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FORESTRY PLANNING AND DEVELOPMENT PROJECT

CONSULTANCY REPORT

WOOD USE IN THE MATCH INDUSTRY
OF PAKISTAN

By

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**for the
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and
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TABLE OF CONTENTS

	Page
EXECUTIVE SUMMARY	1
CHAPTER I INTRODUCTION	2
CHAPTER II OBJECTIVE AND SCOPE	4
CHAPTER III PAST PRODUCTION	5
CHAPTER IV SUMMARY OF RESPONSES TO QUESTIONNAIRE ...	9
CHAPTER V CONCLUSION	17
CHAPTER VI SUGGESTIONS AND RECOMMENDATIONS	19
REFERENCES	21
APPENDICES	22

17

EXECUTIVE SUMMARY

The match manufacturing industry in Pakistan is presently composed of 12 units. All these units are self contained, privately-owned and wood-based. Manufacturing, finishing, and packing operations are carried out with the help of modern machinery. The total annual production of these units is about 2200 million boxes with wood consumption of 163,800 m³ per annum. The production during the year 1989-90, 1990-91 and 1991-92 is expected to increase to 2900, 3100 and 3200 million boxes with wood requirement of 158,000, 183,400 and 191,600 m³ respectively.

The poplar wood grown in the Peshawar valley is the major source of raw-material for the match industry. Presently, the price of wood varies from Rs.40/- to Rs.65/- per 40 kilograms at factory gate and depends upon transportation distance from supply source to the manufacturing units. The wood supplied to the units has generally a moisture content of 50-70%. About 20-30% round wood is wasted during veneering process which includes bark, trimmings and cores. In addition to wood, other material such as paper, cardboard, glue and chemicals are also used to produce matches. The average whole sale price for family size (75 splints) and commercial size (40 splints) match boxes is Rs.0.45 and Rs.0.23 respectively. The match industry employs 2676 persons throughout the country.

The industry is presently getting sufficient wood raw material and is not facing any significant problem in this regards. This situation is expected to continue in near future.

CHAPTER-I
INTRODUCTION

Pakistan has very small forest cover of 5% of the total land area. Its rapid population growth coupled with rising living standard has resulted in increased consumption of wood and wood products. The production of wood from the designated forest area and farmlands is generally considered to be insufficient to meet increasing present demand of wood-based industries in the country. The situation is expected to become critical in future especially when indigenous production of pulp and paper is undertaken. This study is part of grand exercise undertaken under Forestry Planning and Development Project of the Ministry of Food, Agriculture and Co-operatives to determine present consumption and future demand of wood raw material by different wood-based industries in the country. The Winrock International Islamabad office is supervising it under the guidance of the Inspector General of Forests. The Pakistan Forest Institute was asked to undertake a study specifically for match industry.

The match industry in Pakistan has considerably developed since creation of Pakistan. Earlier, the expansion of match industry could not take place on account of non-availability of suitable wood raw material in western part and their availability from the eastern part of the country till 1971. Prior to 1971, the bulk supply of matches to this part of the country was coming from Eastern wing. After dismemberment of the country in 1971, the

3

units in Pakistan. As a result, more than 100 match units were established in the country during seventies. However, only 13 units used wood as raw material. Almost all units were established within a short period of time to earn maximum profit without considering the economic efficiency of the unit, availability of raw material and local demand of match boxes in the country in the long run. The development of competitive market for matches forced inefficient units to cease production. This elimination process has brought the numbers of functional units down to 12 units in 1989-90.

CHAPTER-II

OBJECTIVE AND SCOPE

2.1 Objectives

The objective of the present study was to find out past, present and future demand of wood for match industry in Pakistan.

2.2 Scope

A nationwide sample survey for match industry was proposed by the Winrock International under Forestry Planning and Development Project. The sample survey was proposed to be undertaken from May to July, 1990. A questionnaire for the survey of the industry was provided by Winrock International. This questionnaire was first pretested and was revised in the light of experience gained during pre-testing. The original and revised versions of questionnaires are given in Appendix II and III. A list of all match manufacturing units of the industry was prepared with the help of data collected from the President Match Manufacturing Association. The total units in operation at the time of survey were 12 and their number was so small that it was decided to include all units in the sample for collection of data in accordance with the revised wood consumption survey questionnaire. It was mailed to all units in July, 1990. The response of manufacturing units through mailed questionnaire was very poor. Only one unit responded till September 15, 1990. It was then decided to visit each and every industry and collect data through personal interviews.

CHAPTER-III

PAST PRODUCTION

At the time of its independence, Pakistan did have two match industry. A number of studies were carried out in subsequent years to determine scope of establishment of different wood-based industries. The first such study was carried out by Mr.S.M. Ishaq of the Pakistan Forest Institute in 1957. It was followed by a survey conducted by the Department of Trade Promotion and Commercial Intelligence, Government of Pakistan in 1958. Dr. G.M. Khattak and Mr. M. Amjad also addressed this problem in 1981 as did M/S M.I.Sheikh and Saliheen Khan in 1985. The period from 1947 to the present time has been divided into two distinct periods for the purpose of following review of match production in Pakistan.

3.1 Before 1970-71

At the time of independence in 1947, and for a number of years afterwards, only three match factories were operating in the country; two in Western Wing and one in Eastern Wing (now Bangladesh) of Pakistan. Out of two factories located in West Pakistan, both wood based, one was at Shahdara near Lahore with annual production capacity of 90 million boxes and the other at Khairpur with production capacity of 18 million boxes per annum. The Shahdara match factory ceased production from August, 1951 to February, 1954, due to unknown reasons. At about this time, another factory was established at Landhi near Karachi to manufacture box matches. The main raw material used in this unit was paper and card board imported from Scandinavian countries. The annual production capacity of this unit was 600 million boxes of 20 sticks each. However, the total production of all three factories was 114 million boxes. It was sufficient to meet only 10% of the demand of matches in the country which by 1955-56, was estimated to be 504

million boxes. Therefore, most of the demand was met by import of matches.

As a result of increasing demand for matches the number of manufacturing units increased to 11 with production capacity of about 648 million boxes per annum by 1958. At this time, two types of match boxes were produced in Pakistan, namely, wooden box matches and book matches. Wood constituted the major raw material for production of box matches in 6 out of 11 units. It consisted of kail (*Pinus wallichiana*) and chir (*P. roxburghii*) woods at the Shahdara match factory and bahan (*Populus cuphratica*) and mango (*Mangifera indica*) in the factory located at Khairpur. The annual wood consumption of these two factories was 9200 m³ and 1000 m³ respectively. The annual requirement of book match unit at Landhi was estimated at 2600 tons of card board and paper, which were roughly equivalent to 9700 m³ of wood. However, due to shortage of suitable wood, the actual production was only 114 million boxes against installed capacity of 648 million boxes and demand of 504 million boxes. In other words, the industry was utilizing only 22% of installed capacity. The balance demand of 360 million boxes was met through imports.

During sixties, match manufacturing facilities expanded in East Pakistan (now Bangladesh) and almost whole of local demand of this product was met by matches manufactured in that part of the country. The matches were manufactured from low density wood of hardwood species e.g. semal (*Salmalia malabarica*). However, situation changed suddenly and drastically in 1971 with the creation of Bangladesh and the supply of matches from eastern part to western part was stopped. Pakistan was left with production of only 2 units in western part with production of 170 million boxes per annual.

3.2 After 1970-71

Following stoppage of supplies of matches from eastern part to western part of Pakistan, the production in the latter increased fastly over the years especially after 1975-76, to meet demand of matches in the country. To start with, most of the units were small in scale and used waxed thread for splints and cardboard for boxes. The unit located in NWFP was wood-based and used chirpine and kail woods. Both woods were resinous and costly and were not suitable for match manufacture. However, later on, the wood of hybrid poplar trees introduced in the country especially that grown in Mardan, Peshawar and Charsadda districts of NWFP, in mid sixties was found to be suitable raw material for this purpose in the plants located throughout the country. This facilitated expansion of the industry. Side by side, manufacture of book matches from cardboard also increased greatly.

The production data for both wooden box and cardboard book matches during a period of 18 years from 1970-71 onwards is presented in Table 1. Initially, the number of manufacturing units increased at a fast rate to meet the product demand and attained peak in 1978-79. Though their number started decreasing after 1979-80 as some of the inefficient and uneconomic units stopped production, still the total production continuously increased over the years in operating as well as new units established for this purpose. On the whole, the production increased 15 times during 18 years period from 1970-71 to 1987-88. Further, the production of book matches from cardboard stopped completely by 1985-86.

Table 1. Production of matches in Pakistan

Year	No. of reporting units	Production million boxes
1970-71	2	170
1971-72	13	241
1972-73	63	348
1973-74	50	372
1974-75	55	466
1975-76	66	593
1976-77	78	781
1977-78	93	1139
1978-79	101	1275
1979-80	101	1444
1980-81	94	1672
1981-82	87	1337
1982-83	73	1403
1983-84	79	1690
1984-85	69	1765
1985-86	50	1899
1986-87	38	2130
1987-88	18	2491
1988-89	12	2161

Source: The State of Forestry in Pakistan, 1990.

4.5 Annual Production

to
4.7

The average annual number of operating days of entire industry was estimated to be 296 days, out of which 291 were effective operating days. Almost all firms provided data about match boxes produced by them during last three years. The annual production of the match industry was 2160.9 million boxes during 1988-89. M/S Orient Match Company, Shahdara, Lahore, was found to be a biggest producer of matches with average annual production of 179 million match boxes per shift. The data are given in Table 3.

Table 3. Annual production of match industry

Year	Total installed capacity (3 shifts)	Annual production	Capacity utilization percent
1986-87	4160.0	1853.2	44.5
1987-88	4160.0	2060.6	49.5
1988-89	4160.0	2160.9	59.9

4.8 Wood Consumption and Requirements

The match industry is at present using wooden splints and cardboard boxes. Cardboard and paper are locally made. Not a single unit has subsidiary or down stream unit of cardboard and paper. The information about actual quantities of wood consumed by different units during last three years was obtained. All units reported that their requirements of wood raw material are being met fully and satisfactorily. However, it was difficult for them to classify the wood according to its source of supply. Almost all were of the view that the major source of their wood supply is the poplar wood grown on the farmlands in Peshawar Valley. The average annual wood consumption of match industry in Pakistan is estimated to be about 143,223 m³. The unit-wise wood consumption is given in Table 4. The consumption of wood is increasing at a variable rate with increase in demand of matches.

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Table 4. Actual wood consumption for match units

S.No.	Name of unit	Wood consumption (m ³)		
		1986-87	1987-88	1988-89
1.	Orient Match Factory	16,166	16,000	16,667
2.	Popular Match Factory	10,667	10,667	11,333
3.	Ujala Match Industry	2,000	2,000	2,000
4.	Mohsin Match Factory	600	800	1,000
5.	Syed Match Factory	70,000	75,000	94,333
6.	Fazal Sons Match Industry	600	808	1,017
7.	Burney's Match Industry	7,500	9,168	10,350
8.	Jugno Match Industry	5,333	5,333	5,500
9.	New Fazal Match Industry	1,017	1,035	1,037
10.	Noor Match Factory	6,212	8,004	7,189
11.	Sind Match Industry	11,885	11,778	12,512
12.	Chinar Match Factory	500	583	667
Total		132,480	133,420	163,770

4.9 Factory Gate Wood Prices

to
4.12

The transportation distance of raw material to the match factories varies from 10 to 1700 km. The moisture content of wood upon arrival in factory varies from 50 to 70%. Generally, the desirable billet size for match manufacture is 50 cm diameter and 75-150 cm length. The record of factory gate prices of this type of wood was made available by the owners which indicated the quantity of wood supplied and the price paid to the contractors for the supply of wood. The industry is using wood of only one tree species of hybrid poplar. The source of woody raw material is not recorded by them. Similarly, the price of the wood procured from state forest and farmlands is also not separately exhibited in the records. The gate price of wood paid by individual operating units during 1990 is given in Table 5. The variation in prices is mainly due to distance involved in transportation of wood from Peshawar valley to the manufacturing units.

Table 5. Factory gate prices of wood for match industry

S.No	Name of units	Gate price Rs./40 kg
1.	Orient Match Factory	53.00
2.	Popular Match Factory	63.00
3.	Ujala Match Industry	53.00
4.	Mohsin Match Factory	45.00
5.	Syed Match Factory	48.00
6.	Fazal Sons Match Industry	55.00
7.	Burney's Match Industry	65.00
8.	Jugno Match Industry	63.00
9.	New Fazal Match Industry	40.00
10.	Noor Match Factory	45.00
11.	Sind Match Industry	65.00
12.	Chinar Match Factory	55.00

4.13 Waste Material Utilization

Hybrid poplar is the most preferred wood for match splints as compared to other species grown in Pakistan. The minimum utilizable girth of log is 50 cm. After debarking the logs are cut into 37.5 cm long billets and fixed on the peeling machine. The machine peels the billets into 2 mm thick veneer sheets. The veneer sheets thus produced are cut into 1830 mm long and 344 mm wide sizes and piled in the form of lots each of sheets 70-80 in number to load them in a drying chamber. The dried sheets are then fed to the chopper which converts them into match splints of 43 mm length, 2 mm width and 2 mm thickness. The splints are transferred to the slotted shaking screens which also grades them. The splints of the desired sizes are then immersed in a chemical solutions. After immersion the splints are passed through drying chambers for final packing.

There are different stages of wood wastage generation in the match manufacturing units. In the first stage waste is generated at the time of removal of bark on the billets. The second stage is the discarded material in the form of veneer chips during peeling. The third and important waste is in the form of 3-5 cm

thick solid core to which a machine can peel down a billet. There is also some wastage when veneer sheets are converted into splints. Finally, some wastage occurs when the splints are dipped into chemicals and packed in boxes. The total wastage is in the order of 20-30% of round wood supplied to the factories.

Upon enquiry, the manufacturers informed that all wood waste, obtained in different forms and stages is utilized by them in the furnaces. It was also observed that some of the wood waste is sold as fuel to individual buyers and as a raw material to chipboard industry. The price at which different types of wood wastes are sold by them is not known.

4.14 Other Materials

Cardboard and wrapping paper are other major raw materials used for match manufacturing. Not a single firm could supply the requisite data in quantitative terms. However, each and every unit is consuming considerable quantities of cardboard and paper products for packing and wrapping purposes.

4.15 Expected Production and Wood Consumption

All firms willingly answered questions regarding expected annual production and wood consumption in coming three years. On the basis of information supplied by them, the average annual production of match industry is estimated at 3041.7 million boxes with average wood consumption of 177,690 m³ per annum. Table 6 gives projected match production and wood consumption of all units in the country.

Table 6. Projected production and wood consumption of match units

Sl. Name of unit	Production million boxes			Wood consumption (m ³)		
	1988-90	1990-91	1991-92	1989-90	1990-91	1991-92
1. Orient Match Factory	5,200.0	5,300.0	5,300.0	17,333	18,500	18,500
2. Popular Match Factory	1,640.0	1,664.0	1,700.0	2,833	15,667	16,667
3. Ujala Match Industry	10,000.0	10,000.0	10,000.0	4,167	4,167	4,167
4. Mohsin Match Factory	420.0	480.0	600.0	900	1,000	1,083
5. Syed Match Factory	1,700.0	1,800.0	1,900.0	96,166	99,333	103,833
6. Fazal Sons Match Industry	485.0	610.0	544.0	907	1,025	1,100
7. Burney's Match Industry	3,650.0	4,000.0	6,300.0	10,500	10,833	11,667
8. Jugno Match Industry	820.0	832.0	850.0	1,417	7,833	8,333
9. New Fazal Match Industry	361.2	493.0	441.4	1,120	1,158	1,160
10. Noor Match Factory	2,901.5	3,191.7	3,510.8	1,000	1,050	11,917
11. Sind Match Industry	2,132.0	2,205.0	2,230.0	10,202	10,550	10,670
12. Chinar Match Factory	620.0	620.0	620.0	2,500	2,500	2,500
Total	2,885.9	3,068.5	3,170.8	158,050	183,400	191,620

4.16 Current Product Price

Two type of match boxes are being sold in the market. One is family size containing 75 splints and the other is commercial size with 40 splints with average manufacturer's wholesale selling price of Rs.0.45 and 0.23 respectively.

4.17 Unit Cost of Production

Only four units provided information on unit cost of production. The cost of wood is about 10 percent whereas the share of labour cost is 40 percent of the total cost of the product. It

was estimated that about 30 percent of the cost is incurred for the purchase of chemicals utilized in match manufacturing. The remaining 20 percent of the cost consists of fixed costs, capital costs, risk and profit.

4.18 **Employment**

The total number of workers employed in the industry were found to be 2676. Of these, 220 were managerial, professional and office, 1076 were skilled workers and 1380 were semi-skilled and casual labours. The maximum number was employed by M/S Mohsin Match Manufacturing unit and minimum by M/S Jugno Match Factory.

4.19 **Problems of Wood Supply**

The match manufacturers purchase poplar wood from growers through their own agents and contractors. The only problem being faced by the manufacturers is shortage of woody raw material during the harvesting of agricultural crops when labour is not available in poplar growing area for felling and conversion of trees. As a result of this shortage small size logs upto 35 cm diameter are some times supplied to the factories by the contractors. The industry also faces some competition in procurement of poplar wood because it is also used for packing cases, sports goods, housing and furniture.

4.20 **Problems in Marketing of Products**

At present, the match manufactures are not facing any problems in marketing of their products.

4.21 Reasons for Low Capacity Utilization in Production

The present number of match manufacturing units is 12. The total installed capacity of these units was 4160 million boxes on three shift basis. Orient match factory alone has a total production capacity of 376 million boxes against which only 167 million boxes are produced per shift and is running at 44.4 percent of its total capacity. The fate of other units is not much different than the factory mentioned above and not a single unit is operating at full capacity. The data reveals that the match industry has the capacity to increase production if the future demand increases.

All the surveyed units reported their potential for running at three shift basis but only two units are running on three shift basis. The remaining seven units are operating on two shifts of extended duration of 12 hours each. The remaining three units are working on single shift of eight hours.

Upon enquiry the match manufacturers revealed that seasonal shortage of wood, chemical, manpower and powerload shedding are the major causes of low capacity utilization.

4.22 Suggestions for the Improvement of Match Industry

Following suggestions were offered by the manufacturers during the discussions:

- Introduction of scientific marketing system in the poplar growing areas.
- Direct sale of poplar wood by forest departments to the match industry in the case of irrigated plantations of Punjab.
- Introduction of other poplar species such as Aspen (Populus tremuloides) in the country.

CHAPTER-V

CONCLUSION

5.1 Capacity Utilization and Expansion

The present total installed capacity of the match industry is 4160 million boxes on three shift basis. However, the average annual production is about 2025 million boxes which is less than half of installed capacity. On an average the capacity utilization is about 48.7 percent.

The number of match factory units during 1956 in Pakistan were 11. Out of these six were wood-based and five were using paper and cardboard for manufacture of matches. At the time of survey only one new unit was added to the match industry and thus their total number is twelve. However, considerable change was brought in the use of raw material in the intervening years. These include manufacturing of boxes from cardboard instead of wood and of splints from wood instead of waxed thread, paper or hardboard.

5.2 Wood Consumption

The actual wood consumption during the year 1988-89 was 163.8 thousand m³ whereas the proposed demand for the year 1989-90, 1990-91 and 1991-92 is 158.1, 183.4 and 191.6 thousand m³. Presently, there is no shortage of wood for the industry and none is expected in near future.

5.3 Availability of Substitute

The locally available poplar wood is considered to be the most suitable raw material for match industry. No other local or imported wood is used for this purpose. However, semal and mango

woods could be considered to be close substitute of poplar wood but not a single unit has indicated any demand for these during survey. The only non-woody substitute to poplar wood is wax-paper but the change in the preference of consumer has slowly led to disappearance of book match from market which used to be made of paper and cardboard. Since early eighties not a single unit is producing any match box of this kind for the domestic market.

5.4 Match Consumption

The per capita consumption during 1956 was about one box per person/annum. Present per capita match consumption is about 24 boxes. In other words, one kg of wood is required annually to meet the present per capita demand for matches. The projected per capita match consumption would be 27 boxes in the year 1991-92. This increase in per capita consumption can be attributed to rise in living standard, conservative use of industrial household fuels (gas and kerosene) requiring frequent match lighting for burning and an increase in number of commercial fuel consumers as well as smokers.

5.5 Marketing

At present the match manufacturers do not face any problem in marketing their products. However, they do face problems such as power load shedding, non-availability of chemicals, manpower and seasonal shortage of woody raw material at the time of harvesting agricultural crops.

CHAPTER-VI

SUGGESTIONS AND RECOMMENDATIONS

The match manufacturers have put forward following suggestions and recommendations during visits to their factories at the time of data collection.

6.1 Farmlands are contributing a major portion of raw material to the match industry, but existing marketing system is neither efficient nor satisfactory. Development of an integrated marketing system would benefit both the producers and users of poplar.

6.2 The sale of poplar wood from forest plantations are monopolized by the professional forest contractors. This practice results into cartel formation and charge of exorbitant profits at the time of sale of wood to the users. This system could be done a way and wood sales should be directly made to match units through long-term sale contracts.

6.3 In irrigated plantations, the felling and transportation of trees and sale of wood are lengthy and time consuming processes. During this period, the logs become dry and unfit for peeling and splints making. It was suggested that the sale of poplar wood should be made directly to the match industries on escalating reserve prices basis in a shortest possible time of felling and conversion of trees. This process will result in efficient utilization of the resource and early recovery of the profit by both producers and consumers.

6.4 The possibility of introduction of Aspen (Populus tremuloides) in the country should be explored as this wood is considered to be most suitable for match manufacture. This wood is extensively used for matches in European countries.

6.5 The match production in Pakistan has steadily improved over the years. The whole industry is wood-based. The present production is apparently sufficient to meet current demand of the product, though it is much below installed capacity. Further, its prices have remained stable for a number of years in the local market. The industry is not facing any significant problem in procurement of wood raw material and nor does it expects to do so in near future. Under the circumstances, it would be desirable to explore export potential of matches especially to the Middle East Countries. This would encourage utilization of installed capacity to the maximum, help generate additional jobs and increase demand and production of poplar wood in the country.

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LIST OF MATCH FACTORIES

1. M/S Syed Match Company Ltd.,
Rohana Road Sarai Saleh,
Haripur.
2. M/S Burney's Industrial and Commercial Co.(Pvt),
O.T. 5/6, Rampart Row,
Bombay Bazar,
P.O.Box No.6110,
Karachi.
2. M/S Mohsin Match Factory (Pvt) Ltd.,
90-B, Industrial Estate,
Jamrud Road,
P.O. Bcx No.427,
Peshawar.
4. M/S Channar Match Factory,
P.O. Box No.49,
Mirpure (Azad Kashmir).
5. M/S Fazal Sons Match Industries (Pvt) Ltd.,
15 K.M. Lahore-Sheikhupura Road,
Distt. Sheikhupura.
6. M/S Sind Match Works (Pvt) Ltd.,
H-1, State Life Building No.4,
Shahra-e-Liaquat,
P.O.Box No.5866,
Karachi.
7. M/S Popular Match Industries,
Jinnah Road,
Opp. Post Office,
Tando Adam,
Hyderabad.
8. M/S Noor Match Factory Ltd.,
Azmat Building,
Chowk Yadgar,
Peshawar.
9. M/S Jugno Match Industries,
Tando Adam,
Hyderabad.

10. M/S Orient Match Co. (Pvt) Ltd.,
Grant Trunk Road, Shahdara,
GPO Box No.404,
Lahore.
11. M/S New Fazal Match (Pvt) Ltd.,
Par Hote,
Mardan.
12. M/S Ujala Match Factory (Pvt) Ltd.,
P.O.Box No.31,
Jhang Road,
Chiniot.

**WOOD CONSUMPTION SURVEY QUESTIONNAIRE
MATCH INDUSTRY**

1. Name and address of the firm Serial No. _____
Date _____

2. Year the Firm was established _____

3. Current Annual Installed Capacity per shift by Product:

No. of possible Shifts	Potential Production Per Shift
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

4. Potential Number of Shifts/Day _____

5. Annual Production by Types of Product:

	No. Produced per Year		
	1986/87	1987/88	1988/89
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

6. Actual wood requirement during last three years:

Year	Species used		Wood consumption cft/m ³	Type of Product
	<u>Local</u> Farm lands	<u>Imported</u> State lands		
1986-87				
1987-88				
1988-89				

7. Existing market prices of wood raw material species-wise at the factory gate:

S.No.	Species	Local Rs./cft/m ³		Imported Rs./cft/m ³	
		Farm lands	State lands	Farm lands	State lands

- 1.
- 2.
- 3.

8. Raw Material Utilization

Types of Wood Waste _____
 Uses of Wood Waste _____

9. Materials used other than wood

Cardboard _____
 Paper _____

10. Expected Annual Production by Types of Product (Nos.) and expected

	1989/90	1990/91	1991/92
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

11. Current selling price of the product:

Price Rs./unit

12. Unit Cost of Production

Wood _____ %
 Labour _____ %

13. Number of Employees

Professional/Managerial _____
 Office Staff _____
 Skilled _____
 Semi/Unskilled _____
 Casual _____

**REVISED WOOD CONSUMPTION QUESTIONNAIRE
MATCH INDUSTRY**

Serial No. _____

Date _____

1. Name and address of the Firm

2. Year the firm established _____

3. Current annual installed capacity per shifts: _____

No. of possible shifts

Production capacity
per shift

4. Potential No. of shift/day

5. No. of operating days

6. No. of effective operating days

7. Annual actual production by types of products

No. produced per year

1986-87

1987-88

1988-89

8. Quantity of actual wood requirement:

Products

Wood species

Wood requirement
cft/m³

9. Transportation of woody raw material distance to factory

10. Moisture content (%)

<u>Species</u>	<u>Moisture</u>
a.	
b.	
c.	
d.	

11. Desirable size of wood:

<u>Species</u>	<u>Size</u>
a.	
b.	
c.	
d.	

12. Possibilities for substitution of wood

<u>Woody</u>	<u>non-woody</u>
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13. Existing market prices of wood species-wise at factory gate:

<u>Source of supply</u>	<u>Wood species</u>	<u>Local/Import price</u> <u>Rs./Cft/m³/40 kg</u>
I. Farmlands	a.	
	b.	
	c.	
	d.	
II. State forests	a.	
	b.	
	c.	
	d.	
III. Imports	a.	
	b.	
	c.	
	d.	

14. Waste material utilization

Types of wood waste	_____
Uses of wood waste	_____

15. Materials used other than wood

Cardboard _____

Paper _____

16. Expected annual production by type of products.

Products	1989-90	1990-91	1991-92
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Expected quantity of wood required

Year	Quantity of wood Cft/m ³ /kg
1989-90	
1990-91	
1991-92	

17. Current selling price of the products Rs./unit.

18. Unit cost of production

Wood	_____	%
Chemical	_____	%
Labour	_____	%
Packing	_____	%

19. Number of employees

Professional/managerial

Office staff

Skilled

Semi-skilled

Casual

Total

20. Problems in obtaining wood

21. Problems in marketing of the products

22. Reasons for low capacity utilization

23. Any suggestions for the improvement of match industry