' units.

Table-28: Percentage of skilled/un-skilled manpower and average working hours.

Type of Factory	Average No. of hours factory working per day (Range)	Number of Working Days in a year			Percentage of skilled Labours	Percentage of unskilled Labours
		200-250 (%)	250-300 (%)	300-365 (%)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Veneer	11 (6-20)	19.4	58.3	22.2	33.37	66.63
Plywood and Veneer	12 (6-24)	14.8	74.1	11.1	31.82	68.18
Plywood	10 (6-24)	23.1	69.2	7.7	51.04	49.06

Most of the units in this industry were found working for 250-300 days in a year with 11 hours working on an average in a day. Some of the units were working in single shift whers as some were working in double or triple shifts in a day. Maximum number of the skilled workers (51.04%) were found engaged in the plywood making units followed by 33.37 % in the veneer producing units. The least number of the skilled labours (31.82%) were found working with the plywood & veneer manufacturing industries. The engagement pattern

of the unskilled workers differs slightly with that of the skilled ones. Maximum number of the unskilled labours (68.18%) were engaged in the ‘plywood & veneer’ industry followed by 66.63% in veneer factories and a lesser numbers (49.06%) was found working in the plywood manufacturing units.

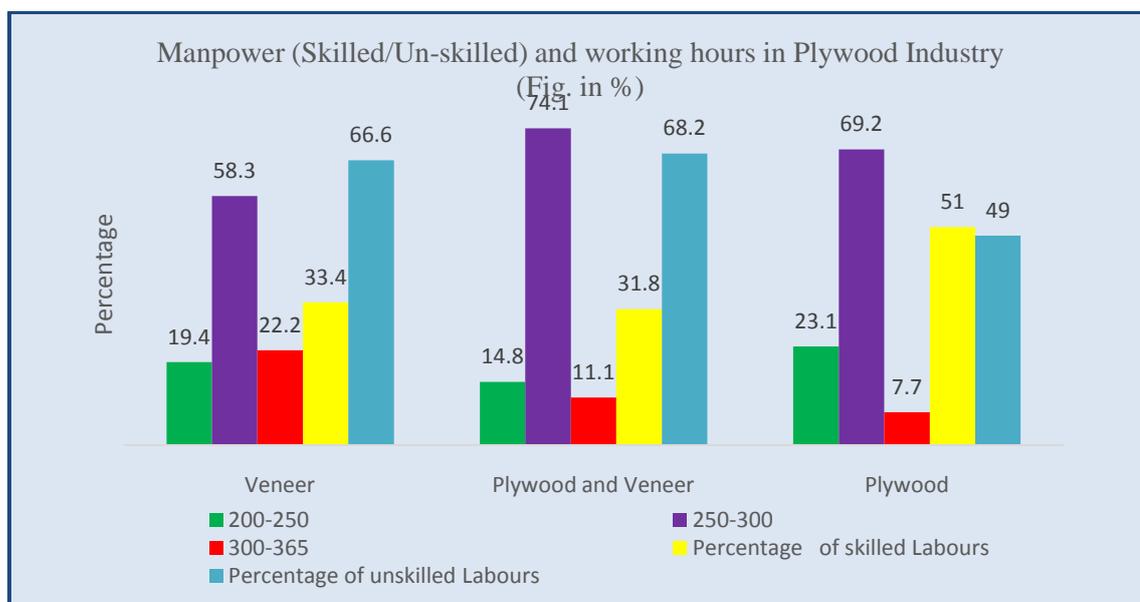


Chart 18: Percentage of skilled/un-skilled manpower and working hours

Table-29: Electricity and Generator Dependency of Plywood Industry

Power Dependency		Veneer	Plywood and Veneer	Plywood
Dependency on electricity	Fully dependent	19.4 %	29.6 %	30.8 %
	Partially dependent	44.4 %	59.3 %	46.2 %
	Not dependent	36.2 %	11.1 %	23.0 %
	Elect. Consumption (Avg. Units)	195890	807815	340643
	Avg. Expenditure (Rs)	1614432	6554126	2722307
	Estimated Population Expenditure (Cr. Rs.)	36.32	110.10	21.77
	Total Expenditure on Power (Cr. Rs.)	168.19		
Dependency on generators	Fully	36.1 %	11.1 %	23.0 %
	Partially	58.3 %	74.1 %	38.5 %
	Not dependent	5.6 %	14.8 %	38.5 %

The regular source of energy, be it through electricity or through DG sets, is an essential requirement for any industrial unit. The dependency on electricity or generator set of the plywood industries has also been included in the study. The data thus obtained and shown in the above table depicts that most of the units were using both the options of power supply.

Maximum number (30.8 %) of the plywood units were found fully dependent on electricity followed by 29.6% and 19.4 % units belonging to the ‘plywood & veneer’ and ‘veneer’ categories respectively. On the other hand generators also played an important role in the power generation. 36.1% the veneer units were found fully dependent on generators followed by 23 % plywood units and 11.1 % ‘plywood & veneer’ manufacturing units. Average expenditure done on power was Rs. 16.14 lakh by the veneer units, Rs. 65.54 lakh by the ‘plywood & veneer’ units and Rs. 27.22 lakh by the ‘plywood’ units. The total electricity expenditure for plywood industry in the state was estimated to Rs. 168.19 Cr. in the year 2018-19.

**Table-30: Future projections on selected parameters for plywood industry (N=473)  
(F.Y. 2016-17 to 2021-22)**

Parameters	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	
	Quantity (in Metric Tons)						
<b>Total Wood Requirement</b>	904010	2086175	3268340	4450506	5632671	6814837	
<b>Eucalyptus</b>	548215	1324936	2101658	2878379	3655101	4431822	
<b>Poplar</b>	192540	442516	692492	942467	1192443	1442418	
<b>Misc. woods</b>	163252	318722	474192	629662	785132	940601	
<b>Veneer Consumption</b>	79268323	102876683	126485043	150093403	173701763	197310123	
<b>Veneer Production</b>	237079756	607204929	977330102	1347455275	1717580448	2087705621	
<b>Plywood Production</b>	54421218	88574100	122726981	156879863	191032745	225185627	
Turnover and Tax Generation (in Lakh Rupees)							
<b>Turnover</b>	<b>Veneer</b>	33135	58831	84526	110222	135917	161613
	<b>P/V</b>	82220	144824	207428	270032	332636	395240
	<b>Plywood</b>	18717	30054	41390	52726	64063	75399
	<b>Overall Turnover</b>	113634	197137	280641	364145	447648	531152
<b>Tax Generation</b>	15459.72	29887.29	44314.86	58742.43	73170.00	87597.57	

This is a self-explanatory table on the projection of the requirement of the timber in the plywood industry, consumption of veneer in the plywood units, total ‘veneer’ and ‘plywood’ production, turnover and revenue generation by the plywood industry in Uttar Pradesh over a period of six years from 2016-17 to 2021-22. The wood required for the plywood Industry in 2018-19 was about 32.68 Lakh MT and is expected to increase up to 44.50 lakh MT in next financial year, 56.32 Lakh MT in 2020-21 and 68.15 lakh MT in the year 2021-22. The requirement of the raw material would be just double the current

consumption in the next three years. The species wise estimation reveals that the eucalyptus consumption alone contributed 21.01 lakh MT in the year 2018-19 as a source of raw material to this industry which would increase up to 44.31 lakh MT in 2021-22. The poplar species which mostly comes from the farmers and is another option available with the industry having the annual consumption of about 6.92 lakh MT in 2018-19 would hopefully increase up to 14.42 Lakh MT. in the year 2021-22. Figures in this table are rough estimates depending on the availability of the raw material which must be taken into account for betterment of the industry.

## 9.2 KATTHA INDUSTRY ANALYSIS

**Table-31: Year-wise raw material purchased by Kattha factories**

Raw Material Details	2016-17	2017-18	2018-19
	Raw Material (Local Purchase)		
Khair Wood (MT)	3273.03	3979.74	4958.58
Value (Lakh rupees)	1219.42	1437.08	1703.33
<b>Avg. Rate (Rupees/Tons)</b>	<b>33637</b>	<b>32799</b>	<b>29877</b>
Khair juice (MT)	1551.2	1422.9	1397.5
Value (Lakh rupees)	1164	1141	993
<b>Avg. Rate (Rupees/Tons)</b>	<b>70206</b>	<b>90318</b>	<b>78348</b>
Raw Material (Imported)			
Cashew Husk (MT)	7217	7955	16635
Value (Lakh rupees)	1199	1626	2847
<b>Avg. Rate (Rupees/Tons)</b>	<b>15236</b>	<b>20445</b>	<b>19239</b>
Gambier (MT)	3043.1	4452.5	7605.5
Value (Lakh rupees)	7789	14540	18041
<b>Avg. Rate (Rupees/Tons)</b>	<b>290420</b>	<b>338312</b>	<b>232226</b>
Forest Purchase (Qty. in Metric Tons)			
Khair Wood (MT)	361.75	873.54	559.25
Value (Lakh rupees)	154.31	415.82	187.80
<b>Avg. Rate (Rupees/Tons)</b>	<b>40952</b>	<b>44150</b>	<b>32194</b>

Information on the actual quantity of the various raw materials purchased by the Kattha factories from the local market, imported from abroad and purchased from the forest department has been given in above table. It is evident from the table that the maximum quantity of the Khair wood is procured by the kattha manufacturing units from the local market. 3273.03 MT raw material was purchased in the year 2016-17, 3979.74 MT in 2017-18 and 4958.58 MT in the year 2018-19. A declining trend was observed in the average rate of the khair wood purchased from the local market, with Rs. 33637/MT in 2016-17 to Rs. 29877/MT in 2018-19. Small quantity of the khair wood purchased from the forest department was 361.75 MT in 2016-17, 873.54 MT in 2017-18 and 559.25MT in the year

2018-19 with an amount of Rs. 154.31 lakh, Rs. 415.82 lakh and Rs. 187.80 lakh respectively during the three study years.

The khair Juice, cashew husk and gambier were also found using as the alternate sources of the khair wood for the kattha manufacturing. Khair juice was found managed at the local level. 1551.2 MT khair juice was purchased in 2016-17, 1422.9 MT in 2017-18 and 1397.5 MT in 2018-19 at the cost of Rs. 1164 lakh, Rs.1141 lakh and Rs. 993 lakh respectively. The cashew husk, an imported raw material played a vital role in the kattha & cutch making. 7217 MT cashew husk valued of Rs. 1199 lakh was bought in 2016-17 which increased to 7955 MT in 2017-18 valued Rs. 1626 lakh and the maximum quantity of 16635 MT cashew husk valued Rs. 2847 lakh was purchased as the raw material in the year 2018-19. Another imported raw material used by the kattha factories has been the ‘gambier’. 7605.5 MT gambier valued Rs. 18041 lakh in the year 2018-19, 4452.5 MT costing Rs. 14540 lakh in the year 2017-18 and 3043.1 MT gambier in the year 2016-17 valued Rs. 7789 lakh was purchased.

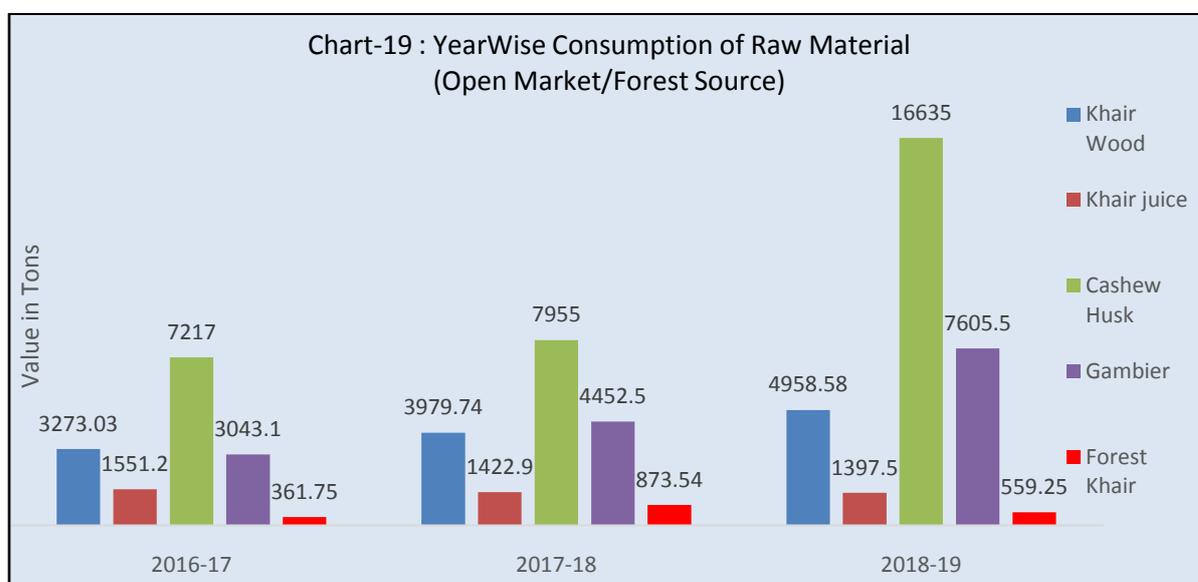


Chart 19: Year wise various raw material purchased by kattha making units.

**Table- 32: Year-wise Production, Sale and Turnover of Khair Industry**

Produce	2016-17	2017-18	2018-19
	Production (MT)		
Kattha	4576	5662	6247
Cutch	3775.15	4407.99	5634.58
Sold Quantity (MT)			
Kattha @ avg. rate 500 Rs./Kg	4486	5376	6075
Cutch @ avg. rate 30 Rs./Kg	3663	4086	5867
Value (Lakh rupees)	17589	26317	28639

The production and sale of the 'kattha' and 'cutch' are nearly the same showing the high demand of the finished product of the Industry. Total production of the 'kattha' in the year 2018-19 was 6247 MT and almost the same amount of 6075 MT was sold out in the same year. Similar situation prevailed during 2016-17 with the sale of 4486 MT kattha against the production of 4576 MT and 5662 MT production verses 5376 MT sale during the year 2017-18. The total manufactured quantity of the 'cutch' was 5634.58 MT in 2018-19 and the sold quantity against this was 5867 MT including the previous year's inventories. The total turnover of the industry was Rs. 28639 lakh in the year 2018-19 which was more than 63 % higher than the turnover of 2016-17.

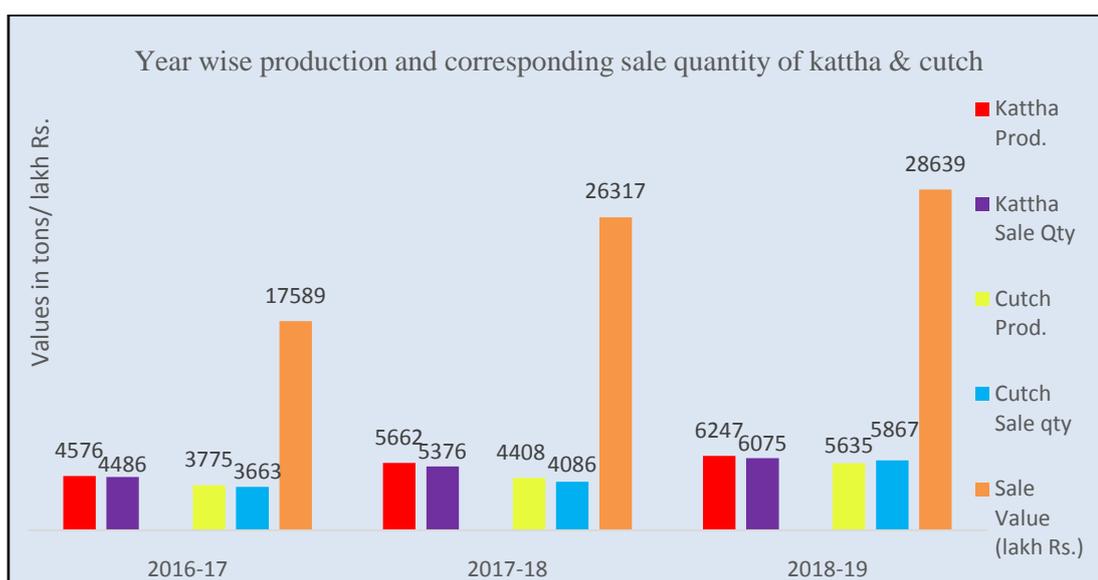


Chart 20: Year wise production and corresponding sale of kattha & cutch

**Table-33: An overview of Khair Industry regarding working days, working hours, labour and power**

Description		Frequency	Percentage
Working days in a year	200-250	6	46.2
	250-300	5	38.5
	300-365	2	15.4
Working Hours	12	1	7.7
	16	3	23.1
	24	4	30.8
	8	5	38.5
Labour Quality	Skilled	197	35.0
	Unskilled	365	65.0
Working during holidays	Fully Close	7	53.8
	Partially Close	6	46.2

<b>Dependency on Electricity</b>	Fully Dependent	6	46.2
	Partially Dependent	7	53.8
	Avg. Elect. Units Consumed	1147582	-
	Avg. Amount Paid(Lakh.Rs.)	89.96 @ 7.83Rs./unit	-
<b>Dependency on generators</b>	Partially Dependent	12	92.3
	Not Dependent	1	7.7
<b>Expected Turnover in next five Years (Lakh Rupees)</b>		32200	-
<b>Quality of wood</b>		<b>Dry</b>	61.6

On reviewing the working conditions of the plywood industry it was observed that the maximum number (46.2%) of units have 200 to 250 working days in a year followed by 38.5 % with 250-300 working days in the year. There were only 15.4 % units which operate for more than 300 days in a year. Regarding the working hours of the industry it was noticed that most of the units observe 8 hr. working in a day and 30.8 % units were found working even for 24 hrs. The industry was found engaged with 65% un-skilled and 35 % skilled workers. When asked about the full holiday during non-working days the team was informed that 53.8 % units remained fully closed whereas 46.2 % revealed that they finish pending works and cleaning activities in the factory during holidays. 53.8% industrial units were found operating on electricity with the back up support of generator sets. Only 46.2% units were fully dependent on electricity. The average expenditure on electricity per unit was found Rs. 89.96 lakh per year at the rate of Rs. 7.83/unit consumption.

### 9.3 CONCLUSION- Plywood Industry

The plywood industry is growing rapidly with swift increase in consumption of the raw material, working capacity and the demand of their finished product in the market where we shall include the major findings of the study based on the information collected as:

- 9.3.1 Quality of the raw material i.e. the timber must be green and fresh for manufacturing of the veneer.
- 9.3.2 Average length of the log used in the industry varied from 1.0 meter to 1.5 meters, as the new machines peel logs of this size only. During the study it was observed that the machine with the capacity of the peeling of 8 feet log are in deplorable condition.

- 9.3.3 Forest Corporation is not able to supply the wood for this industry mainly due to their tedious procedural constraints which forces the industry to purchase their raw material from the open market only.
- 9.3.4 Consumption of the raw material for this industry particularly for the 'veneer' and the 'plywood & veneer' units was about five times (i.e. 32.68 lakh MT) higher in the last financial year 2018-19 against the norms set by IPIRTI Bangalore (about 6.15 lakh MT) with the projection to increase it up to 7 times in 2019-20.
- 9.3.5 Consumption of the raw material for this industry (32.68 lakh MT) was about 2.5 times higher in 2018-19 than the wood available for this industry in 2014 as calculated by CEC (about 13.18 lakh MT).
- 9.3.6 The total production of the 'veneer' in 2018-19 was about 9773.30 lakh square meter and the production of the plywood was 1227.26 lakh square meter in 2018-19.
- 9.3.7 Working capacity of the machine is 5 times higher (about 6309 MT annually) against the norm set by IPIRTI, Bangalore (about 1362 MT annually) and it is 1.5 (about 11.5 Hrs.) times per day than the norms of 8 hours a day.
- 9.3.8 Industry uses about 65% of the unskilled labour for their manufacturing process which allows them to work easily and economically.
- 9.3.9 Power consumption by this industry annually amounts to Rs.168. 19 Cr.with 20.51 Cr. units of the electricity at the rate of Rs. 8.2 per unit, moreover this industry depends almost 50% upon generator for power.
- 9.3.10 Revenue generation by the industry was about Rs. 443. 14 Cr. for the financial year 2018-19 which may increase to Rs. 587.42 Cr. in next financial year.

#### **9.4 CONCLUSION- Kattha (Khair) Industry**

Kattha Factories in Uttar Pradesh are not fully dependent on the material provided by the government. Mostly these units procure their raw material from the open market preferably in the shape of semi processed material. The major findings were as below:

- 9.4.1 The main raw material i.e. Khair wood consumed was 5517.83 metric tons in 2018-19. Out of this only 10% wood (559.25 metric tons) was supplied by Forest Department.
- 9.4.2 In addition to the khair wood, industries also use 'Khair juice, Cashew husk and Gambier' in the manufacturing of the Kattha.
- 9.4.3 The Gambier is being imported from the other countries like Indonesia and Malaysia.
- 9.4.4 Consumption of the Gambier was being done in a very high quantity i.e. 7605.5 metric tons imported from the foreign countries.

- 9.4.5 Due to the high rate of the khair wood from forest department about Rs. 32194 per metric ton in 2018-19 factories are opting for the local market where cheaper khair wood is available at about Rs. 29877 per metric ton.
- 9.4.6 The consumption of the Cashew husk was also very high at 16635 metric ton in 2018-19 at the rate of Rs. 19239 per metric ton.
- 9.4.7 The production of Kattha was about 6247 metric ton and production of Cutch was 5635 metric tons in 2018-19.
- 9.4.8 Keeping the average rate of the Kattha at Rs. 500 per kg. and the Cutch at Rs. 30 per kg.the industry has generated a turnover of about Rs. 286.39 Crores in 2018-19.
- 9.4.9 Each kattha factory consumes about 1.19 lakh units of electricity amounting to the expenditure of Rs. 89.96 lakh per factory.
- 9.4.10 The ratio of the skilled and the unskilled labour came out to be about 3:1



## Chapter-10

# DISCUSSION AND SAGGESTIONS

### 10.1 PLYWOOD INDUSTRY

It was observed during the research that very apparent problems and draw backs exist through out the manufacturing of the plywood. All the problems come with the possibility of solution and the betterment in the existing scenario. The research team found the following difficulties and the suggestions for their eradication.

**10.1.1 Gap in Demand & Supply of the Raw Material:** The research team found an evident imbalance between the demand and supply of the raw material in the plywood industry. The total consumption is 32.68 lakh metric tons against the government allocation of 13.18 lakh metric tons of raw material for the industry. It was much lesser the quantity than the required by the consumers. The plywood industry is fully dependent on the farmer's produce. The material available with the government is insufficient and unsuitable for the industry.

**10.1.2 Raw Material available with UPFC:** U.P. Forest Corporation (UPFC) is the sole provider of the raw material obtained from the government owned forests in the state. It works on the guidelines issued by the state government. The latter provides an annual list of the trees to be removed from the forests. The timber thus received from these trees is transported to the nearest sales depots and then after grading and stacking of the logs it is put-up for sale on the pre-fixed monthly auction dates. This process takes about 60 to 90 days. The main raw material used by the plywood industries is obtained from the trees of the Eucalyptus, Poplar and Softwood species. The U.P. Forest Corporation possesses the eucalyptus timber & small quantity of timber of the softwood species. The poplar comes from the farm forestry, and it is not generally grown in forests. These species have high amount of moisture which dries up very fast after being cut. By the time it is put up for sale by the UPFC, it becomes dry and unsuitable for the plywood & veneer industry. Thus the plywood industries are fully dependent on the farmers' produce. Their purchase takes place from the open market. It is observed that a very insignificant amount of the eucalyptus is purchased from the U.P. Forest Corporation and that too for fuel wood purpose.

The other reasons for not considering the U.P. Forest Corporation's wood as the raw material stated by the respondents during interview are:

1. The complicated paper formalities at the U.P. Forest Corporation level.
2. The prolonged delay in the approvals of the purchased material from the competent authorities
3. The material being sold by volume instead of weight (as preferred by industrialists)
4. The lengths of the logs are not converted as per industry requirements.
5. All transactions are made through banks only.

**10.1.3 Snags faced by the Industry:** The study team observed many difficulties coming in the way of the industry which stop them from working in a peaceful and desired way. The financial pressure felt by the farmers due to the GST and the Mandi Samiti Tax influences adversely the buyers of the material. The farmers grow eucalyptus & popular trees, which are under exempted species for felling. They grow them on the unused land like fences and borders of their fields which gives them an additional income. Hence this crop comes under farms produce. The industry owners continuously demand for the exemption of the Mandi Tax and the GST from these two species like the other farm produces. They also feel that after imposition of the GST on wood, the Mandi Tax is not justified. This is against the “*One Country One Tax*” principle. This might lead the industry to be out from the competitive market and most might be closed. Moreover the growers and the farmers do not use the Mandi yards, they sell it directly to the industry. This way they do not avail any service from the Mandi department. The tax also is not justified. They even quoted examples of Haryana, Uttrakhand & Madhya Pradesh states where there is no Mandi tax on these farmer’s produces. In Uttar Pradesh 18% of the GST in addition to 2.5% Mandi Tax on the eucalyptus & popular wood is creating difficulties for the industry and affecting their production.

**10.1.4 Raw Material filtered to Haryana:** It was observed that Yamuna Nagar, an industrial town of Haryana state, being close and on the border of Uttar Pradesh is drawing most of the raw material of the western Uttar Pradesh. Yamuna Nagar is the biggest hub for the plywood & veneer industry in northern India. On an average 1500-1700 trucks/ tractor trollies of the eucalyptus & poplar wood from all over Haryana, Punjab, Himachal Pradesh and Uttar Pradesh comes to Yamuna Nagar daily. Out of which approximately 300-350 tractor trollies and some other small vehicles per day come from Uttar Pradesh. Assuming a load of 3 to 4.5 metric tons per tractor trolley

and 12–14 metric tons per truck, the estimated quantity which is going to Yamuna nagar amounts to approximately 5 to 6 lakh metric ton per year. This material specifically belongs to western districts of Uttar Pradesh e.g. Muzaffarnagar, Saharanpur, Shamli, Baghpat and Meerut. There is a cut throat competition for the raw material among the industries in Yamuna nagar. There is no restriction on the state trade. The farmers get much better prices for their produce in Yamuna nagar. Moreover, there is no sufficient market of this produce in this area. One paper mill, named Star Paper Mills, Saharanpur and 12 plywood & veneer units in all the 5 western districts do not provide a sufficient market for the farmers' produce.

**10.1.5 Uneven distribution of Industrial Units:** On exploring the district wise distribution of the existing 473 plywood & veneer units, it was found that the western districts of Meerut, Muzaffarnagar, Saharanpur, Baghpat and Shamli have only the 2.5 % units. There are only 4 plywood & veneer units and 8 veneer units, total 12 units which are not sufficient for the entire farmers' produce available in this area. On the basis of the current prevailing average consumption pattern of the raw material of a unit, the western districts need around 80-85 plywood & veneer units.

#### **10.1.6 Problems from Growers prospective**

- (i) The main source of the raw material for the plywood industry in Uttar Pradesh is the Eucalyptus & Poplar. The study reveals that the agriculture sector is making available all the raw material required by the industry. Both the species of the raw material are not considered as agricultural produce which keep the farmers deprived of the necessary benefits of the agriculture crops from these produces. The benefits includes Mandi tax, Support-price, Crop-insurances and Subsidies etc.
- (ii) The farmers grow the Eucalyptus and Poplar trees in their fields with the hope that the income would help them to meet the important expenses like health care, marriages, children education etc. This is the source of an additional income. Ironically they are not helped much in spite of the added hard work and the crop. They are exploited at different levels. Firstly, by the middle man and industries and secondly they cannot cut their trees unless the main crop is harvested. By this time the prices in the market fall and they do not get the real price for their produce. This results in big discouragement to the growers.
- (iii) It is natural for the farmers to borrow money against their agricultural land in the time of need. It is often seen in the condition of the non-payment that their land is

sold or seized. In such a case the exemption from the Mandi Tax is necessary, so that they are motivated for the plantation of these species and get extra income to meet their expenditures. If they grow them, the industrialists will get enough material for their units.

- (iv) There is an apprehension of deterioration in the quality of the produce and soon becoming useless if the trees are not felled at the time of maturity. Consequently the losses of the farmers adversely influence the industrialist as well.
- (v) There is a lack of quality planting material and productive plantation. This happens because of the genetically unimproved seeds used for preparing the planting material. WIMCO, a match company of Bareilly has contributed a lot in this direction under their buy back scheme during 80's. The genetically improved high yielding varieties and clonal planting material of the poplar & eucalyptus are required to be developed.
- (vi) The farmers are bound to sell their produce to the '*middle man*' from their farms only to avoid the exploitation and unnecessary harassment by the police and Mandi officials. These problems deprived them from getting a reasonable price for their produce.

**10.1.7 Lack of Supportive & Motivational Programmes:** The team found the absence of the supportive motivational programmes organized either by the Government or the industries for the growth of the 'Agro-forestry'. Therefore the farmers are not encouraged for plantation and are not able to improve their earnings. The "Vriksh Kray Yogna" of U.P. Forest Corporation remained buried in pages of the book only. There is a dire need of real fruitful implementation of some quality Agro-forestry schemes for maintaining the continuous availability of the raw material for the wood based industries. It's urgently needed otherwise the wood based industries might confront closure forever. Moreover it is the demand of the changing technology as well.

**10.1.8 Real Time Timber Assessment from TOF:** The guidelines issued by MoEF, clearly say that the timber assessment for wood based industries (WBI) should undergo an intensive study preferably in collaboration with the reputed institute or university once in a five year. The Forest Department depends upon the FSI for the timber assessment from trees out of forests (TOF). In the case of 2018, Forest Department requested the FSI for the timber assessment from TOF in May 2016 for the new licenses processed

in December 2018. FSI commenced the work in February 2017 and completed in December 2017. The FSI clarified that only 41 districts were inventoried during this period, whereas the remaining 34 districts, where no inventory was carried out, the estimates were made on the basis of the agro-climatic zone under which the district fell. This did not give the true and legal picture of the availability of the timber. This methodology of convenience adopted by the FSI and acceptance of the report by the Forest Department was the violation of the guidelines which led to dissatisfaction among the already existing industrialists and the entire process was stayed by the NGT.

**10.1.9 Mechanism for Inter-State & International import timber assessment:** The guidelines also suggest that the timber being imported from the other states or internationally should be taken into account while assessing the availability of the timber for the wood based industries. The team did not find any such mechanism developed by the Forest Department while going through the study.

## **10.2 KHAIR INDUSTRY**

**10.2.1 Inadequate Quantity of Khair Wood:** 23 % respondents revealed that U.P. Forest Corporation does not have an adequate quantity of the Khair Wood, moreover they do not have regular supply of the material, hence the kattha industries were forced to switch over to the alternate sources of the raw material.

**10.2.2 Cumbersome selling Process of UPFC:** Another reason for not buying the wood from government department is that its procedure is very cumbersome, the Kattha manufacturers prefer hustle free procurement of the raw material. On the other hand Khair liquor, Cashew husk and Gambier for the Kattha manufacturing are easily available.

**10.2.3 Low Recovery Percent:** The recovery percentage of Uttar Pradesh Khair wood is about 4 to 5 % which is less than the Khair wood of the other states. The recovery of the Kattha from the alternate resources is much more than the Khair wood (Acacia Catechu).

**10.2.4 High Prices of UPFC Material:** Another important reason which puts off the industrialists from buying the raw material from UPFC is its high prices.

**10.2.5 Difficult to Avail Saw Mill License:** After the constitution of CEC/SLC, it is not easy for the industrialists to avail the license for the Saw mill.

**10.2.6 Transit Fee:** The judgement dated 23 Feb. 1999 by the Hon'ble Allahabad High Court in the case of "The Indian Wood Products Co. Pvt. Ltd. v/s State of U.P." says that the factory produced "Kattha" or "Catechu" is a Forest Produce, within the meaning of the Act, and hence it is a 'Forest Produce' as defined under Section 2(4) of the Forest Act. The U.P. Transit of Timber and other Forest Produce Rules, 1978 will be applicable on 'Kattha' or 'Catechu' movement. During the study it was discovered that none other the 'Indian Wood Product Co. Ltd, Bareilly' and 'Tirupati Wood Products, Fathepur' obtained the transit permit for the Kattha movement from the Forest Department.



## **Chapter-11**

### **PROJECT BRIEFING**

#### **11.1 TEAM COMPOSITION & TASK ASSIGNMENT**

Once the assignment was awarded and the formalities were completed, a research team was formed. The Project Director and the Project Coordinator invested their best of the efforts to fulfil the responsibilities they were entrusted with. An Assistant Director and a Project Associate were included in the team. Five Research Investigators having a good experience of the field data collection were engaged. Some of them were already well trained in the field survey & data collection by the Directorate of Economics & Statistics. One Computer Operator was appointed too in the team for the day to day office work. The field team also received immense support from the heads of Economics & Statistics Department, Forest Department and U.P. Forest Corporation who directed their subordinate staff to assist the consultant's team in their work. The team left no stone unturned for completing the project in the stipulated time, taking care that it was done as per the fulfilment of the objectives of the project.

#### **11.2 UTILIZATION OF RELEASED BUDGET**

The consultants have maintained the budget provisions as per the cost summary provided along with the request of proposal. Funds are being utilized as per the budgetary provisions only. The utilization statement of the released is being made available to DES in prescribed format time to time.

#### **11.3 FACILITIES AND SUPPORT RECEIVED FROM DES**

We commenced our ambitious study with immense sincerity, diligence and dedication. The DES stood in full support with us infusing into us the needed zeal and self-confidence. We deliberated, exchanged and consulted the important points with the DES officials at every milestone and received generous cooperation from them. Once the inception report was approved we chalked out a detailed program for the field survey to be carried out as expected. Necessary directions were issued to the DES field staff by the Director to help and cooperate with the team whenever needed. The concerned authorities were generous enough to issue an undertaking letter to the concerned industries with the impression that the information provided by them will be kept confidential and will not be misused at all. The letters were also obtained from the ESD to be delivered to the Head of Department & Principal Chief Conservator, U.P.,

Managing Director, U. P. Forest Corporation and Director Industries, Kanpur requesting them to cooperate with the study team.

#### **11.4 CONCLUDING GRATITUDE**

The RAK Management Consultants feel immensely obligated to Directorate, Economics & Statistics Division, State Planning Institute, U.P. Lucknow for giving the opportunity to work for their prestigious research project on 'Plywood and Kattha Industries' in the state. The constant support, encouragement, appreciation and an understanding attitude rendered by the concerned officers and staff proved very conducive in the completion of our project. It's been a sheer pleasure and memorable experience. The tips and suggestions received from yourself time to time added gravity to our work outcomes. We feel complascent in submitting the report.



**Enclosure 12.1: Questionnaire for field Survey-Plywood Industry**  
**निदेशालय, अर्थ एवं संख्या प्रभाग, राज्य योजना संस्थान, उत्तर प्रदेश, लखनऊ**  
**Directorate, Economics & Statistics Division, State Planning Institute, U.P., Lucknow**

<p>सेवा में  उत्तर प्रदेश की समस्त प्लाईवुड निर्माता कं०</p> <p>प्रिय महोदय/महोदया</p> <p>किसी भी राष्ट्र अथवा राज्य की प्रगति उसकी आर्थिक स्थिति से परिलिखित होती है। राज्य की सही आय के आंकलन हेतु अर्थ एवं संख्या प्रभाग द्वारा समय-समय पर राज्य /आय के अनुमानों के आंकड़े जारी किये जाते हैं। जिन आर्थिक व सामाजिक क्षेत्रों के आधिकारिक आंकड़े उपलब्ध नहीं होते या पर्याप्त आंकड़े नहीं होते हैं, उन क्षेत्रों में अर्थ एवं संख्या प्रभाग द्वारा सर्वे अथवा विशेष अध्ययन कराये जाते हैं। उत्तर प्रदेश के राज्य आय के अनुमानों के सुदृढीकरण की प्रतिपूर्ति के उद्देश्य से प्रदेश की वनाधारित कृषि एवं प्लाईवुड उद्योग की इकाईयों से प्राप्त होने वाले आय के सम्बन्ध में यह अध्ययन मैसर्स रैक मैनेजमेन्ट कन्सलटेन्ट्स, लखनऊ के माध्यम से शासन द्वारा कराया जा रहा है।</p> <p>आपकी इकाई के बारे में आवश्यक सूचनाएं एकत्र करने एवं राज्य की आय में आपकी इकाई का योगदान जानने के लिए मै० रैक मैनेजमेन्ट कन्सलटेन्ट्स, लखनऊ के प्रतिनिधि आपसे सम्पर्क करेंगे। वनाधारित उद्योगों को कच्चे माल की उपलब्धता में आ रही चुनौतिया, सरकार द्वारा किये गए प्रक्रियात्मक सरलीकरण का प्रभाव तथा अन्य आ रही समस्याओं के निराकरण हेतु आपके बहुमूल्य सुझाव जानने के लिए संलग्न-प्रपत्र/प्रश्नोत्तरी तैयार की गई है।</p> <p>आपसे अनुरोध है कि आप निःसंकोच होकर अपनी संस्था की सही-सही सूचना मै० रैक मैनेजमेन्ट कन्सलटेन्ट्स के प्रतिनिधि को उपलब्ध कराने का कष्ट करें। आपके द्वारा उपलब्ध कराई गयी सूचना पूर्णतयः गोपनीय रखी जायेगी, तथा इसका प्रयोग केवल प्रदेश के राज्य आय अनुमानों के आंकलन में एवं आपके उद्योग के भविष्य के लिए उचित रणनीति तैयार करने में किया जायेगा। आपकी सही सूचना का तात्पर्य प्रदेश की सही आर्थिक स्थिति का आंकलन है। अतः सही सूचना दे कर आप अपने प्रदेश की प्रगति में सहभागी बनें।</p> <p align="right">निदेशक</p>	<p>To  All plywood Manufacture Industries of U.P.</p> <p>Dear Sir/Madam</p> <p>The economic health of any State or a country is symbolic of progress/ Growth of a nation or State. The Economics &amp; Statistics Division of State Planning Institute evaluates &amp; upgrades the estimates of State Income on regular basis. DES carries out surveys and conduct studies on such subjects for which official statistics does not exist or data is inadequate on various economic and social subjects for economic planning of the State. The State Govt. has deputed M/S RAK Management Consultants, Lucknow for the study of the income contribution of forest based industries e.g. Kattha and Plywood in the state economy. Its aim is to assimilate the accurate percentage and value and enable the economic growth.</p> <p>In order to collect the important and needed information and your contribution in the State Income, a representative of M/S RAK Management Consultants, Lucknow has been deputed for visiting your industry. A detailed Questionnaire has been prepared to know your valuable suggestions to eradicate the problems and make convenient the challenges posed in the way of forest based raw material for the industry and understand better ease out of business.</p> <p>You are therefore, requested to make available the accurate information to the representative without any apprehension. We assure you that all data and information provided by you will be kept secret. It will solely be used to evaluate the State Income, for the development of your industry and prepare a helpful strategy for a better future.</p> <p align="right">Director</p>
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फील्ड सर्वे – प्रश्नोत्तरी  
Questionnaire for Field Survey

(क)–फैक्ट्री की सामान्य जानकारी (A)- GENERAL DETAILS OF FACTORY			
1	संस्था/फैक्ट्री का नाम Name of Industry		
2	पता Address		
3	जिला / District		
4	स्वामी का नाम/ Name of the Owner		
5	लाइसेन्स नम्बर/वर्ष License No. /Year		
6	क-स्थापना वर्ष/Year of Establishment	ख-पूंजी निवेश (Initial Investment)	रु.
7	कार्य आरम्भ करने का वर्ष Start-up year ( माह/ वर्ष ) / (Month/Year)		
8	सम्पर्क विवरण : फोन न. Contact Details: Phone: मोबाइल न०/Mobile No.  ई-मेल/e-mail		
9	उद्योग का प्रकार Type of Industry	प्लाइवुड एवं विनीयर/ प्लाइवुड/ विनीयर Plywood & Veneer/Plywood/Veneer	
(ख)–कच्चे माल का विवरण (B)-Details of Raw Material			
10	प्लाइवुड में प्रयोग की जा रही प्रकाष्ठ प्रजातिया Wood Species used in plywood	मुख्य प्रजातियां/ Main Species	अन्य मिश्रित प्रजातिया/ Miscellaneous Species

11	प्रयोग की जाने वाली लकड़ी की गुणता (हरी/सूखी/रंग इत्यादि) Quality of Wood used (Green/Dry/Colour etc.)						
12	प्रयोग किये जाने वाले प्रकाष्ठ की नपत/माप Size of the Timber Logs used	लम्बाई(मीटर में)/Length(Mts.)					
		गोलाई (सेन्टीमीटर में)/Girth (c.m.)					
13	क्या आपको पर्याप्त मात्रा में कच्चा माल आसानी से उपलब्ध हो रहा है? Are you getting raw material in adequate quantity easily	हां / नहीं यदि नहीं तो कारण .... Yes/No, If No, specify reasons					
14	कच्चे माल की वार्षिक खपत (प्रजातित्वार विवरण) Yearly Consumption of the Raw material (Species wise)	प्रजाति Species	खुले बाजार / Open Market		उ० प्र० के वनों से / U.P. Forests		
			मात्रा / Qty. (मी. टन) / (MT)	मूल्य / Value (लाख.रू.) / Lakh Rs.	मात्रा / Qty. (मी. टन) / (MT)	मूल्य / Value (लाख.रू.) / Lakh Rs.	
		2016-17					
		यूकेलिप्टस / Eucalyptus					
		पौपलर / Popular					
		मिश्रित / Miscellaneous					
		अन्य / Other(s)					
		2017-18					
		यूकेलिप्टस / Eucalyptus					
		पौपलर / Popular					
		मिश्रित / Miscellaneous					
		अन्य / Other(s)					
		2018-19					
		यूकेलिप्टस / Eucalyptus					
पौपलर / Popular							
मिश्रित / Miscellaneous							
अन्य / Other(s)							
15	क्या आप विदेशों से कच्चे माल का आयात करते हैं? Do you import raw material from abroad?	हां/नहीं Yes/No					
16	यदि उक्त क्रमांक-15 का उत्तर "हां" है, तो विदेशों से माल प्राप्त करने में कठिनाईया / If answer is "Yes" to Sr. no. 15, then specify the problems if facing in it.						

17	विदेशों से आयातित माल की वार्षिक खपत Yearly consumption of imported raw material	विदेशी सामग्री का नाम Name of imported material	विदेशी सामग्री / Imported Material		क्रय किये गये माल का स्रोत Source of Material	देश का नाम Name of Country	
			मात्रा / Qty. (मी. टन) / (MT)	मूल्य / Value (लाख.रू.) / Lakh Rs.			
		2016-17					
		फेस सामग्री / Face					
		पाईन वुड / Pinewood					
		2017-18					
		फेस सामग्री / Face					
		पाईन वुड / Pinewood					
		2018-19					
		फेस सामग्री / Face					
पाईन वुड / Pinewood							
18	क्या आप सरकारी स्रोत/वन निगम से कच्चा माल क्रय करते हैं? Do you procure raw material from Govt. Source/U.P. Forests Corporation?					हाँ / नहीं Yes/No	
19	राजकीय स्रोत अर्थात् उत्तर प्रदेश वनों से कच्चा माल क्रय करने में कठिनाई (यदि कोई हो) / Difficulties faced in procuring the Raw Material from Govt. Source, i.e. U.P. Forests.	1-					
		2-					
		3-					
20	कच्चे माल की आपूर्ति की निरन्तरता बनाए रखने हेतु आपके द्वारा किये गए प्रयास / Action taken by you for sustainable supply of raw material.						
<b>(ग)-उत्पादन विवरण / (C)-Production Details</b>							
21	वार्षिक उत्पादन (इकाई अंकित करें) Yearly Production (Specify Unit)	उत्पाद / Product	2016-17	2017-18	2018-19		

(ध)-विक्रय का विवरण / (D)- Sales Details					
22	विगत 03 वर्षों की बिक्री Sale of last 03 years मात्रा (इकाई अंकित करें) Quantity ( Specify Unit) मूल्य (रु. लाख) Value ( Lakh Rs.)	2016-17	2017-18	2018-19	
(ड.)-संसाधनों की उपलब्धता / (E)- Infrastructure					
23	प्लांट एवं मशीनरी Plant & Machinery	मशीनों के नाम / Name of Machines	संख्या / Quantity	उत्पादन क्षमता / Installed Capacity	देश में निर्मित / विदेश से आयातित Imported/Indian made
		पीलिंग मशीन / Peeling Machine			
		प्रेसिंगमशीन / Pressing Machine (Size : 10, 12 & 20 delights)			
		अन्य / Others			
24	दैनिक कार्य अवधि (घन्टे) Working Hours		शिफ्टों की संख्या / No. of Shifts		
25	औसतन वार्षिक कार्य दिवस Avg. annual working Days	200-250 दिन(Days)/ 250-300 दिन(Days)/ 300-365 दिन(Days)			
26	अवकाश की अवधि में फैक्ट्री में काम की स्थिति Activities in Factory during Holidays	पूर्णतया बन्द रहता है/आंशिक बन्द रहता है/अन्य Fully Close/ Partially Close/Others			
27	विद्युत आपूर्ति पर निर्भरता Dependency on Electricity	पूर्ण निर्भर/आंशिक निर्भर/निर्भर नहीं Fully Dependent/Partially Dependent/ Not Dependent at all.			
28	जनरेटर पर पूर्णतया निर्भर Dependent on Generator Set	हाँ / नहीं / आंशिक Yes / No/ Partially			

29	विद्युत खपत Electricity Consumption	मासिक ..... यूनिट    रु. ....		
		Monthly ..... Units    Rs. ....		
30	विद्युत विभाग से सम्बन्धित कठिनाइयाँ, यदि कोई है Problems with Electricity Department	1.		
		2.		
31	मानव संसाधन-कुशल Man Power – Skilled	कुशल श्रमिकों की संख्या- No. of Skilled Man Power-  आसानी से उपलब्धता- हाँ/नहीं यदि नहीं तो, कारण इंगित करें:  Easily Available - Yes/No If No, specify the reasons:		
32	मानव संसाधन-अकुशल Man Power – Unskilled	अकुशल श्रमिकों की संख्या- No. of Unskilled Man Power -		
33	भारत सरकार की "कौशल विकास योजना" का प्लाईवुड उद्योग पर प्रभाव / Impact of "Kaushal Vikas Yagna" of GOI on Plywood Industry			
<b>(च)-वित्तीय स्थिति / (F)- Financial Status</b>				
34	विगत 03 वर्षों का टर्नओवर (रु. लाख) Turnover of last 03 years	2016-17	आगले 04 वर्ष में टर्नओवर के लक्ष्य Expected Turnover after 4 years	(रु. लाख)
		2017-18		
		2018-19		
35	वर्तमान कुल पूंजी निवेश Total Capital Investment as on date	रु.(करोड़) / Rs. In Cr.		

36	कुल वार्षिक व्यय Yearly Expenditure	2016-17	रु. / Rs.	
		2017-18	रु. / Rs.	
		2018-19	रु. / Rs.	
37	वार्षिक कर देयता / Yearly Tax Component	वर्ष / Year	जी. एस.टी. / वाणिज्यिक कर GST/Com. Tax	आय कर / I.Tax
		2016-17 (रु. / Rs.)		
		2017-18 (रु. / Rs.)		
		2018-19 (रु. / Rs.)		
<b>(छ)–सामान्य सुझाव / (G)- Suggestions</b>				
38	सरकार की संशोधित उद्योग नीति का आपके उद्योग पर प्रभाव व सुधार हेतु आपके सुझाव / Effect of revised government Industrial Policy on your Industry & suggestions for improvement.			
39	सूचना उपलब्ध कराने वाले व्यक्ति का विवरण / Details of respondent	नाम / Name – पद नाम / Designation – मोबाइल नम्बर / Mobile No.–		

Date : .....

अन्वेषक का नाम व हस्ताक्षर  
Name & Signature of Investigator



## RAK MANAGEMENT CONSULTANTS

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## Enclosure 12.2: Questionnaire for field Survey-Kattha (Khair) Industry

उत्तर प्रदेश सरकार

निदेशालय, अर्थ एवं संख्या प्रभाग, राज्य योजना संस्थान, उत्तर प्रदेश, लखनऊ  
(Directorate, Economics & Statistics Division, State Planning Institute, U.P., Lucknow)

<p>सेवा में समस्त कत्था निर्माता कं०, उत्तर प्रदेश।</p> <p>प्रिय महोदय</p> <p>किसी भी राष्ट्र अथवा राज्य की प्रगति उसकी आर्थिक स्थिति से परिलक्षित होती है। राज्य की सही आय के आंकलन हेतु अर्थ एवं संख्या प्रभाग द्वारा समय-समय पर राज्य/आय के अनुमानों के आंकड़े जारी किये जाते हैं। जिन आर्थिक व सामाजिक क्षेत्रों के आधिकारिक आंकड़े उपलब्ध नहीं होते या पर्याप्त आंकड़े नहीं होते हैं, उन क्षेत्रों में अर्थ एवं संख्या प्रभाग द्वारा सर्वे अथवा विशेष अध्ययन कराये जाते हैं। उत्तर प्रदेश के राज्य आय के अनुमानों के सुदृढीकरण की प्रतिपूर्ति के उद्देश्य से प्रदेश की वनाधारित कत्था एवं प्लाईवुड उद्योग की इकाईयों से प्राप्त होने वाली आय के सम्बन्ध में यह अध्ययन <b>मै० रैक मैनेजमेन्ट कन्सलटेन्ट्स, लखनऊ</b> के माध्यम से शासन द्वारा कराया जा रहा है।</p> <p>आपकी इकाई के बारे में आवश्यक सूचनाएं एकत्र करने एवं राज्य की आय में आपकी इकाई का योगदान जानने के लिए मै० रैक मैनेजमेन्ट कन्सलटेन्ट्स, लखनऊ के प्रतिनिधि आपसे सम्पर्क करेंगे। वनाधारित उद्योगों को कच्चे माल की उपलब्धता में आ रही चुनौतिया, सरकार द्वारा किये गए प्रक्रियात्मक सरलीकरण का प्रभाव तथा अन्य आ रही समस्याओं के निराकरण हेतु आपके बहुमूल्य सुझाव जानने के लिए संलग्न-प्रपत्र/प्रश्नोत्तरी तैयार की गई है।</p> <p>आपसे अनुरोध है कि आप निःसंकोच होकर अपनी संस्था की सही-सही सूचना <b>मै० रैक मैनेजमेन्ट कन्सलटेन्ट्स</b> के प्रतिनिधि को उपलब्ध कराने का कष्ट करें। आपके द्वारा उपलब्ध कराई गयी सूचना पूर्णतयः गोपनीय रखी जायेगी, तथा इसका प्रयोग केवल प्रदेश के राज्य आय अनुमानों के आंकलन में एवं आपके उद्योग के भविष्य के लिए उचित रणनीति तैयार करने में किया जायेगा। आपकी सही सूचना का तात्पर्य प्रदेश की सही आर्थिक स्थिति का आंकलन है। अतः सही सूचना दे कर आप अपने प्रदेश की प्रगति में सहभागी बने।</p> <p>निदेशक</p>	<p>To All Kattha Manufacturing Industries of U.P.</p> <p>Dear Sir</p> <p>The economic health of any State or a country is symbolic of progress/ Growth of a nation or State. The Economics &amp; Statistics Division of State Planning Institute evaluates &amp; upgrades the estimates of State Income on regular basis. DES carries out surveys and conduct studies on such subjects for which official statistics does not exist or data is inadequate on various economic and social subjects for economic planning of the State. The State Govt. has deputed M/S RAK Management Consultants, Lucknow for the study of the income contribution of forest based industries e.g. Kattha and Plywood in the state economy. Its aim is to assimilate the accurate percentage and value and enable the economic growth.</p> <p>In order to collect the important and needed information and your contribution in the State Income, a representative of M/S RAK Management Consultants, Lucknow has been deputed for visiting your industry. A detailed Questionnaire has been prepared to know your valuable suggestions to eradicate the problems and make convenient the challenges posed in the way of forest based raw material for the industry and understand better ease out of business.</p> <p>You are therefore, requested to make available the accurate information to the representative without any apprehension. We assure you that all data and information provided by you will be kept secret. It will solely be used to evaluate the State Income, for the development of your industry and prepare a helpful strategy for a better future.</p> <p>Director</p>
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**फील्ड सर्वे – प्रश्नोत्तरी**  
**Questionnaire for Field Survey**

(क)–फैक्ट्री की सामान्य जानकारी (A)- GENERAL DETAILS OF FACTORY			
1	संस्था/फैक्ट्री का नाम Name of Industry		
2	पता Address		
3	जिला / District		
4	स्वामी का नाम/ Name of the Owner		
5	लाइसेन्स नम्बर/वर्ष License No. /Year		
6	क-स्थापना वर्ष/ Year of Establishment	ख-पूंजी निवेश/ Initial Investment	रु./Rs.
7	कार्य आरम्भ करने का वर्ष Start-up year (माह/वर्ष)/ (Month/Year)		
8	सम्पर्क विवरण : नाम /Contact Details: Name: मोबाइल न0 /Mobile No. ई-मेल /e-mail		
9	उद्योग का प्रकार Type of Industry	कत्था निर्माता/कत्था व कच्चा Kattha Manufacturing / Kattha & Cutch	
(ख)–कच्चे माल का विवरण (B)-Details of Raw Material			
10	कत्थाउत्पादन में पयोग किया जा रहा कच्चा माल /Material used in Kattha Manufacturing	मुख्य प्रजातियां/ Main Species	अन्य मिश्रित प्रजातियां/ Miscellaneous Species
11	प्रयोग की जाने वाली लकड़ी की गुणता (हरी/सूखी/गौजी इत्यादि) Quality of Wood used (Green/Dry/Gauji)		
12	क्या आपको पर्याप्त मात्रा में कच्चा माल से उपलब्ध हो रहा है? Are you getting raw material in adequate quantity.	हाँ / नहीं यदि नहीं तो कारण .... Yes/No, If No, specify reasons	

13	कच्चे माल की वार्षिक खपत (प्रजातित्वार विवरण) Yearly Consumption of the Raw material (Species wise)	प्रजाति Species	खुले बाजार/Open Market		उ० प्र० के वनों से/ U.P. Forests			
			मात्रा/Qty. (कुन्टल)/ (Qt.)	मूल्य/Value (लाख.रू.)/ Lakh Rs.	मात्रा/Qty. (कुन्टल)/ (Qt.)	मूल्य/Value (लाख.रू.)/ Lakh Rs.		
		2016-17						
		खैर बुड़/Khair						
		खैर जूस/Khair Juice (Liquor)						
		काजू छिलका/ Cashew Husk						
		अन्य						
		2017-18						
		खैर बुड़/Khair						
		खैर जूस/Khair Juice (Liquor)						
		काजू छिलका/ Cashew Husk						
		अन्य						
		2018-19						
		खैर बुड़/Khair						
		खैर जूस/Khair Juice (Liquor)						
		काजू छिलका/ Cashew Husk						
अन्य								
14	क्या आप विदेशों से कच्चे माल का आयात करते हैं? Do you import raw material from abroad?					हां/ नहीं Yes/No		
15	यदि उक्त क्रमांक-14 का उत्तर "हां" है, तो विदेशों से माल प्राप्त करने की प्रक्रिया /If answer to Sl. no. 14 is "Yes", then specify the procedure.	सीधे आयात/ डीस्ट्रीब्यूटर के माध्यम से/						
16	विदेशों से आयातित माल की वार्षिक खपत Yearly consumption of imported raw material	आयातित सामग्री का नाम Name of imported material	आयातित सामग्री/ Imported Material		क्रय किये गये माल का स्रोत Source of Material	देश का नाम Name of Country		
			मात्रा/Qty. (कुन्टल)/ Qt.)	मूल्य/Value (लाख रू./ Lakh Rs.)				
		2016-17						
		2017-18						
		2018-19						
17	क्या आप सरकारी स्रोत/वन निगम से कच्चा माल क्रय करते हैं? Do you procure raw material from Govt. Source/U.P. Forests Corporation?					हां / नहीं Yes/No		

18	राजकीय स्रोत अर्थात् उत्तर प्रदेश वनों से कच्चा माल क्रय करने में कठिनाई (यदि कोई है?) / Difficulties faced in procuring Raw Material from Govt. Source, i.e. U.P. Forests(If any?)	1-			
		2-			
		3-			
19	कच्चे माल की आपूर्ति की निरन्तरता बनाए रखने हेतु इकाई/फैक्ट्री द्वारा किये गए प्रयास / Action taken by unit/Factory for sustainable supply of raw material.				
<b>(ग)–उत्पादन विवरण / (C)-Production Details</b>					
20	वार्षिक उत्पादन (इकाई अंकित करें) Yearly Production (Specify Unit)	उत्पाद / Product	2016–17	2017–18	2018–19
		कत्था / Kattha			
		कच्छ / Cutch			
<b>(घ)–विक्रय का विवरण / (D)- Sales Details</b>					
21	विगत 03 वर्षों की बिक्री मात्रा (इकाई अंकित करें) Sale of last 03 years Quantity ( Specify Unit) मूल्य (लाख रु.) Value (Lakh Rs.)	उत्पाद / Product	2016–17	2017–18	2018–19
		कत्था मात्रा			
		कत्था मूल्य			
		कच्छ मात्रा			
		कच्छ मूल्य			
<b>(ङ)–संसाधनों की उपलब्धता / (E)- Infrastructure</b>					
22	प्लांट एवं मशीनरी Plant & Machinery	मशीनों के नाम / Name of Machines	संख्या / Number	उत्पादन क्षमता / Production Capacity	देश में निर्मित / विदेश से आयातित Indian made/ Imported from abroad
23	दैनिक कार्य अवधि (घन्टे) Working Hours		शिफ्टों की संख्या / No. of Shifts		
24	औसतन वार्षिक कार्य दिवस Avg. annual working Days	200 दिनों से कम (Less than 200 days) 200–250 दिन(Days) 250–300 दिन(Days) 300–365 दिन(Days)			

25	अवकाश की अवधि में फैक्ट्री में काम की स्थिति Activities in Factory during Holidays	पूर्णतया बन्द रहता है/आंशिक बन्द रहता है Fully Close/ Partially Close				
26	विद्युत आपूर्ति पर निर्भरता Dependency on Electricity	पूर्ण निर्भर/आंशिक निर्भर/निर्भर नहीं Fully Dependent/Partially Dependent/ Not Dependent at all.				
27	जनरेटर पर पूर्णतया निर्भर Dependent on Generator Set	हां / नहीं / आंशिक                      Yes / No/ Partially				
28	विद्युत खपत Electricity Consumption	वर्ष / year	मासिक / Monthly		वार्षिक / Yearly	
			यूनिट / Unit	व्यय / Exp. (Rs.)	यूनिट / Unit	व्यय / Exp. (Rs.)
		2016-17				
		2017-18				
	2018-19					
29	विद्युत विभाग से सम्बन्धित कठिनाईयां, (यदि कोई है?) Problems with Electricity Dept.(if any?)					
30	मानव संसाधन-कुशल Man Power – Skilled	कुशल श्रमिकों की संख्या / No. of Skilled Man Power:  आसानी से उपलब्धता- हां/नहीं यदि नहीं तो, कारण इंगित करें:  Easily Available - Yes/No If No, specify the reasons:				
31	मानव संसाधन-अकुशल Man Power – Unskilled	अकुशल श्रमिकों की संख्या / No. of Unskilled Man Power:				
32	भारत सरकार की "कौशल विकास योजना" का कत्था उद्योग पर प्रभाव / Impact of "Kaushal Vikas Yojna" of GOI on Kattha Industry.					
<b>(च)-वित्तीय स्थिति / (F)- Financial Status</b>						
33	विगत 03 वर्षों का टर्नओवर (लाख रु.) Turnover of last 03 years (Lakh Rs.)	2016-17		04 वर्षपश्चात् टर्नओवर का लक्ष्य Expected Target of Turnover after 4 yrs.	(लाख रु.)	
		2017-18				
		2018-19				
34	वर्तमान पूंजी निवेश Total Capital Investment as on date			(करोड़ रु.) / (Crore Rs.)		

35	कुल वार्षिक व्यय Yearly Expenditure	2016-17	रु./Rs.	
		2017-18	रु./Rs.	
		2018-19	रु./Rs.	
36	वार्षिक कर देयता / Yearly Tax Component	वर्ष / Year	जी. एस.टी. / वाणिज्यिक कर GST/Com. Tax	आय कर / I.Tax
		2016-17(रु./Rs.)		
		2017-18(रु./Rs.)		
		2018-19(रु./Rs.)		
<b>(छ)-सामान्य सुझाव / (G)- Suggestions</b>				
34	सरकार की संशोधित उद्योग नीति का आपके उद्योग पर प्रभाव व सुधार हेतु आपके सुझाव / Effect of revised government Industrial Policy on your Industry & suggestions for improvement			
35	सूचना उपलब्ध कराने वाले व्यक्ति का विवरण / Details of respondent	नाम / Name:  पद नाम / Designation:  मोबाइल नम्बर / Mobile No.:		

Date:  
Place:

Name & Signature  
Research Investigator



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