

FORESTRY PLANNING AND DEVELOPMENT PROJECT

CONSULTANCY REPORT

**CONSUMPTION OF WOOD IN THE
CHIPBOARD/PARTICLE BOARD AND HARDBOARD
INDUSTRIES OF PAKISTAN**

By

National Management Consultants

**Under Contract to:
Winrock International
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**for the
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and
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PREFACE

Pakistan, like most developing countries, has a very low forest cover, constituting barely 5 percent of the total land area. The Country's population is increasing at the rate of about 3.1 percent per annum and rapid urbanization is also taking place, resulting in rise in per capita consumption of forest produce. This has led to increased pressure on Country's already meagre forest resources.

In this situation, chipboard and hardboard provide a good substitute for wood and play a vital role in conserving the Country's forest resources.

This Study was undertaken to determine the present status and future consumption of wood raw materials used in the manufacture of these products.

A field survey was carried out to determine the extent of wood-usage in these industries, the types of woods used and the problems faced by these industries. The future demand of various species has also been determined.

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EXECUTIVE SUMMARY

1.0 INTRODUCTION

Pakistan like most developing countries has a very low forest cover, constituting barely 5 percent of the total land area. Chipboard and Hardboard, a substitute for wood, can play a vital role in conserving the Country's meager forest resources.

At present, there are sixteen units in the Country engaged in the production of Chipboard with a combined production capacity of 131,500 tonnes/annum, while there are five units in the Hardboard industry with a total production capacity of 84,000 tonnes/annum. One of these unit namely 'Crescent Boards Limited' is common to both the industries, as it is manufacturing both chipboard as well as hardboard.

There have been no imports of chipboard in the Country for the past four years while the demand for hardboard is met through both local as well as imported products. However, the import of hardboard also shows declining trend.

2.0 OBJECTIVES OF THE STUDY

The primary objective of the Study was to identify factors causing market failures, bottle necks and market constraints by carrying out a survey and evaluating available secondary data. On the basis of this, to prepare a report on the present and future usage and problems of wood usage in chipboard and other boards manufacturing sectors in the Country.

3.0 RESEARCH METHODOLOGY

The research methodology used for this Study involved analysis of both secondary as well as primary data. As the secondary data was limited and incomplete, the major emphasis of the Study has been on primary data.

A preliminary questionnaire for the survey was provided by Winrock International. This questionnaire was exposed to pretest, on the basis of a which final questionnaire was developed.

As the total number of units in chipboard and hardboard industries together was less than thirty, therefore, instead of drawing a sample a census has been conducted.

4.0 ANALYSIS AND FINDINGS

- o The capacity utilization in both Chipboard and Hardboard industries is fairly low being 48.4 percent and 23.3 percent respectively.



- o The wood raw material used in both these industries consists of 'low grade wood' for which the only other competing demand is as fire wood. The main species used are 'Mango' for chipboard manufacture and 'Kikar' for hardboard manufacture. The existing and estimated demand for the various species of wood used in these industries are given in the tables below:

TABLE 1-1

**EXISTING DEMAND FOR VARIOUS
SPECIES OF WOOD USED IN CHIPBOARD
& HARDBOARD MANUFACTURE (IN TONEES)**

SR. NO.	WOOD SPECIE	DEMAND		
		1987	1988	1989
FOR CHIPBOARD				
1.	MANGO	51,669	53,898	49,719
2.	POPLAR	26,493	26,791	25,321
3.	JANGHI TOOT	-	-	2,164
4.	MIXED WOODS WASTE	8,108	7,899	7,910
SUB-TOTAL		86,270	88,588	88,105
FOR HARDBOARD				
1.	KIKAR (ACACIA NILOTICA)	29,776	34,279	33,895
2.	EUCALYPTUS	14,128	21,493	1,166
SUB-TOTAL		29,776	34,279	35,061
T O T A L		116,046	122,867	123,166



TABLE 1-2

ESTIMATED EXISTING AND FUTURE DEMAND FOR VARIOUS
SPECIES OF WOOD USED IN CHIPBOARD
AND HARDBOARD MANUFACTURE

SR. NO.	WOOD SPECIE	DEMAND			ANNUAL GROWTH RATE FOR THE PERIOD 1990-92
		1990	1991	1992	
<u>FOR CHIPBOARD</u>					
1.	MANGO	49,100	57,944	65,469	15.5 %
2.	POPLAR	28,918	30,597	31,779	4.8 %
3.	JANGHI TOOT	2,761	3,358	4,353	25.6 %
4.	MIXED WOODS WASTE	8,657	8,955	9,702	5.9 %
	SUB-TOTAL	89,436	100,854	111,303	11.6 %
<u>FOR HARDBOARD</u>					
1.	KIKAR (ACACIA NILOTICA)	36,123	40,784	41,716	7.4 %
2.	EUCALYPTUS	14,128	21,493	21,493	23.4 %
	SUB-TOTAL	50,251	63,209	63,209	11.1 %
	T O T A L	139,887	164,063	174,512	11.4 %

- o As can be seen for the above table, the demand for wood in Chipboard industry is likely to increase by 11.6 percent, while the demand for wood in Hardboard industry is likely to increase by 11.1 percent. The total demand for all species of wood used in these industries is likely to increase by about 11.4 percent.
- o The major source of wood raw material for both these industries are the private plantations /orchards and the marginal farmlands.



- o The price of the Mango wood at the factory gate ranges from Rs. 25-30 per maund. The price for Kikar wood ranges from Rs. 18-23 per maund, while the price for Eucalyptus wood is presently Rs. 25-26 per maund.
- o The wood is distributed to the factories by the middlemen, who usually retain a margin of 10-20 percent.
- o Although there is no acute wood raw material problem in these industries at present, however, the industrialists are apprehensive that there is likely to be a shortage of wood in the future, due to increased demand for the finished products and increased competition from fire-wood usage.

5.0 RECOMMENDATIONS

- 5.1 Presently very few species of wood are being used in these industries. Major ones being Mango, Kikar and Poplar. The Pakistan Forest Institute should supply information to these industries about other species having commercial application.
- 5.2 More fast growing wood species should be grown to ensure regular wood supply to these industries.
- ~~5.3~~ Import of lower quality timber should be liberalized.
- ~~5.4~~ 'Houris' should be grown not only in Sind, but also in other parts of the Country like southern areas of Punjab, NWFP and Baluchistan.
- ~~5.5~~ Use of Eucalyptus in these industries should be encouraged.
- 5.6 Capacity utilization in these industries should be increased by stimulating both the local demand as well as by tapping the export potential.

6.0 AREAS FOR FURTHER INVESTIGATIONS

The study has highlighted certain areas where there are information gaps and a need exists to carry out further investigations. There are detailed below:

- 6.1 The role of middlemen in the supply of wood to these industries need to be further investigated, as the industries at present are totally dependent on them for their wood supply.
- 6.2 There is cross movement of wood within the Country which entails high supply costs for wood using industries. There is a need to investigate means of reducing such costs.



- 6.3 There is likely to be a problem of wood supply for these industries in the future. There is a need to identify the incentives to increase tree plantations by both private growers as well as Forestry Departments.
- 6.4 There is a need to develop a policy package to motivate social forestry as well as to develop comprehensive and effective out-reach programs to inform and enlist the support of the general public.. These would be beneficial from both the commercial as well as environmental points of view.



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CHAPTER 1

INTRODUCTION

1.1 CHIPBOARD/PARTICLEBOARD

The Pakistan Standard Institution (PSI) defines chipboard as: "Board made from waste paper with or without partially cooked straw, bagasse, or grass or mixture of these. The chipboard may be of bending or non bending quality. The bending quality is usually linked with kraft etc.", while the same institution defines Particle board as "a sheet material manufactured from small pieces of wood, or other plant and lignocellulosic materials, cut into chips, flakes, splinters, strands or shives and agglomerated by use of an organic binder together with one or more of the agents like heat, pressure, humidity, catalyst, etc. This excludes wood-wool and particle boards made with inorganic binders." Although particle board and chipboard are defined as two separate items, however, in this industry both the terms are considered synonymous.

1.2 TYPES OF CHIPBOARD

Chipboard is produced in various densities depending upon the end use. The general nomenclature being low density, medium density and high density chipboard.

1.2.1 LOW DENSITY CHIPBOARD

Low density chipboard is known for its lightness and has a density upto 400 kgs per M³. It is used as panel material in the interior of houses and other institutions, for heat and insulation, or as core-stock for doors and light furniture where high strength properties are not required. It is mainly produced as one layer board.

1.2.2 MEDIUM DENSITY CHIPBOARD

The Chipboard units in Pakistan are mostly engaged in the production of medium density chipboard ranging in density between 500 - 700 kgms M³. This density is generally 10 to 20 percent higher than wood. This is a three layer board with face and back composed of fine particles to achieve decorative effect, smooth surface and higher strength, while the core material is comparatively coarser. The board can be machined, veneered and painted in the same fashion as wood. It has advantage over wood, as it has the same strength properties in all dimensional directions and does not warp or twist. This chipboard is usually used for tables and desks, tops, fronts, sides and shelves of chests and cupboards, book cases, radio, television and sewing machine cabinets.



1.2.3 HIGH DENSITY CHIPBOARD

This board is generally of 750 kgs and above per M³ and is used as special core stock or for panelling where high density material is required. It can be used for partitions in offices and as a facing material over concretes. It is also used in place where high screw withdrawal resistance is required. Its use is increasingly finding favour in pre-fabricated houses.

1.2.4 TYPES OF CHIPBOARD IN THE MARKET

The main types of chipboard presently available in the market are:

- o Plain Chipboard,
- o Treated Chipboard, and
- o Laminated Chipboard.

Chipboard being a versatile material has many applications which are continuously being extended. It has properties similar to those of wood but being uniform in texture, it offers more consistent working qualities. One of its chief qualities is strength and resilience combined with lightness. This is due to the density grading of the chips which ensure that the material has no directional grain and has, therefore, equal movement and strength in all directions. From this it follows that a wide range of densities give a wide range of strength. Hence it is possible to specify boards for a variety of purposes and applications.

1.3 TYPES OF RAW MATERIALS USED IN CHIPBOARD MANUFACTURE

From the technical point of view, chipboard can be produced from any cellulosic material which provides suitable chips. In practice, agricultural residues like baggasse, cotton stalks, forest residues and wood waste are widely used. The chemical requirements include synthetic glue and other additives such as hardener, wax-emulsion, etc.. The raw materials used are described below :

1.3.1 BAGGASSE

Baggasse is the fibrous portion of the crushed sugar cane left over after the extraction of juices. Baggasse is a potential raw material used in the production of quality chipboard/particleboard.

1.3.2 COTTON STALKS

Cotton stalks, being cheaper compared to wood can serve as useful and economic raw material for the manufacture of chipboard. Only Punjab produces about 2.8 to 3.0 million cotton bales per annum. Large quantity of cotton stalk is



available in Multan, Rahim Yar Khan, Vehari, Sahiwal and Okara districts and can profitably be exploited for chipboard making. It is estimated that over two million tons of cotton stalks are produced in the Country. At present only one factory i.e. M/s. Hercules Board Limited, Hyderabad is using cotton stalks as a raw material. The reason for non-utilisation of cotton stalks as input for production of chipboard is the heavy transportation costs involved, since most of the manufacturing units are located far away from places where cotton stalks are available.

1.3.3 FOREST RESIDUES AND WOOD WASTE

One of the advantages of chipboard production from wood is the elimination of short comings in the raw material, through disintegration of wood to small sized particles so that the end products are uniform in composition and texture. It is natural, therefore, that the chipboard industry tends to utilise lower grades of woods where maximum premium in the price of raw material is available. For this reason, tree residues, consisting of tops, branches, roots, thinning, etc. or wood containing knots and otherwise unsuitable for furniture manufacture constitutes the raw material for chipboard industry. Edgings, cut offs, rejects and shavings from saw mills or other wood processing mills are also used. Barked wood is generally regarded as superior to non-barked wood, mainly because of the appearance of the finished board. The woods generally used in chipboard industry is of such species as Mango, Poplar, Kikar, and coniferous wood.

1.3.4 GLUE

Glue used in this industry is of the urea formaldehyde type. Imported as well as locally manufactured glues are available for this purpose. The imported glue are of solid type, while the locally produced glue is in liquid form containing 65% solid contents. Liquid glue especially in the hot summer creates storage problems at higher temperatures. Therefore, the imported, solid type adhesives are preferred although their price is almost double the price of local liquid glue.

1.4 PRESENT STATUS OF CHIPBOARD INDUSTRY

The Chipboard industry in Pakistan came into existence in the year 1965. The basic aim in establishing this industry was to relieve the acute shortage of timber and wood in the Country and to produce a substitute for solid wood. It was felt that any industrial product which could serve as a suitable replacement for timber or wood would have a large and profitable market. At the same time it would be consonant to the Government policy of conservation of national forest wealth.



At present there are sixteen units engaged in the production of chipboard with a combined production capacity of 131,500 tonnes/annum. Out of these, only one unit namely; Dir Forest Industries Complex is in the public sector, while the remaining 15 units are in the private sector. The table below illustrates the names of the units and their annual installed production capacity.

TABLE 1-1

INSTALLED CAPACITY OF PARTICLE/CHIPBOARD UNITS

(IN TONNES)

SR. NO.	NAME OF UNIT	ANNUAL INSTALLED CAPACITY
1.	Anchor Boards Limited	7,500
2.	Bombay Plywood Industries	4,500
3.	Baluchistan Particle Boards	19,000
4.	Crescent Boards*	20,000
5.	Dir Forest Industries Limited	15,000
6.	Gharib Sons Private Limited	8,000
7.	Hercules Boards limited	4,500
8.	Islamabad Board Mills Limited	4,500
9.	K. D. C. Boards and Plywood (Pvt) Limited	4,500
10.	National Particle Board (Pvt) Limited	9,000
11.	Pakistan Superwood Industries	11,000
12.	Pakistan Chipboard Limited	4,000
13.	Pakitex Boards (Pvt) Limited	5,000
14.	Partico (Pvt) Limited	2,500
15.	Sadiq Wood Industries	4,500
16.	Sind Particle Board Mills	8,000
TOTAL INSTALLED CAPACITY		131,500

* Also manufactures hardboard.



1.5 DEMAND/SUPPLY POSITION OF CHIPBOARD IN PAKISTAN

There have been no imports of chipboard in the Country for the past four years. The entire demand for chipboard in the Country is being met through local production. The total production of chipboard for the past five years is as follows:

TABLE 1-2

PRODUCTION OF CHIPBOARD

(IN TONNES)

YEAR	QUANTITY
1984-85	36,434
1985-86	30,185
1986-87	34,303
1987-88	36,239
1988-89	33,336

Source: Federal Bureau of Statistics.

1.6 HARDBOARD

Pakistan Standard Institution defines Hardboard as "a sheet material manufactured from fibres of wood or other lignocellulologic materials with the primary bond deriving from the arrangement of fibres and their inherent adhesive properties. Its density usually ranges from 50 to 80 lbs. per cubic foot. Other materials may be added during manufacture to improve certain properties, such as stiffness, hardness, finishing properties, resistance to abrasion and moisture, as well as to increase strength, durability and utility."

Hardboard or Fibreboard is the replacement of plywood. As plywood is becoming more costly (its price is four times higher than hardboard) day by day, the use of hardboard as a substitute is expected to increase.

At present, the major uses of hardboard or fibreboard are:

- o In the production of furniture items like back panels, drawer bottoms, cabinets, kitchen furniture, storage chests, etc..
- o As a building material for doors, walls, ceiling, roofing, flooring, etc..



- o In the transportation industry for automobile and bus interiors, railway passenger bogies and freight cars, etc..

1.7 TYPES OF HARDBOARD

The basic commercial types of hardboard are classified as Standard Tempered and Service. These types are described below:

1.7.1 STANDARD

Standard Hardboard is a product in substantially the same form as when it comes from the manufacturing press, except for supplementary processing steps such as humidification to adjust moisture content and trimming to size. This is a hardboard of high strength and water resistance. It generally falls in a specific gravity range of 0.96 to 1.20 (60 to 75 lbs. per cubic foot) (0.66 to 1.20 gm/cm³). Standard Hardboard is generally suitable for applications where good machinability, finishing characteristics, strength and water resistance are needed, such as in furniture, cabinet work, top quality interior panelling, and under certain conditions, for exterior panelling.

1.7.2 TEMPERED

This is Standard Hardboard which has been impregnated with a siccative material such as drying oil blends of oxidizing resins which are stabilized by baking or heating after introduction. Tempered hardboard has opened substantially improved properties of stiffness, strength, hardness and resistance to water and abrasion as compared to standard hardboard. It generally falls in a specific gravity range of 1.0 to 1.20 (62 to 75 lbs. per cubic foot) (0.99 to 1.20 gm/cm³). Tempered hardboard is generally suitable for use where superior strength, water resistance, machinability, finishing characteristics and harder surface are needed. Examples of uses of this type are: wearing surfaces, storage bins, high quality finishing and exterior panelling.

1.7.3 SERVICE

This is a hardboard of strength somewhat less than that of Standard Hardboard. In most cases its specific gravity falls in the range of 0.80 to 0.96 (50 to 60 lbs. per cubic foot) (0.80 to 0.96 gm/cm³). It is in substantially the same form as when it comes from the manufacturing press, except for subsequent processing steps such as humidification and trimming to size. Service hardboard is generally used where its lower weight is advantageous and



where moderate machinability, finishing characteristics, water resistance and strength are suitable. Interior Panelling is an example of the use of this type of hardboard.

1.7.4 TYPES OF HARDBOARD AVAILABLE IN THE MARKET

The main type of hardboard presently available in the market are:

- o Standard Hardboard
- o Laminated Hardboard

In Pakistan, hardboard of thicknesses between 2.5 mm to 3.5 mm are produced. The standard size of the sheet is 8' x 4'. However sheets of 9' x 4' are also produced.

1.8 TYPES OF RAW MATERIAL

At present, the raw material used for the manufacture of hardboard in Pakistan, are wood and bagasse.

1.8.1 WOOD

The wood used in the manufacture of hardboard is mostly 'Kikar'. As the process of manufacture is such that, it involves transformation of wood into small chips, which are then turned into wood pulp, therefore, as in chipboard, the wood used in this industry is also of low grade, consisting mostly of firewood. Besides Kikar, another specie of wood has recently started being used, namely Eucalyptus.

1.8.2 BAGASSE

As in chipboard, bagasse is also used in the manufacture of hardboard. In Pakistan there is one unit namely 'Crescent Board Industries' which is using bagasse for hardboard manufacture.

1.8.3 CHEMICALS & WATER

Besides wood, small quantities of chemicals namely Sulphuric Acid, Paraffin Wax and Phenolic Resin are also needed in hardboard manufacture. Water is also used in huge quantities in hardboard production.

1.9 PRESENT STATUS OF HARDBOARD INDUSTRY

At present, there are five units in the Country engaged in the production of hardboard, with a total installed capacity of 84,000 tonnes per annum. The names of the units alongwith their installed capacity is given in the table below:



TABLE 1-3

INSTALLED CAPACITY OF HARDBOARD UNITS

(IN TONNES)

SR. NO.	NAME OF UNIT	ANNUAL INSTALLED CAPACITY
1.	Asia Board Industries	9,000
2.	Crescent Boards Limited*	18,000
3.	Fibretex Industries Limited	24,000
4.	Oosman Brothers Hardboard Inds.	24,000
5.	Pak Hardboard Industries Ltd.	9,000
TOTAL INSTALLED CAPACITY		84,000

* Also manufactures chipboard.

1.10 DEMAND/SUPPLY POSITION OF HARDBOARD IN PAKISTAN

In 1987, the Hardboard Industry in Pakistan was facing a severe crisis. Not only was the local industry having over capacity i.e., production capacity more than annual demand, but, it was also facing severe competition from the imported hardboard. There was extensive underinvoicing being practised by the importers, reaching upto more than half of the actual price. In 1986-87 budget, the import duty and sales tax on imported hardboard had been reduced from 120 percent to 80 percent and from 20 percent to 12.5 percent respectively. As such, the price of imported hardboard had fallen even below that of the local product.

However, in 1988, corrective action was taken by the Government and correct import trade prices were fixed to counter the menace of under invoicing. This greatly helped in the rehabilitation and re-vitalization of the local hardboard industry.

At present, the demand for hardboard is met by both local as well imported product. The total supply position of hardboard for the past three years is given in the table below:



TABLE 1-4

SUPPLY POSITION OF HARDBOARD 1986-89

(IN TONNES)

YEAR	LOCAL PRODUCTION	IMPORTS	TOTAL SUPPLY
1986-87	13,301	12,001	25,302
1987-88	19,230	2,082	21,312
1988-89	19,614	1,411	21,025

Source: Primary Data and Federal Bureau of Statistics.

The above table clearly indicates that although the local production has increased but the total supply has gone down.

1.11 FORESTRY SUB-SECTOR AND THE SEVENTH-FIVE YEAR PLAN

The Seventh Five Year Plan aims to lay greater emphasis on tree extension programs like raising energy plantations and social and farm forestry on marginal private lands. Under these programs, demonstration plantations are to be raised. On-the-job training in farm forestry techniques is to be provided. The wood production from government owned coniferous forests and irrigated plantation is envisaged to be raised through improved management practices, better technology, improved infrastructural facilities and optimal utilization of standing trees, through improvement of the logging system.

The total allocation for the forestry sub sector in the Seventh Five Year Plan is Rs.315.95 million, out of which Rs.95.12 million is for Punjab, Rs.181.66 million for Sindh and Rs.39.17 million is for N.W.F.P. There is no budget allocation for Balochistan.

The physical targets for the forestry sub-sector in the Seventh Five Year Plan are as follows:



TABLE 1-5
PHYSICAL TARGETS FOR FORESTRY SUB-SECTOR
IN 7TH FIVE YEAR PLAN

PRODUCT	1982-83	1987-88	1992-93	GROWTH RATE*	
	(ACTUAL.)	(TARGET)	(PROJ)	1983-88	1988-93
Wood Production (000 CUM)	686	1,055	1,200	8.9	2.6
Fuel Wood (000 CUM)	476	645	745	6.3	2.9
Compact Plantation (Hectares)	8,500	33,000	40,000	31.2	3.9
Nursery raising (Hectares)	289	375	500	5.3	5.9
Linear plantation (Av. Km)	2,700	2,000	3,500	-5.8	11.8
Distribution of Plants (Million Nos)	35	180	500	38.8	22.7

* percent per annum.

Source: Seventh Five Year Plan, 1988-93.



CHAPTER 2

MARKET SURVEY

Chipboard, also known as particle board, and hardboard are two completely separate industries, manufacturing products for different uses.

Chipboard is mainly used in construction and for furniture joinery. It is generally considered a good substitute for wood and can be put to many uses for which otherwise wood may have been required.

Hardboard on the other hand is a good replacement for plywood. As plywood is becoming more expensive, the use of hardboard as a substitute is increasing. The main uses of hardboard are in the production of furniture items, as planking material for doors, walls, ceiling, roofing, flooring, etc.. It is also used in the transportation industry for making bus interiors, railway passenger bogies, automobile interiors, etc..

With the population explosion the world over the demand for wood and wood-based products is on the increase. This has led to rapid depletion of forests all over the world, particularly in the tropics and in most developing countries.

Pakistan had a low forest cover even at the time of independence which has been shrinking. Currently, the forest cover is five percent of the total geographical area of the Country. Our population is increasing at a rate of 3.1% per annum and is exerting even greater pressure on the scarce resource.

In order to meet the growing demand of produce from the forest resources, it is imperative to make estimates of the present and future consumption of wood in various wood based industries.

This Study has been undertaken to determine the present and future demand for wood in chipboard/particle board and hardboard industries.

2.1 OBJECTIVES OF THE STUDY

The objectives of the Study are :

- o To review all existing documents, reports and statistics on the usage of wood in the Chipboard and other boards manufacturing sector.
- o To identify factors causing market failure, bottlenecks and market constraints.
- o To carry out a survey, based on an agreed sampling plan to be developed on the basis of list of Census of Manufacturing Industries, Chipboard Manufacturers Associations and other related sources.



- o To evaluate the questionnaire developed by Winrock International by subjecting it to field test and/or develop a new questionnaire if the above fails to provide the desired information.
- o To prepare a report on the usage and problems of wood usage in the Chipboard and Other Boards manufacturing sector in the Country.
- o To present the same in a seminar to the Government of Pakistan and USAID Project Personnel.

2.2 RESEARCH DESIGN

As secondary data were limited and incomplete, the major emphasis of the research design has been on primary data collection.

Since the number of manufacturing units in the chipboard/particle board and hardboard industries combined, was less than thirty, therefore, instead of drawing a sample, a census was conducted. List of units surveyed along with addresses is enclosed at Annexure 1.

2.3 POPULATION/SAMPLING FRAME

The population/sampling frame for this survey consisted of all the manufacturing units in Pakistan engaged in chipboard/particle board and hardboard manufacture.

2.4 THE QUESTIONNAIRE DESIGN

A preliminary questionnaire for this survey was provided by Winrock International. The questionnaire was in English and was specially developed for the chipboard and hardboard industries. This questionnaire was exposed to pre-test by the consultants.

2.4.1 PRETESTING OF QUESTIONNAIRE

Pretesting of the preliminary questionnaire was carried out by the consulting team members in Karachi. It was believed that in light of the responses, modifications, if required would be made in the questionnaire to make it more acceptable.

Debriefing sessions were held among team members during which the purpose of survey and the questionnaire were discussed in detail.

A copy of the original questionnaire prepared by Winrock International is enclosed at Annexure 2.



2.4.2 RESULTS OF THE PRE-TEST

The purpose of the pre-test was to check and/or modify the research design and tools of data collection by subjecting him to actual field conditions. As a result of the pretesting, which was carried out in Karachi, a number of modifications were made in the original questionnaire.

2.5 FINAL QUESTIONNAIRE

As a result of the pretesting, a number of changes were made in the questionnaire. The question sequence was altered, many question were reworded and a few questions, which were found to be irrelevant were deleted. A few useful questions were also added. The major changes are as follows.

- Added Question numbers: (in final questionnaire)

5, 17.

- Modified question numbers: (according to the original questionnaire)

5, 7, 9, 11, 14, 15, 16, 17, 19, 20.

The modified questionnaire was sent to Winrock International and a minor modification in question number seven was recommended and incorporated. Copy of finally approved questionnaire is enclosed at Annexure 3.

2.6 SELECTION AND TRAINING OF SURVEYORS

As the number of units in both chipboard/particle board and hardboard industries were few it was decided that in-house staff members would be utilized for conducting the field survey.

There was little need for the formal training of the selected field force, as it consisted entirely of in-house staff members, having considerable experience of field surveys. Only a short briefing session for the purpose was held and scope of work explained.

2.7 FIELD - WORK

Prior to the start of the field work, letters were addressed to the manufacturers' association enclosing the relevant letter of introduction from the Inspector General Forests requesting them to ask their members to co operate for the survey (copy enclosed at Annexure 4). Letters received from the manufacturer's associations addressed to their members were obtained and given to the field force. Copies of these letters are enclosed at Annexures 5 and 6.



2.7.1 PROBLEMS FACED IN FIELD WORK

A few problems were encountered in the field work which are as below:

- o The population, being already small was further reduced, due to the closure of some of the units which were listed as operating. The names of these units are:
- o Pakistan Particle Board Industries, Karachi
- o Partica Limited, Karachi.

Two other units have been sanctioned but they have not yet started operation, namely:

- o Hussain Sugar Mills Limited Jaranwala
- o Premier Sugar Mills Limited Mardan

This also led to reduction in the list of the manufacturing units.

2.8 QUALITY CONTROL AND AUDIT

Although there was little need for quality control and audit, as the entire field work was done by the in-house staff members, including consultants actually working on the project. Yet the routine quality control and audit checks were applied to ensure completeness and accuracy of data.

2.9 DATA CONTROL

At the data control stage, the questionnaires were checked to make sure that complete information was provided. In case, any information was missing or was not in the form required, the respondents were contacted again for the required details.



CHAPTER 3

RESULTS OF THE MARKET SURVEY

3.1 CHIPBOARD/PARTICLE BOARD INDUSTRY

3.1.1 PRODUCTION

At present, there are sixteen (16) units in the country engaged in the production of chipboard with a combined production capacity of 131,500 tons per annum. Out of these, eleven (11) units are using wood as the basic raw material for the manufacture of chipboard while the remaining five (5) units are using bagasse. Two other units namely Hussain Sugar Mills, Jaranwala and Premier Sugar Mills, Mardan have been sanctioned but they have not yet started operations. A map with industries marked is attached as Figure - 1.

The total production of chipboard for the years 1987, 1988 and 1989 is given in Table 3-1.

TABLE 3-1

PRODUCTION OF CHIPBOARD

(IN TONNES)

YEAR	TOTAL INSTALLED CAPACITY	ANNUAL PRODUCTION	% OF TOTAL INSTALLED CAPACITY
1987	127,000	56,478	44.4%
1988	127,000	62,028	48.8%
1989	131,500	63,705	48.4%

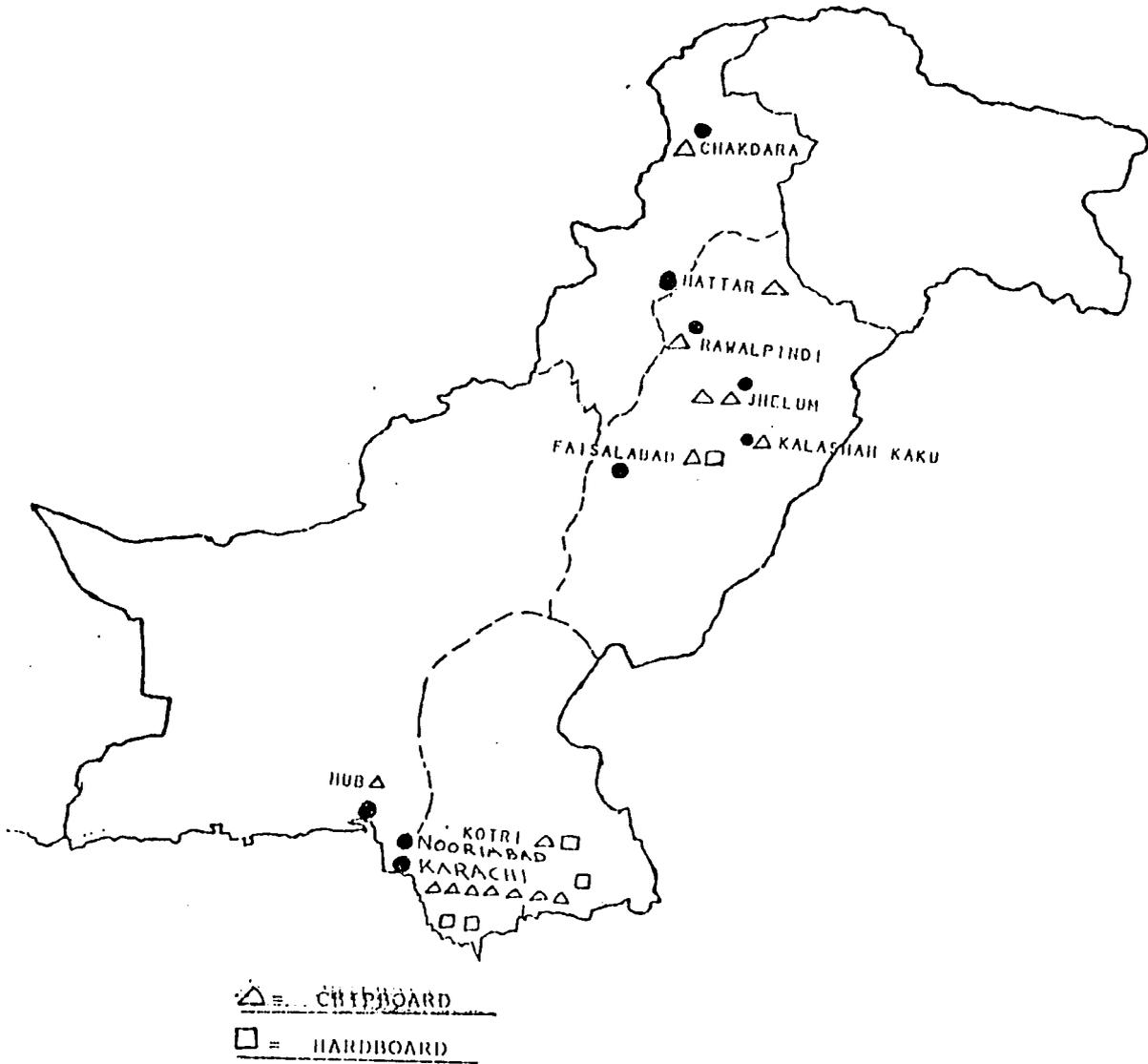
The table above shows that the overall capacity utilization in the chipboard industry has been fairly low, being below 50 percent since 1987.

The reasons for low capacity utilization as cited by the responding units are; the oversupply position of chipboard in the market, second hand machinery of most plants which leads to reduction in efficiency, and to some extent, the shortage of raw materials. Besides these, the overall political instability of the country has also indirectly contributed to the low capacity utilization by reducing the demand for chipboard in the construction and other related industries.



FIGURE - 1

CHIPBOARD AND HARDBOARD
UNITS OPERATING IN PAKISTAN





3.1.2 RAW MATERIALS

3.1.2.1 BASIC RAW MATERIALS

Chipboard is manufactured in Pakistan from wood as well as from bagasse. The latter is mainly used by those units who have their own sugar mills. In other words, bagasse-based chipboard units are a subsidiary/downstream units of the sugar mills.

Bagasse is procured from sugar mills which may have surplus quantity available after consuming majority as fuel. Sugar cane yields about 28% bagasse, half of which is composed dry fibre. Major quantity of bagasse is utilized by the sugar mills as fuel and very little is surplus to their requirements. However some sugar mills do have some spare bagasse available from cane crushing operations.

The wood based units generally use waste wood available in the form of branches, lops and tops of the trees. The main species used in chipboard manufacture are Mango and Poplar. Mango wood comes from orchards which need replacement after older trees have ceased to bear fruits or if the fruit bearing capability is effected by disease. As a result, Mango wood availability is more of an "accident" rather than planned for. This results in periods of shortage of supply especially during the Mango season.

The table below gives the quantity of wood used in the manufacture of chipboard from 1987 to 1989, classified according to the species used:

TABLE 3-2
WOOD-USAGE IN CHIPBOARD INDUSTRY

(IN TONNES)

SR. NO.	WOOD SPECIE	QUANTITY USED					
		1987	% OF TOTAL	1988	% OF TOTAL	1989	% OF TOTAL
1.	MANGO	51,659	60	53,898	61	49,719	57
2.	POPLAR	26,493	31	26,791	30	25,321	32
3.	JANGLI TOOT (Broussonetia paprifera)	-	-	-	-	2,164	2
4.	MIXED WOODS WASTE	8,108	9	7,899	9	7,910	9
	TOTAL WOOD USED	86,270	100	88,588	100	88,105	100

As can be seen from the above table, the demand for Mango wood is the highest, constituting approximately 60 percent of the total wood requirement while Poplar is the next most in demand, constituting approximately 30 percent of the total wood requirement.

One noteworthy point that has emerged from the survey is that in the Province of Sindh, all units use only Mango wood as the raw material while the units in the other parts of the Country have also mentioned using Poplar. One unit in Hattar Industrial Area even mentioned using 'Jangli Toot' (Broussonetia paprifera) growing in abundance in the locality.

5.1.2.2 SOURCES OF WOOD RAW MATERIAL

Out of the 11 wood using chipboard units, 9 units purchase wood only from the middlemen, while one unit namely E.D.C. Board and Plywood (Pvt.) Ltd. purchases wood from both middlemen as well as from forest auctions while the remaining one unit namely Dir Forest Industries Complex purchases only from the forest auctions and from Forest Development Corporation. Dir Forest Industries Complex purchases Deodar, Eoil and Fir/Spruce woods.



All wood raw material used in the manufacture of chipboard is of local origin. There is no imported wood used in this industry.

Further more, the wood is most frequently purchased through the middlemen, namely, the contractors. Generally, the wood is obtained by the contractor who collects it directly from the farmers having orchards/plantations. Farmers remove over-mature or diseased trees which have ceased to bear fruit in order to replace them with new plantations. Some wood is also brought from marginal farm lands. The converted wood from the site is loaded on trucks and brought to the factories.

3.1.2.3 PRICES OF WOOD RAW MATERIAL

As the wood used in the chipboard industry is mostly waste wood consisting of branches, lops and tops of trees, therefore, it is measured by weight and not by linear measure i.e. cubic feet or meters. The most commonly used measure is maundage.

In case of Mango the middlemen, purchase wood either directly farmers or from the local contractors. In case of purchase from local farmers, lump sum deals for entire plantations are made, depending upon the number of trees that are likely to be cut down from it. Some wood is also bought from the local contractors. In such cases, payment is made on the basis of truck load.

Generally, the price per truck load ranges from Rs. 3,000 to Rs. 5,000. As the weight per truck is from 200 to 250 maunds, the average cost to the middlemen works out to Rs. 18 per maund. Including transport and octroi the price of the wood at the factory gate rises (depending on distance) to Rs. 25-30 per maund.



The prices of various species of wood used in the manufacture of chipboard as reported by the responding units is given in Table 3-3.

TABLE 3-3
PRICE OF WOOD RAW MATERIAL

SR. NO.	NAME OF UNIT	WOOD SPECIE USED	PRICE PER MAUND
1.	Anchor Board (Pvt) Limited	Mango	Rs. 30-35
2.	Bombay Plywood Industries	Mango Poplar	Rs. 34 Rs. 28
3.	Dir Forest Industries	Mixed Wood Waste	Not in operation
4.	Hercules Board	Mixed Wood Used	Rs. 22.5
5.	K.D.C. Boards	Mango Poplar	Rs. 45 Rs. 23
6.	Pakistan Chipboard	Mango Poplar	Rs. 32 Rs. 25
7.	Pakitox Board	Mango	Rs. 28
8.	National Particle Board Industries	Mango	Rs. 25-30
9.	Islamabad Board Mills Limited	Mango Poplar Jangli Toot	Rs. 33 Rs. 29.25 Rs. 29.25
10.	Pakistan Superwood Industries	Mango	Rs. 25-35
11.	Sadiq Wood Industries	Mango Poplar	Rs. 50 Rs. 40



As can be seen from the above table, the price of Mango wood ranges from Rs. 25 per maund to Rs. 50 per maund. However, on an average it falls in the range of Rs. 25 to 35 per maund.

The price of Mango wood increases in the Mango season when the fruit is on the trees and so the wood becomes short in supply. This period lasts from March to June. In September also, wood supply is reduced as the trucks prefer to transport sugarcane to sugar mills rather than wood to chipboard factories. This lasts upto April. As such the price of wood keeps on fluctuating throughout the year.

The price of Poplar is lower than Mango ranging from Rs. 23 per maund to Rs. 40 per maund. However, on an average it falls in the range of Rs. 24 to Rs. 28 per maund. The supply of Poplar is more or less consistent throughout the year.

The price of wood raw material has over the years exhibited an increasing trend. Table 3-4 compares the average present prices of various species with their prices in the last year (1988); there is considerable variation in price change experienced by different units.

As can be seen from the table, four units have not experienced any price increase over last year, while three have experienced an increase of 30 to 35 percent and three others have experienced an increase from 7.5 to 15 percent. The remaining one unit has not been in operation for the last two years.



TABLE 3-4

PERCENTAGE-CHANGE IN PRICE OF WOOD

<u>SR. NO.</u>	<u>NAME OF UNIT</u>	<u>WOOD SPECIE</u>	<u>AVERAGE PRICE PER MAUND 1988</u>	<u>AVERAGE PRICE PER MAUND 1989</u>	<u>PERCENTAGE CHANGE</u>
1.	Anchor Board	Mango	25	32.5	30%
2.	Bombay Plywood	Mango Poplar	25.20 20.74	34 28	35%
3.	Dir Forest Industries	Mixed Wood Waste	Not in Operation	Not in Operation	-
4.	Hercules Boards	Mixed Wood Waste	22.5	22.5	0
5.	K.D.C. Boards	Mango Poplar	41.28 21.10	45 23	9%
6.	Pakistan Chipboard	Mango Poplar	27.83 21.73	32 25	15%
7.	Pakitex	Mango	20	20	0
8.	National Particles	Mango	27.50	27.5	0
9.	Islamabad Board	Mango Poplar Jangli Toot	25.40 22.50 22.50	33 29.25 29.25	30
10.	Pakistan SuperWood	Mango	27.90	30	7.5%
11.	Sadiq Wood Industries	Mango Poplar	50 40	50 40	0 0

3.1.2.4 OTHER RAW MATERIALS

Besides wood, which is the basic raw material in chipboard manufacture the other significant raw material used is glue. Most commonly used glue for chipboard manufacturing is the urea formaldehyde type.

The details regarding the use of glue in chipboard industry is given in Table 3-5.



TABLE 3-5

OTHER RAW MATERIALS USED IN CHIPBOARD MANUFACTURE

SL. NO.	NAME OF COMPANY	RAW MATERIAL USED OTHER THAN WOOD	QUANTITY/YEAR (TONNES)
1.	Pakitex Boards	Glue	660
2.	Anchor Boards Ltd.	Glue	360
3.	Pakistan Chipboard	Glue	1200
4.	Sadiq wood Industries	Glue	100
5.	KDC Boards/Plywoods	Glue	2500
6.	Bombay Plywood	Glue	1200
7.	Hercules Boards	Glue	1700
8.	Dir Forest Industries	Glue	136
9.	Islamabad Boards Ltd	Glue	600
10.	National Particles	Glue	480
11.	Pakistan Super Wood	N.A	N.A
TOTAL GLUE USED			8936

As can be seen from the above table, besides wood, which constitutes the main raw material, the other significant raw material is glue. The total quantity of glue used, as given above, comes to about 9,000 tons. Glue used is Urea formaldehyde manufactured in Pakistan by M/s Dyho Pakistan Ltd. and M/s Rapid Ltd.. M/s Hub Petro Ltd. had also been manufacturing this glue but the company has been lying closed for some time. M/s Hoechst Pakistan Ltd. manufacture glue for wood but this glue is used for wood work and carpentry.

Until a few years back, glue had been imported but nowadays most of the glue used is locally manufactured.



3.1.3 PROBLEMS FACED IN WOOD AVAILABILITY

In 1980, there were three units in the Country engaged in the production of chipboard with a combined production capacity of 15,000 tons per annum. In 1982 the number of units increased to eight and it has doubled since then,

making the total number of units sixteen with a combined production capacity of 131,500 tons per year. With this increase in the number of manufacturing units, the demand for the raw material, i.e. wood, has also risen sharply.

Although the shortage of wood is not acute at present, the demand for chipboard is expected to increase in the future, (owing to increase in the population and rising prices of timber) consequently the demand for basic raw material will also increase.

The factory owners are apprehensive that there is likely to be a shortage of wood. Presently, an artificial shortage is created by the middlemen in Mango season to further boost the prices of Mango wood. As such, high inventory has to be maintained to ensure uninterrupted supply of wood. Irregularity and uncertainty of supply has also been cited as a problem by some manufacturing units.

In fact, uncertainty of supply is considered to be such a major problem that some units have adjusted their plants so that they can operate on both wood as well as bagasse.

3.1.4 ESTIMATED FUTURE DEMAND OF WOOD IN CHIPBOARD INDUSTRY

With the rise in per capita GNP, improvement in the standard of living, rapid urbanization as well as rapid growth in population, the demand for wood, furniture and construction materials is expected to grow at an accelerated rate. As Pakistan is not well endowed with forest resources it is likely to run short of its timber requirements in the years to come. Greater reliance will thus be placed on substitutes like chipboard to meet the ever growing demand for timber.

With the increase in the demand for chipboard the demand for wood raw material will also increase.

The estimated demand for various species of wood for 1990, 1991 and 1992 as given by the responding units is tabulated in Table 3-6.



TABLE 3-6

ESTIMATED FUTURE DEMAND FOR WOOD IN CHIPBOARD INDUSTRY

WOOD SPECIE	ESTIMATED DEMAND						ANNUAL GROWTH RATE 1990-92
	1990	% OF TOTAL	1991	% OF TOTAL	1992	% OF TOTAL	
1. MANGO	49,100	55	57,944	57	65,469	59	15.5%
2. POPLAR	28,918	32	30,597	31	31,779	28	4.8%
3. JANGLI TOOT (Brausinausia Paprifera)	2,761	3	3,358	3	4,353	4	25.6%
4. MIXED WOODS WASTE	8,657	10	8,955	9	9,702	9	5.9%
TOTAL WOOD USED	89,436	100	100,854	100	111,303	100	11.6%

It can be seen from the above table that the future demand for Mango wood is expected to be the highest, constituting approximately 57% of the total demand for wood, while Poplar follows next with approximately 30% of the total demand. While it may not be possible to recommend extension of mango plantations for wood production as against its importance as a horticultural tree. Poplar as good substitute can certainly be raised for this pupose as a farm tree.

3.2 HARDBOARD INDUSTRY

3.2.1 PRODUCTION

At present there are five units in the Country engaged in the production of hardboard with a combined production capacity of 84,000 tones per annum. Out of these four units are using wood as the basic raw material while one unit is using bagasse.

The actual production of hardboard from 1987 to 1989 as reported by the responding units is given in Table 3-6.



TABLE 3-7

PRODUCTION OF HARDBOARD

(IN TONNRS)

YEAR	TOTAL INSTALLED CAPACITY	ANNUAL PRODUCTION	% OF TOTAL INSTALLED CAPACITY
1987	60,000	13,301	22.1 %
1988	60,000	19,230	32.0 %
1989	84,000	19,614	23.3 %

It can be seen from the above table that capacity utilization in hardboard industry has been fairly low, averaging around 25%. It however, increased in the year 1988 but again decreased in 1989 due to relative increase in the total installed capacity. A new unit, by the name of M/s Oosman Brothers Hardboard Industries went into trial production in 1989 and has since started commercial production.

3.2.2 RAW MATERIALS

3.2.2.1 BASIC RAW MATERIAL

Hardboard is manufactured in Pakistan from both wood as well as bagasse. Out of five units, one unit namely, Crescent Boards Limited, is using bagasse for manufacturing hardboard while the remaining four units are using wood.

The most commonly used wood for hardboard manufacture is *Acacia nilotica* commonly known as Kikar. The grade of Kikar used comes under the category of waste wood. A new unit M/s Oosman Brothers Hardboard Industries has started using a new species namely *Eucalyptus* which also comes under the category of waste wood.

The wood used is usually purchased in the form of branches, lops and tops of trees. Table 3-7 gives the quantity of wood used in the manufacture of hardboard from 1987 to 1989, classified according to the species used.



TABLE 3-B

WOOD USAGE IN HARD BOARD INDUSTRY

(IN TONNES)

SPECIES	1987	% of TOTAL	1988	% of TOTAL	1989	% of TOTAL
1. Acacia nilotica (Kikar)	29,776	100	34,279	100	33,895	96.7
2. Eucalyptus					1,166	3.3
TOTAL WOOD USED	29,776	100	34,279	100	35,061	100

It can be seen from the above table that upto 1988, the only wood used for wood based hardboard was kikar. However, since 1989, one of the companies namely M/s Oosman Brothers Hardboard Industries have started using Eucalyptus as well.

3.2.2.2 SOURCES OF WOOD RAW MATERIAL

As for chipboard industry, the wood for hardboard industry is also supplied by the middlemen. All the four wood using hardboard units have mentioned purchasing wood from the middleman. One unit, however, namely Oosman Brothers Hardboard Industries using Eucalyptus has mentioned purchasing wood from both middlemen as well as directly from the tree growers.

As all hardboard manufacturing units, except Crescent Boards Limited which uses 'Bagasse', are located in the Province of Sindh the wood used in this industry also comes from the interior of Sindh mainly from Matli, Mirpur Khas, Tandoala Yar, Nawabshah, etc.. This is clearly a case for extension of hurris as a regular farm practice in agricultural lands in these districts.

The contractor/middlemen collects wood from the local contractors, who bring it in lots of 10-20 maunds. When enough wood is collected it is brought to the factories. Mostly the wood is loaded at Badin, from where it reaches the factories.



3.2.2.3 PRICES OF WOOD RAW MATERIAL

As in chipboard industry, the wood used in this industry is also purchased by weight namely maundage.

In case of Kikar, the wood is purchased by the middleman or the contractor from the local contractors in small lots of 10 to 20 maunds. The price paid by the middlemen ranges from Rs. 12 to Rs. 14 per maund. Adding transportation costs, octroi, district (zila) tax, and other costs, the price at factory gate ranges from Rs. 18 to Rs. 23. The prices of wood usually goes up in the sugar cane crushing season, when the transporters prefer to carry sugar cane rather than wood and in the seasons when demand for firewood increases, namely, marriage season, Moharram, etc..

In case of Eucalyptus, the wood is at the moment only used by one unit. This unit purchases wood from both tree growers as well as from the middlemen/contractors. In case of tree growers the wood is presently being purchase at a price of Rs. 25 per maund at factory gate. The cost at site is on an average Rs. 16 per maund. Adding transportation, octroi and other charges paid by the tree grower the price at factory gate becomes on an average Rs. 25. The wood purchased through the middlemen costs a bit higher. Usually the tree growers get the same price that is Rs. 16 per maund but as the wood is delivered by the middleman he charges a commission in the range of Rs. 1.0 to 1.5 per maund which raises the price at factory gate to Rs. 26 to Rs. 26.50 per maund.

The prices of various species of wood used in hardboard manufacture as reported by the responding units is given in Table 3-9.



TABLE 3-9

PRICE OF WOOD RAW MATERIAL

SR. NO.	NAME OF UNIT	WOOD SPECIE USED	PRICE PER MAUND
1.	Asia Board Industries	Kikar	Rs. 22-24
2.	Fibretext Industries	Kikar	Rs. 19
3.	Pak Hardboard Industries	Kikar	Rs. 32
4.	Oosman Brothers Hardboard Industries	Eucalyptus	Rs. 23

The prices of woods used in this industry have been on the increase. The table below compares the current prices with the prices prevailing the year before.

TABLE 3-10

PERCENTAGE-CHANGE IN PRICE OF WOOD

SR. NO.	NAME OF UNIT	WOOD SPECIE	AVERAGE PRICE PER MAUND IN 1988	AVERAGE PRICE PER MAUND IN 1989	PERCENTAGE CHANGE
1.	Asia Board Industries	Kikar	20.95	22	5%
2.	Fibretext Industries	Kikar	18.09	19	5%
3.	Pak Hardboard Industries	Kikar	26.66	32	20%
4.	Oosman Brothers Hardboard Industries	Eucalyptus	15.86	23	45%

As can be seen from the above Table the price increase experienced by two Kikar wood using units has been the same that is 5% while one Kikar wood using unit has experienced a price increase of 20%. The price of Eucalyptus has also risen sharply going up by 45%.



3.2.2.4 OTHER RAW MATERIALS

The main constituent of wood-based hardboard is wood itself. Other raw materials include chemicals and water which constitute about 5% of the total cost of production.

3.2.3 PROBLEMS FACED IN WOOD AVAILABILITY

Of four units using wood, two have stated that they do not face any problem in wood availability. However, one unit has mentioned that the supply of wood is unorganized and erratic.

3.2.4 ESTIMATED FUTURE DEMAND OF WOOD IN HARDBOARD PRODUCTION

The demand for wood raw material in hardboard production is directly dependent on the demand for the finished product. As there is still some import of hardboard in the Country it implies that there is room for increasing local production. Consequently with local production increasing in the future the demand for wood raw material will also increase. The estimated future demand for various species of wood for 1990, 1991 and 1992 as given by the responding units is given in Table 3-11.

TABLE 3-11

**ESTIMATED FUTURE DEMAND FOR WOOD IN HARDBOARD INDUSTRY
(IN TONNES)**

WOOD SPECIES	ESTIMATED DEMAND						GROWTH RATE 1990-92
	1990	% age of Total	1991	% age of Total	1992	% age of Total	
Acacia Nilotica	36,123	72	40,784	65	41,716	66	7.4%
Eucalyptus	14,128	28	21,493	35	21,493	34	23.4%
Total Demand	50,451	100	62,277	100	62,277	100	11.1%

The above table indicates that the demand for wood raw material in 1991 is likely to increase by 23% over 1990 whereas, it would remain more or less the same for 1992.



3.2.5 WOOD WASTE AND ITS USE

There is a significant quantity of wood wastage produced in chipboard and hardboard industries. The wood waste is usually in the form of sawdust. Most of the units have not been able to give the exact volume of waste produced. Even in cases where some responses have been received, they cover a considerable range from 10% to as high as 33%. The responses given by the units are given in Table 3-12.

It can be seen from the table the principal form of wood waste is saw dust.

Of the fifteen (15) wood using chipboard and hardboard units, seven (7) have stated that there is no use of this wood waste. Four (4) others responded that the waste is used as fuel for cooking out of the remaining four, two supply it, to poultry farms, one supplies waste for brick making and one for Agarbatti making.

All units except one have stated either giving it free or for a very negligible amount.

The prevailing situation raises the need to investigate the possible and profitable uses of this waste. The reason being that even if 10 percent of the total industry wood requirement is wastage, it turn out to be a considerable amount which can be put to some useful purpose.

3.2.6 MANPOWER IN CHIPBOARD AND HARDBOARD INDUSTRIES

There are a total of 3,322 persons employed in chipboard and hardboard industries. Of these, only 162 persons (4.9%) belong to the managerial level, 339 persons (10.2%) are office workers/clerks and the remaining 2892 (84.9%) are workers, 71% are permanent while about 13.9% are contract workers. Table 3-13 gives the company-wise break-up of the workers.



TABLE 3-12

WOOD WASTAGE IN CHIPBOARD AND HARDBOARD INDUSTRIES

SR. NO.	NAME OF COMPANY	CURRENT VOLUME OF WOOD WASTE	FORM OF WOOD WASTE	USES OF WOOD WASTE	SELLING PRICE (IN RS.)
1.	Pakitex Boards Limited	N.A	Wood Dust	N.A	N.A
2.	Anchor Boards Limited	20 tons	Saw Dust	Full for cooking	Negligible
3.	Pakistan Chipboard	N.A	Saw Dust	No Use	N.A
4.	Sadiq Wood Industries	206 tons (33% of total wood)	Small Pieces	Fuel	Nothing
5.	K.D.C. Boards & Plywood (Pvt) Limited	N.A	Saw Dust	N.A	N.A
6.	Bombay Plywood Industries	1200 tons	Saw Dust	For Making Bricks	375/tons
7.	Hercules Boards Limited	N.A	N.A	N.A	N.A
8.	Dir Forest Industries Limited	N.A	N.A	N.A	N.A
9.	Islamabad Boards Mills Limited	N.A	N.A	Fire Waste	Free of Cost
10.	National Particle Boards (Pvt) Limited	N.A	Wood Dust	Poultry Farm Users	Free of Cost
11.	Pakistan Superwood Industries	N.A	Sanding Dust	Fuel, Agarbati Manufacture	Free of Cost
12.	Oosman Brothers Hardboard Industries	148 tons (10% of total wood)	Pith Particles Saw Dust	Fuel	Free of Cost
13.	Pakistan Hardboard	140 tons (27% of total wood)	N.A	N.A	N.A
14.	Fibretex Industries (Pvt) Limited	N.A	N.A	N.A	N.A
15.	Asia Boards Limited	N.A	Saw Dust Wood Pieces	Poultry Farm Use	Negligible



TABLE 3-13

COMPANY WISE BREAK-UP OF MANPOWER

S.NO.	NAME OF COMPANY	MANAGERIAL	CLERICAL	P.W	C.W	TOTAL	Manpower Output Ratio for 1980
1	Dir Forest Industries Limited	38	13*3	384	4	559	-
2	K.D.C. Boards & Plywood (Pvt.) Limited	15	25	500	-	540	10.31
3	Crescent Boards Limited	40	45	260	-	345	39.90
4	Fibretext Industries (Pvt.) Limited	15	5	200	-	220	38.33
5	Sind Particles Boards Mills Limited	1	38	76	105	220	25.65
6	Pakistan HardBoard	6	8	165	-	179	33.75
7	Bombay Plywood Industries	5	12	90	65	172	11.56
8	Asia Boards Industries Limited	3	10	25	125	163	25.20
9	Oosman Brothers Hardboard Industries	1	10	90	20	121	5.68*
10	Balochistan Particles Industries	9	7	104	-	120	79.42
11	Partico (Pvt.) Industries Limited	3	7	80	15	105	26.31
12	Pakistan Chipboard	6	10	80	-	96	53.62
13	Pakistan Superwoods Industries	5	6	70	8	89	26.89
14	Islamabad Board Mills Limited	3	5	43	26	77	27.89
15	Sadiq Wood Industries	3	3	45	15	66	34.37
16	Pakitex Boards Industries	1	3	40	20	64	36.60
17	Anchor Boards (Pvt.) Limited	1	2	30	30	63	60.00
18	Garibsons (Pvt.) Limited	2	5	30	7	44	114.10
19	National Particle Boards (Pvt.) Limited	-	3	29	10	42	40.31
20	Hercules Boards Limited	5	2	20	10	37	84.00

* The Company had just begun its operations in 1989.



3.2.7 COST OF WOOD TO MIDDLE-MEN

To get a complete picture of the prices of the wood to the industrial units, visits were paid to some middle-men and the octroi post in Karachi at Wazir Mansion. Discussions were held with different middle-men and transporters of wood. The wood coming to Karachi is mostly from Badin and Nawab Shah. Prices of wood and the break-up of other costs are given in Table 3-14.

TABLE 3-14

COST OF WOOD AND OTHER RELATED COSTS

DESCRIPTION	NAWAB SHAH	BADIN
Cost of wood from primary supplier	Rs.12-14/ maund	Rs.12/ maund
Transportation	6-7/maund	5-6/maund
Loading	250/truck	200-250/ truck
Pass expenses	100/truck	100/truck
Truck commission	20	20
Zila tax	200-300/ truck	225/ truck
Octroi	90-100/ truck	90-100/ truck
Unloading	60	60

Based on the above figures, it appears that the margin for the middleman is quite low and is usually below 10% currently. Only at certain times does it exceed this, averaging at 10-20 percent.

On inquiring why the contractors were willing to operate at such low margins, it was discovered that they dealt mainly with quality timber and waste wood supplied to chipboard and hardboard factories was either left overs or carried to hide the quality timber as it is charged at lower octroi rates.



3.2.8 LASANI WOOD

Al-Noor Sugar Mills in Pakistan, have set up a plant to manufacture medium density fibreboard, having minimum density of 700 Kg./M³. Although this product is manufactured from bagasse it is much superior in quality to chipboard and unlike chipboard, it does not need any veneer. In fact, for all practical purposes, it is a substitute for wood and like good quality wood it can be polished, carved, painted, etc.. Moreover, it has a distinct advantage over wood, as it has the same strength properties in all directions and hence does not warp or twist.

Unfortunately, this product, so far, has not found much favour in our wood using industries. Although it is 40 % cheaper compared to a good quality wood like Deodar but the market is skeptical about its virtues and is reluctant to put it in use where good quality wood may be required. It has also not been accepted in the chipboard market, as its price is higher than chipboard.

However, it is a good product, and being a good substitute for wood it can go a long way in relieving the demand pressure on our meagre forest resource.

3.2.9 CONCLUSION

Results of the market survey indicate that at present the choice of wood species being used in the manufacture of chipboard and hardboard is very limited and confined to Mango, Poplar, Kikar and Eucalyptus.

All of these woods fall under the category of fire wood and low grade timber and are widely grown in farm lands and Government forests. Consequently, these industries have not faced any acute raw material supply problem so far. Added to this is the fact that certain units have the material. However, the demand for these woods is likely to increase in the future with the increase in the demand for the finished product.



CHAPTER 4

4.0 FINDINGS AND RECOMMENDATIONS

4.1 FINDINGS

The analysis of the primary and the secondary data available on the chipboard and hardboard industries has led to the following conclusions:

- 4.1.1 The installed production capacity in both chipboard and hardboard industries is more than the present local demand. As such, the capacity utilization in both these industries is fairly low, being 48.4 and 23.3 percent respectively. Because of low capacity utilization, the fixed costs for both these industries are high, leading to higher production costs per unit and consequently higher unit selling price of the finished product.
- 4.1.2 Most of the wood raw materials used in both these industries consists of "low grade wood" for which the only other competing demand is as fire wood, except for Mango which is also used in furniture.
- 4.1.3 The major source of supply of wood for these industries are the private plantations/orchards and the marginal farmlands. From both these sources the wood is delivered to the factories by the middlemen. These middlemen are retaining a margin of 10-20 percent on an average.
- 4.1.4 The availability of wood is seasonal, especially in case of Mango wood as the same becomes available during off season only. This forces the industries to incur substantial extra cost on account of storage of wood to ensure steady supply for production.
- 4.1.5 Although there is no acute wood raw material supply problem in these industries at present, however, the industrialists are apprehensive that there is likely to be a shortage of wood in the future.
- 4.1.6 As stated earlier, there is no shortage of wood for both these industries at present, however this position is likely to change in the next 4-5 years due to expected increase for these products and increased competition from fire-wood usage. This may result in increasing the cost of raw materials for these industries.



4.2 RECOMMENDATIONS

On the basis of the above findings, the following recommendations are being made:

- 4.2.1 The wood-usage in these industries is presently restricted to a very few species namely; Mango, Kikar and Poplar with a few units using Jangli Toot and Eucalyptus. A wide variety of other species are available throughout the Country in particular Eucalyptus which is now widely grown in farm forestry as well as in Government plantations. Pakistan Forest Institute can play an important role of testing and supplying of information to the Industry regarding other easily available species which can be used as raw materials in these industries.
- 4.2.2 Fast-growing wood species suitable for these industries should also be grown so as to ensure regular supply of raw material for these industries. Besides, the use of baggasse as raw material should also be encouraged as it can greatly help in conserving our meagre forest resources.
- 4.2.3 Import of timber is presently restricted to a few superior quality timbers used for decorative or special industrial purpose. Large quantities of a wide variety of low grade timbers can be available from forest-rich countries like Burma, Thailand, Indonesia, Malaysia and certain countries of Africa, which could easily be made available to the industry at a reasonable cost. For this purpose, the import of timbers and its duty structure needs to be liberalized. The effect of the this measure will be felt once the industries attain higher capacity utilization through exports and availability of local material diminishes.
- 4.2.4 In Sind, where growing of 'houris' has been a traditional practice aimed originally at improving the productivity of agricultural lands, can also be introduced to other provinces like Southern areas of Punjab, NWFP and Baluchistan, where 'Kikar' may find an equally hospitable climate, for growth. This would help in easing the supply problem for hardboard manufacturers.
- 4.2.5 A local hardboard unit has successfully introduced the use of Eucalyptus for hardboard manufacture. The Forestry department should further investigate its potential usage and supply relevant information to the industry.
- 4.2.6 The Forestry department should take up a more active role as being an information disseminator between the tree farmers and the end users, and supply the farmer, with necessary information a part from the nursery stock and which species have commercial application which would be profitable for the growers to grow. Besides the government



should provide necessary incentives to boost up the farm forestry programme such as providing rebate in water rates, land revenue less for raising of tree crops on agricultural land.

4.2.7 As the capacity utilization in these industries is presently very low, therefore, efforts should be made to increase the capacity utilization. This can be done by both stimulating the local demand and tapping the export market potential.

4.2.8 As both chipboard and hardboard are high value added items, being manufactured from low grade woods and baggasse which is a waste product, therefore, they can be a substantial source of foreign exchange earning for the Country if exported. For this, however, the quality of the finished products have to be improved. Some hardboard manufacturing units have started exporting hardboard to Middle East and African countries.

It follows, therefore, that export potential does exist and appropriate steps in this direction need to be taken by both the manufacturers as well as the Government.

4.2.9 In collaboration with the concerned Manufacturers' Association, research projects should be initiated to evaluate the feasibility of other agricultural waste materials such as wheat and cotton stalks, rice husk, river grass, etc. for use in the chipboard and hardboard manufacturing industries.

4.3 AREAS FOR FURTHER INVESTIGATION

While the results of the study have revealed a number of important facts, it has also highlighted areas where there are information gaps that need to be filled. An attempt has been made to identify these areas and the issues that require further investigation.

4.3.1 ROLE OF MIDDLEMEN

The study has revealed that the major source of supply of wood for these industries are the private growers. The wood is delivered to the factories by the middlemen, who collect wood from various growers. As such, the middlemen play a very important role in the supply of wood raw material. In fact, the industries are totally dependent on them and as such, the middlemen are in a controlling position. Artificial shortages are at times created by the middlemen in order to boost the prices of wood raw material, leading to increases in the cost of production. It is important, therefore, to clearly identify the role these middlemen play in the supply of wood and to identify alternatives if any, that can be developed to ensure regular flow of raw material to the industries.



WOOD USING INDUSTRIES OF PAKISTAN
WOOD CONSUMPTION SURVEY QUESTIONNAIRE
CHIPBOARD INDUSTRY

Serial No. _____
Date _____

1. Name and Address of the firm

2. Year the firm was established _____

3. Indicate which stages of wood processing are done by your firm

Stage of Processing	By My Firm
Harvesting trees	_____
Transporting logs	_____
Debarking logs	_____
Sawing or slicing logs	_____
Fabricating wood products	_____
Finishing wood products	_____
Wholesale distribution	_____
Retail distribution	_____

4. Please list what you consider to be the four main pieces of equipment that you use in this enterprise, its size and the number that you have.

	Equipment Type	Equipment Size	Number Used
#1.			
#2.			
#3.			
#4.			



ANNEXURE - 2

ORIGINAL QUESTIONNAIRE
(PREPARED BY WINROCK INTERNATIONAL)



11. Dir Forest Industries
Complex
Head Office: P.I.D.C House
M.T. Khan Road, Karachi
12. Islamabad Board Mills
(Pvt) Limited
Plot No. 15, Hatter Industrial
Estate, Hattar, NWFP 0595-8293
051-68374
13. National Particle Board
(Pvt) Limited
Korangi Industrial Area, Karachi 330766
14. Pakistan Superwood
Industries (Pvt) Limited
31, Landhi Industrial Area 330682
Karachi
15. Partico (Pvt) Limited
4th Floor, UBL Building 3413533
I.I. Chundrigar Road, Karachi 3412733
16. Qosman Brother Hardboard
Industries
Korangi Industrial Area
Plot 12 & 13, Sector 16 310545
Karachi
17. Pak Hardboard Industries
Plot No. 9 & 24, Sector 29, 310544
Korangi Industrial Area, Karachi 310563
18. Fibretex Industries Ltd.
Rehmat Manzil, Kaka Street 721301
Siddiq Wahab Road Timber Market 735443
Karachi
19. Asia Board Industries
Limited
Central Chambers 734530
Ireland Road, P. O. Box 1332 735163
Karachi
20. Crescent Boards Limited
Faisalabad (Hishotabad) 50201



ANNEXURE - 1

LIST OF OPERATING CHIPBOARD AND HARD BOARD MANUFACTURERS
COVERED IN THE SURVEY

SNO.	NAME/ADDRESS OF COMPANY	
1.	Baluchistan Particle Board Limited 2nd Floor Imperial Court Dr. Ziauddin Road, Karachi	511543
2.	Pakitec Boards Plot 24 & 25, Sector 29, Korangi Industrial Area, Karachi	330996
3.	Anchor Boards (Pvt) Ltd. Korangi Industrial Area, Karachi	311778
4.	Pakistan Chipboard Limited Main G.T Road, Jhelum	2795/2796
5.	Sadiq Wood Industries (Pvt) Limited Kala Shah Kaku	700234 700334
6.	KDC Board & Plywood (Pvt) Limited Head Office, G.T Road P. O. Box 13, Jhelum	05941-2979 05941-2980
7.	Bombay Plywood Industries Peshawar Road, Rawalpindi	86216P, 86216E
8.	Sind Particle Board Hills Limited S.I.T.E Kotri (Factory) Tibet Square H.A. Jinnah Karachi (Office)	221971 221975
9.	Garib Sons (Pvt) Limited E/23 S.I.T.E Karachi	290604, 290603, 5
10.	Hercules Board Limited Jubilee Insurance House I.I. Chundrigar Road, Karachi	2419540



FOR 1990

	SPECIES NAME	INITIAL FORM	SOURCE	QUANTITY IN cft, m ³ , md
1.	_____	_____	_____	_____
2.	_____	_____	_____	_____
3.	_____	_____	_____	_____
4.	_____	_____	_____	_____

Q7. Please indicate your current and the estimated future consumption of your four most used woods for 1991 and 1992.

	SPECIES	GRADE	CURRENT	1991	1992
1.	_____	_____	_____	_____	_____
2.	_____	_____	_____	_____	_____
3.	_____	_____	_____	_____	_____
4.	_____	_____	_____	_____	_____

Q8. From whom do you purchase wood?

Tree grower _____ Forest auction _____
 Middle man _____ Own lands _____
 Any other (please specify) _____

Q9. How is wood delivered to your factory? (Please Check all that apply)

_____ Railway _____ Waterway
 _____ Truck _____ Push cart
 _____ Animal cart
 Any other (please specify) _____



Q5. Is wood one of the raw material used in the manufacture of your products?
 ___ YES ___ NO --> GO TO Q16

Q6. What has been your actual wood requirement since 1987, in terms of species used, initial form of purchase, source (local or imported) and the quantity required.

FOR 1987

	SPECIES NAME	INITIAL FORM	SOURCE	QUANTITY IN cft, m ³ , md
1.	_____	_____	_____	_____
2.	_____	_____	_____	_____
3.	_____	_____	_____	_____
4.	_____	_____	_____	_____

FOR 1988

	SPECIES NAME	INITIAL FORM	SOURCE	QUANTITY IN cft, m ³ , md
1.	_____	_____	_____	_____
2.	_____	_____	_____	_____
3.	_____	_____	_____	_____
4.	_____	_____	_____	_____

FOR 1989

	SPECIES NAME	INITIAL FORM	SOURCE	QUANTITY IN cft, m ³ , md
1.	_____	_____	_____	_____
2.	_____	_____	_____	_____
3.	_____	_____	_____	_____
4.	_____	_____	_____	_____



Q1. Please indicate which stages of wood processing are carried out by your firm

STAGES OF PROCESSING

- _____ Harvesting trees
- _____ Transporting logs
- _____ Debarking logs
- _____ Sawing or slicing logs
- _____ Fabricating wood products
- _____ Finishing wood products
- _____ Wholesale distribution
- _____ Retail distribution

Q2. Please list the four main pieces of equipment that you use in this enterprise, their make, size and the number installed.

	EQUIPMENT TYPE/MAKE	EQUIPMENT SIZE	NO. INSTALLED
1.	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____
4.	_____	_____	_____

Q3. What are the four primary products you manufacture and their annual production since 1987 to 1989.

	PRODUCT TYPE	NO. PRODUCED PER YEAR		
		<u>1987</u>	<u>1988</u>	<u>1989</u>
1.	_____	_____	_____	_____
2.	_____	_____	_____	_____
3.	_____	_____	_____	_____
4.	_____	_____	_____	_____

Q4. At what percent of capacity are you operating at present ?

_____ %



CLIPBOARD/HARDBOARD AND PARTICLE BOARD SURVEY

Q. NO. _____

NAME OF COMPANY : _____

ADDRESS : _____

TELEPHONE NO. : _____ CITY : _____

YEAR OF ESTABLISHMENT : _____

RESPONDENT'S NAME : _____

DESIGNATION : _____

INTERVIEWER'S NAME : _____ DATE : _____

=====

DATA ENTRY	DATA CONTROL	DUMP CHECK
Remarks: _____	Remarks: _____	Remarks: _____
Sign: _____	Sign: _____	Sign: _____
Date: _____	Date: _____	Date: _____

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ANNEXURE - 3

FINAL QUESTIONNAIRE



14. Current and Future Consumption of your four most used woods.
(Use actual this year and best estimates thereafter)

Species	Grade	1990	1991	1992
#1.				
#2.				
#3.				
#4.				

15. What significant other materials are used in connection with your wood based product? (e.g. if wood is your fuel are there other fuels used, if it is a part in fabrication what are the other parts?)

Material	Quantity: Tonnes/year
#1.	
#2.	

16. Annual Volume of Wood Waste _____ (Units?)

Principal Form of Wood Waste _____

Uses of Wood Waste _____

Sale price/Unit of waste _____

17. What is the distribution of your costs of production?

Wood raw material	_____ %
Labor costs	_____ %
Other operating costs	_____ %
TOTAL	100 %

18. What is your gross annual value of sales in Rs?

19. How many man-years of employees does your establishment employ in an average year?
(include all managers, professionals, staff, and laborers)

_____ man-years

20. Please note any other relevant information from the interview not covered elsewhere in the questionnaire.
(Use reverse side if necessary)



9. How much do you pay for wood raw material per unit at the factory gate for the four primary species and grades used:

<u>Species</u>	<u>Grade</u>	<u>Local Rs/Unit</u>		<u>Imported Rs/Unit</u>
		<u>Fern lands</u>	<u>State lands</u>	
#1.				
#2.				
#3.				
#4.				

10. Are your average per unit wood costs the same as last year?

Choose one: UP + %
 THE SAME - 00 %
 DOWN - %

11. From whom is wood purchased? _____

(Tree grower, forest auction, middle man, own lands, etc.)

12. If your primary supplier is an individual please list his name and address here:

13. Please describe any wood availability problems that you now have or expect to have next year:



5. What was the Annual Production of your four primary products:

Product Type	No. Produced per Year		
	1987	1988	1989
#1.			
#2.			
#3.			
#4.			

6. What Per Cent of Capacity are you operating at? _____ %

7. Actual wood requirement since 1986:

Year	Species Used		Wood Volume Used cft, m ³ or maund	Initial Form of Wood Used*
	<u>Local</u> <small>Farm lands State lands</small>	<u>Imported</u>		
1987				
1988				
1989				
1990				

* (scants, log wood, branch wood, lumber, etc.)

8. How is wood delivered to your factory? (Please Check all that apply)

- | | |
|------------------------------------------|---------------------------------------|
| <input type="checkbox"/> Railway | <input type="checkbox"/> Waterway |
| <input type="checkbox"/> Truck | <input type="checkbox"/> Push cart |
| <input type="checkbox"/> Animal cart | <input type="checkbox"/> Hand carried |
| <input type="checkbox"/> Other (_____) | |



ANNEXURE 6

TELE : 734580

**PAKISTAN HARDBOARD MANUFACTURERS
ASSOCIATION**

*Central Chambers,
Ireland Road,
P. O. Box No. 1202,
Karachi.*

Our Ref.No.PHHA/CHHN/786/101/1990

K a r a c h i : 26th June,1990

TO WHOM IT MAY CONCERN

Messrs. National Management Consultants (NMC)
are conducting a survey on behalf of the
Forestry Department, Government of Pakistan.

The survey is aimed at determining Wood
Consumption trends in Chipboard, Hardboard,
Particle Board and other Boards Industries.

All Members are requested to extend their
full co-operation to NMC.

For PAKISTAN HARDBOARD MANUFACTURERS ASSOCIATION.


(ABDUL AZIZ HAJI YAQOOB)
Chairman.



ANNEXURE - 6

LETTER OF INTRODUCTION FROM PAKISTAN
HARDBOARD MANUFACTURERS' ASSOCIATION



ANNEXURE 5

All Pakistan Particleboards Manufacturers Association

45, SHAHRAN-E-QUAID-E-AZAM, LAHORE. TELEX : 44445 CGS PK. PHONE : 53029, 53065

REF. NO. APMA/GEN./311

DATED 27th June, 1990

ALL WORTHY MEMBERS

Subject:- SURVEY ON WOOD CONSUMPTION IN
CHIPBOARD/HARDBOARD, PARTICLE
BOARD AND OTHER BOARDS INDUSTRIES

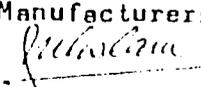
Dear Sirs:

M/s. National Management Consultants are carrying survey of particleboard manufacturing industry with collaboration of Forest Division, Government of Pakistan with a view to determine the magnitude of wood consumption in chipboard, hardboard and other Boards Industries which will enable the Government in developing appropriate policy measures to ensure regular and proper supply of wood for the particleboard industry.

We hope you would be kind to accommodate representative of National Management Consultants on visit to you in connection with afore-mentioned purpose as it will be beneficial to the industry as a whole.

Thanking you,

Yours faithfully,
For All Pakistan Particleboards
Manufacturers Association.,


S E C R E T A R Y.

M₂**.



ANNEXURE - 5

LETTER OF INTRODUCTION FROM ALL PAKISTAN
PARTICLE BOARD MANUFACTURERS' ASSOCIATION

ANNEXURE 4

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

Telephone No.

Telex No. 5844 MINFA PK
Telegram: AGRIDIV

D.O. No.
Government of Pakistan
Ministry of Food, Agriculture
and Cooperatives
(Food & Agriculture Division)

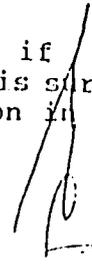
Islamabad, the 10.6.90.....19

TO WHOM IT MAY CONCERN

Under the Forestry Planning & Development Project of the Government of Pakistan and USAID, a study has been designed to collect data on the present wood consumption trends and future demands of woody raw materials in Pakistan. This survey is being undertaken specifically to gain an understanding of wood production-wood consumption trends related to wood produced on private farm and state lands that might be supplied to industrial users on a sustained basis. On the basis of this survey future demands by the Industry will be ascertained and a private Farm Forestry action plan to grow the required species will be duly prepared.

National Management Consultants (NMC) have been selected as to collect nation wide information in this regard for the Chipboard, Hardboard, Particle Board and Other Boards industries.

The Government of Pakistan would appreciate it if the representatives of NMC are extended full cooperation in this survey so that they are able to collect the relevant information in the shortest possible time.



10.6.90

Abeedullah Jan
I.G. Forests



ANNEXURE 1

LETTER OF INTRODUCTION FROM THE
INSPECTOR GENERAL, FORESTS



Q15. Are your average per unit wood costs the same as last year?

Increase by _____% Same _____

Decrease by _____%

Q16. What is the distribution of your costs of production?

Wood raw material _____%

Other raw materials _____%

Labor costs _____%

Other operating costs _____%

TOTAL 100 %

Q17. Have you made any major technological changes that have affected your basic raw material used? YES / NO

Please give details:

Q18. What is your gross annual value of sales? Rs. _____

Q19. What is the category-wise break-up of your total manpower?

<u>CATEGORY</u>	<u>NO. OF EMPLOYEES</u>
Managerial	_____
Clerical	_____
Permanent workers	_____
Casual workers	_____

Q20. Would you like to make any other comment/suggestion regarding wood-usage in your industry?

THANK YOU



Q10. How much do you pay for wood raw material (per unit), at the factory gate, for the four primary species and grades used:

	<u>SPECIES</u>	<u>GRADE</u>	<u>LOCAL RS/UNIT</u>	<u>IMPORTED RS/UNIT</u>
1.	_____	_____	_____	_____
2.	_____	_____	_____	_____
3.	_____	_____	_____	_____
4.	_____	_____	_____	_____

Q11. If your primary supplier is any particular individual, please give his name and address.

Q12. Please describe any wood availability problems that you now have or expect to have next year:

Q13. What other significant raw materials are used in the manufacture of your wood based product?

	<u>MATERIAL</u>	<u>QUANTITY: TONNES/YEAR</u>
1.	_____	_____
2.	_____	_____

Q14. Does your factory produce any wood waste? Y/N. If yes:

- i) What is the annual volume of wood waste _____ (Units?)
- ii) What is principal form of wood waste _____
- iii) What are the uses of wood waste _____
- iv) What is your sale price/unit of waste _____



5.0 "HARDBOARD INDUSTRY: VICTIM OF INDISCRIMINATE IMPORTS"
PAKISTAN AND GULF ECONOMIST REPORT, MARCH 1987.

Pakistan and Gulf Economist published a report on the Hardboard Industry in March 1987. According to this report, Pakistan's hardboard industry is facing severe problems.

Against total annual demand of 45,000 tons, the installed capacity is 60,000 tons while two more units with additional 39,000 tons capacity are in the process of completion.

Import of hardboard, however, is on the rise mainly because the imported hardboard is available now even cheaper than local one due to underinvoicing and reduction in import duty and sales tax.

Import duty was reduced from 120 percent to 80 percent in the 1986-87 budget while sales tax was reduced from 20 percent to 12.5 percent.

On top of this there is extensive underinvoicing being practiced by the importers. Investigations have revealed that while prices of 3mm thick hard board from USSR (C & F Karachi) is US\$ 65 per 1000 Sq. Ft., the same is imported and declared by importers at between US\$ 32-35 per 1000 Sq. Ft.

Due to this underinvoicing and lower duty structure, the locally manufactured hardboard has lost the price advantage it had.

TABLE 1

PRICE OF HARDBOARD (PER Sq. Ft.)

Landed Cost under old duty structure	Landed Cost under present structure	Local Cost
3.259 (actual)	Rs. 2.531 (actual)	1.50
1.655 (under invoiced)	Rs. 1.285 (under invoiced)	1.50

(Based on 50% underinvoicing which is common)

Under present situation, the price advantage has shifted substantially in favour of importers.

Revenue losses to Govt. because of this underinvoicing are as follows: (Table 2)



4.3.3 PRODUCTS AND QUALITIES

Nominally, mills produce chipboard of densities between 500 - 700 Kg/m³. Mostly, however, boards of densities around 500 Kg/m³ are produced. Thicknesses vary between 8-36 mm. Boards maybe of three layers or one layer.

Quality control is not established in any Co. yet.

The mechanical and physical properties of bagasse boards are supposed to be lower than those of wood based boards. However, the properties of bagasse boards are still within the limits of international standards. In Pakistan, generally wood based panels are of much lower quality than the panels based on bagasse. Obviously, proper production techniques have much more influence on product quality than the raw materials used.

4.3.4 PRICES

Prices of board vary now between Rs. 150/board to Rs. 170/board. One and a half years back they were sold to retailers for Rs 300/board. Thus chipboard is one of the rare commodities which became cheaper (by 33%). This may be due to heavy competition or saturation of the market.

4.3.5 OUTLOOK

Chipboard consumption in Pakistan is very low as compared to world consumption 0.3 Kg/head in 77/78 as compared to world average of 70 Kg/head. This figure, however, is not very relevant as it is mainly influenced by high consumption in industrialized countries.

In Pakistan, consumption since 1971-72 increased by 84% in absolute terms but per capita consumption increased only by 50% i.e. 0.1 Kg/head. Pakistan has a high chipboard capacity based on GRP/head. However, capacity utilization is below 50%.

The reason for low utilization due to low demand are:-

- o In Pakistan almost entire chipboard is used for furniture, whereas, in industrialized countries 50% is used in construction.
- o Majority of furniture manufactures are small scale enterprises. They traditionally stick to solid wood. Additionally they lack the proper tools for working with chipboard.

In future the demand for chipboard will increase with the increase in population and the construction of larger wood working and furniture manufacturing units.



Based on the various statements of different mill owners, overall capacity utilization in 1983 was 49%.

4.2 IMPORTS

In slump years import of chipboard has been fairly low. In 1977-78, imports jumped up to 434 tons/annum and then stabilized at a level of about 500 tons/annum. Imported chipboard has a special market and hardly matches 2% of local production.

4.3 RAW MATERIALS

4.3.1 BASIC RAW MATERIAL

About 70% of chipboard is now manufactured from bagasse. Raw material cost of bagasse is nearly half of wood. The wood-based units generally use waste wood and wood in round form (Mango in Jeddah and Karachi, Conifer in Chakdara). These mills have to compete with the fire wood market. A maund of any wood for chipboard is hardly available below the firewood prices (Rs. 10-12). Including transport & octroi, it rises (dependent on transport distance) to Rs. 16-20 / per maund at the factory rate i.e. Rs. 400 - 500 / ton wet. With an average moisture content of 50% the raw material cost per ton boundary are about Rs. 1000; losses (bark, etc.) not included.

Additional problem for wood based mills are the unsteady supply, quality of raw material and its heterogeneity, which hamper production and have a negative effect on the quality of boards.

4.3.2 GLUE

It is one of the major cost factors in production of chipboard besides raw material supply.

Glues are mostly of urea formaldehyde type.

Both imported and local glues are used. Generally solid Glues are preferred. Upto June 1982, an import duty of 300% had to be paid on imported glue of which 210% was refunded after use. After June 1982 no refunds were made and cost of imported glue went up to Rs. 15 and Rs. 17 per Kg.

On an average 9-12% of glue is added for chipboard production. To reduce glue costs, manufacturers generally mix local and imported glues for use.



The Chipboard industry in Pakistan started in the year 1965. The basic aim to establish this industry was to relieve the acute shortage of timber and wood in our country. It was felt that any industrial product which could serve as suitable substitute for timber or wood would have access to a large and profitable market and would at the same time be consonant to the Government policy of conservation of national forest wealth. The main type of chipboard are:

- i) Plain Chip board
- ii) Treated Chip board
- iii) Laminated Chipboard

Chipboard being a versatile material has great many applications which are continuously being extended. It has properties similar to those of wood but being uniform in texture, it offers more consistent working qualities. One of its chief qualities is great strength combined with lightness. This is due to the density grading of the chips which ensures that the material has no directional grain and has therefore equal movement and strength in all directions. From this information it follows that a wide range of densities give a wide range of strength hence it is possible to specify boards for a variety of purposes and applications.

Chipboard is successfully being used in construction, varying in application from flooring, partitioning, roofing to providing better thermal insulation for panellings, ceilings, radiation casing, and double skin constructions, etc..

It is also used in shipbuilding industry. For furniture and joinery too, chipboard has proved to be invaluable.

4.0 KILIMAN, WOLF, "SITUATION OF CHIPBOARD INDUSTRY IN PAKISTAN", PAKISTAN JOURNAL OF FORESTRY, APRIL, 1984

Mr. Wolf Killman, is a GIZ expert on Forest Products in the Pakistan German Project for Forest Engineering and Forest Products at the PFE. This article by him on the "Situation of Chipboard Industry in Pakistan" appeared in the Pakistan Journal of Forestry, April 1984. A summary of this article is given below.

4.1 PRESENT STATUS

In 1983, Pakistan had 13 Chipboard plants, one of which was out of operation since 1981. Two other mills were sanctioned at (Harden & Jaranwala) but due to a slump in chipboard market, its owners were reluctant to go through with their construction. The total installed capacity was 387 t/d. Assuming 200 effective working days/year this would run up to 77,400 tons per annum.



TOTAL CAPACITY

SECTOR	INSTALLED	SANCTIONED
1. Public	15,000	
2. Private	63,000	30,000
TOTAL	78,000	30,000

2.2 PRODUCTION

The following table shows the production of Chip/Particle board:

PRODUCTION OF CHIP / PARTICLE BOARD

(TONNES)

YEAR	QUANTITY
1977-78	10,216
1978-79	25,921
1979-80	26,009
1980-81	31,930
1981-82	31,133

Production has increased from 10,216 tonnes in 1977-78 to 31,930 tonnes in 1980-81, then it slightly declined to 31,133 tonnes in 1981-82. Average annual compound growth rate is estimated at 32%. Capacity utilization works out to be 39.9%.

3.0 RASHID, ABDUL MANNAN, "CHIPBOARD AS REPLACEMENT OF WOOD IN INDUSTRY", ECONOMIC REVIEW, MARCH 1983,

This article was published in the ECONOMIC REVIEW of March 1983, written by Mr. Abdul Mannan Rashid. A summary of the article is given below.



2.0 INDUSTRIAL RESEARCH SERVICES (IRS) REPORT - DECEMBER 1982

The IRS prepared another report on the status of chipboard industry in 1982. Extracts from the report are as follows:

2.1 STATUS OF CHIPBOARD INDUSTRY IN 1982

In 1982 there were 8 units engaged in the production of chip/particle board with a combined production capacity of 78,000 tonnes per annum. Production of particle board increased three fold from 19,316 tonnes in 1977-78 to 31,133 tonnes in 1981-82.

One unit namely Dir Forest Complex was managed by the Pakistan Industrial Development Corporation (PIDC) the rest seven units being in the private sector. Besides these, two other units had been sanctioned with a combined production capacity of 30,000 tonnes. Following table shows the units along with their production capacities:

INSTALLED CAPACITY OF PARTICLE/CHIPBOARD

(TONNES)

NAME OF UNIT	ANNUAL INSTALLED CAPACITY
1. Crescent Board limited	20,000
2. Baluchistan Particle Board	19,000
3. Dir Forest Complex	15,000
4. Eawany	5,000
5. Fortico	4,000
6. Pakistan Particle Board	4,000
7. Sindh Board	4,000
8. Pakistan Chip Board	4,000
TOTAL	78,000

SANCTIONED CAPACITY

(TONNES)

NAME OF UNIT	CAPACITY
1. Premier Board	20,000
2. Sargodha Board	10,000
TOTAL	30,000



ANNEXURE - 7

SUMMARY OF AVAILABLE SECONDARY DATA

A number of articles/reports on chipboard and hardboard industries have been printed/published from time to time. However, none of these is very recent. The latest available material is of 1988. Summaries of these different available reports/studies are given below:

1.0 INDUSTRIAL RESEARCH SERVICES (IRS) REPORT - JANUARY 1981

The IRS conducted a survey on particle board industry in 1980. Some of the highlights of this report are given below:

1.1 PROFILE OF PARTICLE BOARD INDUSTRY - 1980

Particle Board manufacturing units	3
Production Capacity (Tons per year)	15,000
Additional Capacity Sanctioned (Tons per year)	65,000
Demand increasing (% per year)	15
Demand to rise by 1984 (Tons)	60,333
Per Capita consumption (Kg)	0.40
Imports of Particle Board (Rs. million in 1979-80)	37.29
Demand supply gap on the basis of world average consumption in 1980 (Tons)	30,000

1.2 STATUS OF PARTICLE BOARD/CHIPBOARD INDUSTRY IN 1980

In 1980 there were three units manufacturing chip board with a total production capacity of 15000 tons per year, whereas, the demand was estimated at 30,000 tons. Because of the shortfall in local supply, demand was met through imports equivalent to Rs. 37.29 million.

Per Capita consumption in 1980 was estimated at 0.40 Kg.

To meet the rising local demand, the Government had sanctioned additional six units having a total capacity of 65,400 tons. This capacity was to be commissioned by 1982-83.

15



ANNEXURE

SUMMARY OF AVAILABLE SECONDARY DATA



TABLE - 2

GOVERNMENT REVENUE

YEARS	VALUE OF IMPORTS AS	ACTUAL REVENUE COLLECTION	ESTIMATED VALUE OF IMPORTS UNDER NORMAL PRICING	REVENUE WHICH SHOULD HAVE BEEN COLLECTED UNDER NORMAL PRICING	ESTIMATED REVENUE LOSS
	(Rs. in Mil.)	(Rs. in Mil.)	(Rs. in Mil.)	(Rs. in Mil.)	(Rs. in Mil.)
1983-84	17.091	28.092	28.405	46.715	19.686
1984-85	16.679	27.692	28.132	46.136	19.451
1985-86	10.731	17.599	17.805	29.331	11.732

Below are given the Table Nos. 3 and 4 depicting the production capacity and import position of hardboard industry.

TABLE - 3

PRODUCTION CAPACITY OF LOCAL INDUSTRY

NAME OF UNIT	LOCATION	YEAR OF ESTABLISHMENT	INSTALLED ANNUAL CAPACITY
i) Pak Hard Board Industry	Karachi	1967	9,000 tons
ii) Crescent Board Mills	Faisalabad	1972	13,000 tons
iii) Fibretex Industry	Kotri	1986	24,000 tons
iv) Asia Board Industry	Hooriabad	1986	9,000 tons
TOTAL			60,000 tons



TABLE - 4

HARDBOARD IMPORTS

YEAR	QUANTITY (Tons)	VALUE (Million Rs.)	UNIT PRICE (Rs.Per Kg)	UNIT PRICE (Rs.Per Kg)
1981-82	847	2.573	3.04	0.944
1982-83	1.493	4.312	2.89	0.898
1983-84	6.641	17.091	2.57	0.798
1984-85	5.643	16.879	2.99	0.929
1985-86	5.045	10.731	2.13	0.661

5.1 DEBT BURDEN ON LOCAL INDUSTRY

The local industry is facing severe debt burden problem. Out of four installed units three units presently have long term loans from financing institutions amounting to Rs. 200 million in both local and foreign currency. The interest alone amounts to Rs. 20 million on these loans, while principal amount is separate. Reduction of duty has created further burdens on local industry.

6.0 "HARDBOARD INDUSTRY", ECONOMIC REVIEW, MAY 1987

There appeared an article on the hardboard industry in the Economic Review of May 1987. Presented below are the main features of the this article.

According to this article, the production of superior-quality hardboard is not sufficient in the country although lower quality hardboard is being extensively manufactured.

This deficiency of good quality hardboard is being met through imports, which are rising at a fast rate. This is evident from the fact that previously total imports for whole year used to be 5000 tonnes, whereas, in the first six months of fiscal year 1986-87, the imports have been more than 6000 tons.

Imports are mainly being made under barter arrangement with USSR, China, Poland, etc..



7.0 EXTRACT FROM "REQUEST FOR SEEKING PROTECTION FROM LOCAL
HARDBOARD INDUSTRY AGAINST DUMPING AND UNDER INVOICING
THROUGH FIXATION OF CORRECT IMPORT TRADE PRICES"

In 1988, a case was prepared by National Management Consultants, on behalf of Pakistan Hardboard Manufacturers' Association. The purpose of this case was to seek protection for local hardboard industry against dumping and underinvoicing through fixation of correct import trade prices.

The findings of the case are summarized below:

- o There were four units of hardboard operating in the Country with a total capacity of 57,000 tons per annum.
- o During the year 1986-87, the local industry was able to produce only 9,923 tons (representing capacity utilization of only 17.40%) of hardboard against imports of 12001 tons.
- o Due to dumping by foreign countries and underinvoicing by their local agents, the imported hardboard was available in the market at prices much lower than their correct prices. Because of this, the local producers were forced to sell their products, not only below the prices of imported hardboard, but even below their own cost of manufacture. On an average the prices of local hardboard were 40% below the price of imported hardboard.
- o This underinvoicing was not only hurting the local industry but was also depriving the government of its needed revenue. According to our estimates, the loss of revenue for the year 1986-87, based on existing level of imports, was around Rs.45.661 million. It was, therefore, requested of the Government to fix correct Import Trade Prices (I.T.Ps) on the basis of currently prevailing prices of hardboard in the international market.

ANNEXURE - 8

TABULATED DATA ON CONSUMPTION OF WOOD IN
CHIPBOARD/PARTICLE BOARD AND HARDBOARD INDUSTRIES

TABULATED DATA
ON
CONSUMPTION OF WOOD IN
CHIPBOARD/PARTICLE BOARD AND
HARDBOARD INDUSTRIES

This report was prepared by National Management Consultants (Pvt) Ltd., Bhutto (PIDC) House, M. T. Khan Road, Karachi for Winrock International, 58, Khayaban-e-Iqbal, F-7/2, Islamabad. Use of any large parts of the report requires prior written permission of Winrock International.

CHIPBOARD AND HARDBOARD MANUFACTURERS COVERED IN THE SURVEY



S. NO.	NAME OF THE COMPANY	LOCATION
	CHIPBOARD MANUFACTURING UNITS USING WOOD	
1.	Anchor Boards Limited	Karachi
2.	Bombay Plywood Industries	Rawalpindi
3.	Dir Forest Industries	Chakdara
4.	Hercules Boards Limited	Karachi
5.	Lahmabad Board Mills Limited	Hattar NWFP
6.	E.D.C. Boards & Plywood (Pvt) Limited	Jehlum
7.	National Particle Board (Pvt) Limited	Karachi
8.	Pakistan Superwood Industries (Pvt) Ltd.	Karachi
9.	Pakistan Chipboard Limited	Jehlum
10.	Pakitex Boards	Karachi
11.	Sadiq Wood Industries (Pvt) Limited	Kala Shah Kaku
	HARDBOARD MANUFACTURING UNITS USING WOOD	
12.	Asia Boards Limited	Nooriabad Distt. Dadu
13.	Fibretext Industries (Pvt) Limited	Kotri
14.	Oosman Brothers Hardboard Industries	Karachi
15.	Pak Hardboard Industries	Karachi
	CHIPBOARD/HARDBOARD UNITS USING BAGASSE	
16.	Baluchistan Particle Board Limited	Hub
17.	Crescent Boards Limited	Faisalabad
18.	Gharib Sons Private Limited	Karachi
19.	Pakistan (Pvt) Limited	Karachi
20.	Sind Particle Board Mills Limited	Kotri

Q.1. Please indicate which stages of wood processing are carried out by your firm?

STAGES OF PROCESSING

Harvesting Trees	=	0
Transporting Logs	=	1
Debarking Logs	=	5
Sawing or slicing Logs	=	7
Fabricating Wood Products	=	12
Finishing Wood Products	=	6
Whole sale Distribution	=	7
Retail Distribution	=	2

Q.2. Please list the four main prices of equipment that you use in this enterprise, their make, size and the number installed?

	<u>EQUIPMENT TYPE</u>	<u>EQUIPMENT SIZE</u>	<u>NO. INSTALLED</u>
1.	Dryer	-	1
	Forming Press	-	1
	Sanding	-	2
2.	Chipper	24"	1
	Dryer	40"	1
	Hammer Mill	36"	1
	Press	28"x4"	1
3.	Hydraulic Press	8"x4"	1
	Chipper		2
	Flaking Machine		2
	Hammer Mill		3
4.	Chipper	5 ton per hour	1
	Flaker	3.5 ton per hour	1
	Dryer	2.5 ton per hour	1
	Glue mixing	2.5 tons per hour	1
5.	Peeking Lathe	8"	1
	Dryer	8"	1
	Chipper	8"	1
	Press	8"	1
6.	Chipper	-	3
	Flaker	-	3
	Dryer	-	3
	Refiner	-	3
7.	Veneer Packing Lathe	-	2
	Chipper	-	2
	Dryer	-	3
	Press	-	3
8.	Blower	-	1
	Bunker	-	1
	Dryer	-	1
	Hammer	-	1
	Press	-	1
9.	Complete bagasse based particle plant	4"x10"	1
10.	Chipper	-	-
	Mixer	-	-
	Press	-	-

11.	Drum Chipper	-	-
	Chip Flaker	-	-
	Chip Refixer	-	-
	Press	-	-
12.	Caul Infeed station	-	1
	Claim Transport	-	1
	Chip dryer	-	1
	Triming 8 size	-	1
	Combination	-	1
13.	Chipper	-	1
	Flaker	-	1
	Dryer	-	1
	Press	-	1
14.	Dryer		1
	Forming	8'x4'	1
	Press		1
	Sanding Machine		1
15.	Chipper	50 tons/day	2
	Defibrator	25 tons/day	2
	Mat Forming Machine	50 tons/day	1
	Hydraulic Press	50 tons/day	1
16.	Complete hardboard plant	-	-
17.	Chipper	Small Chipper 2'-3'	-
	Defibrator	dia meter	-
	Board Forming Machine	Large Chipper 1'-8'	-
	Hydraulic Press	dia meter	1
18.	Chipper	-	4
	Flaker	-	4
	Refiner	-	4
	Dryer	-	4
19.	Bend raw machine	36"	2
	Chipper	D SA 180	1
	Flaker	U 56	1
	Refiner	PZ 12	1
20.	Chipper	7-9 tons/hr.	1
	Defibrator	15-20 tons/day	2
	Formine machine	1330 min	1
	Hot Press	1950 tons.	1

Q.3. What are the four primary products you manufacture and their annual production since 1987 to 1989.

S.NO.	PRODUCT TYPE	PRODUCTION (IN TONS)		
		1987	1988	1989
1.	Chipboard	8,250	7,920	8,260
2.	Chipboard	3,600	3,600	3,600
3.	Chipboard	4,290	4,290	4,290
4.	Chipboard	N.A	2,200	2,200
5.	Chipboard	2,062	2,262	2,062
6.	Chipboard	4,297	4,297	5,156
7.	Chipboard	1,386	1,653	1,793
8.	Chipboard	4,551	5,029	4,644
9.	Chipboard	N.A	3,173	4,222
10.	Chipboard	1,947	1,823	2,520
11.	Chipboard	1,037	1,105	N.A
12.	Chipboard	N.A	N.A	1,925
13.	Chipboard	1,484	1,572	1,259
14.	Chipboard	2,026	2,163	2,098
15.	Chipboard	2,730	2,580	2,500
16.	Hardboard	N.A	N.A	625
17.	Hardboard	5,000	5,215	5,570
18.	Hardboard	3,411	8,338	7,667
19.	Hardboard	4,890	3,130	3,780
20.	Chipboard	9,840	10,551	8,402
21.	Hardboard	N.A	2,547	1,972

Q.4. At what percent of capacity are you operating at present?

1. Approx. 60% to 65%
2. 50%
3. 70%
4. 100%
5. 100%
6. 100%
7. 55%
8. 80%
9. 60% to 70%
10. 75%
11. No production
12. 65%
13. 30 tons/day
14. 100%
15. 25%
16. 75%
17. 34%
18. 60%
19. 25%
20. 60%

6). What has been your actual wood requirement since 1987, in terms of species used, initial form of purchase, source (local or imported) and the quantity required.

WOOD USAGE IN CHIPBOARD/HARDBOARD INDUSTRY

Travis

SR. NO.	WOOD SPECIE	QUANTITY REQUIRED		
		1987	1988	1989
FOR CHIPBOARD				
1.	MANGO	51,669	53,898	49,719
2.	POPLAR	26,493	26,791	25,321
3.	JANGHI TOOT		-	2,164
4.	MIXED WOODS WASTE	8,108	7,899	7,910
SUB-TOTAL		86,270	88,588	88,105
FOR HARDBOARD				
1.	KIKAR (ACACIA NILOTICA)	29,776	34,279	33,895
2.	EUCALYPTUS	14,128	21,493	1,166
SUB-TOTAL		29,776	34,279	35,061
T O T A L		116,046	122,867	123,166

Q7. Please indicate your current and the estimated future consumption of your four most used woods for 1991 and 1992.

**CURRENT AND FUTURE DEMAND FOR WOOD IN
CHIPBOARD/HARDBOARD INDUSTRIES**

SR. NO.	WOOD SPECIE	DEMAND		
		1990	1991	1992
	FOR CHIPBOARD			
1.	MANGO	49,100	57,944	65,469
2.	POPLAR	28,918	30,597	31,779
3.	JANGHI TOOT	2,761	3,358	4,353
4.	MIXED WOODS WASTE	8,657	8,955	9,702
	SUB TOTAL	89,436	100,854	111,303
	FOR HARDBOARD			
1.	KIKAR (ACACIA NILOTICA)	36,123	40,784	41,716
2.	EUCALYPTUS	14,128	21,493	21,493
	SUB TOTAL	50,251	63,209	63,209
	T O T A L	139,887	164,063	174,512

Q.8. From whom do you purchase wood?

Tree grower = 1

Middle man = 13

Forest Auction = 1

Own lands = 0

Any other (please specify) = Contractor, Forest Development Corporation.

Q.9. How is wood delivered to you factory?

Railway = 1

Truck = 15

Animal Cart = 0

Water way = 0

Push Cart = 0

Any other = 0

Q.10. How much do you pay for wood raw material (Per unit) at the factory gate, for the four primary species and grades used?

PRICE OF WOOD RAW MATERIAL

SR. NO.	WOOD SPECIE USED USED	PRICE PER MAUND
1.	Mango	Rs. 30-35
2.	Mango Poplar	Rs. 34 Rs. 28
3.	Mixed Wood Waste	Not in operation
4.	Mixed Wood Used	Rs. 22.5
5.	Mango Poplar	Rs. 45 Rs. 23
6.	Mango Poplar	Rs. 32 Rs. 25
7.	Mango	Rs. 28
8.	Mango	Rs. 25-30
9.	Mango Poplar Jangli Toot	Rs. 33 Rs. 29.25 Rs. 29.25
10.	Mango	Rs. 25-35
11.	Mango Poplar	Rs. 50 Rs. 40
12.	Kikar	Rs. 22-24
13.	Kikar	Rs. 19.00
14.	Kikar	Rs. 32.00
15.	Encalyptus	Rs. 23.00

Q.11. If your primary supplier is any particular individual please give his name and address/

Except one, all other units have stated that they have no particular supplier. The one unit that has responded positively, has stated 'District Forest Offices'.

Q.12. Please describe any wood availability problem you now have or expect to have in the future?

1. Presently no problem, but in future, we are expecting as it is a natural product and a time will come that there will be a shortage for the same.
2. Difficulty is faced in supply during summer season because no body is willing to sell during fruit season. Therefore high inventory has to be purchased during off season, which causes storage problems, block investment and causes fire hazards.
3. Expecting shortage problem in future.
4. Quality of wood is not better.
5. Shortage of decorative wood in future
6. Shortage of logs especially sheesham and imported logs
7. Rate of wood as compared to bagasse is too high.
8. Shortage of wood, uncertainty of supply in future.
9. Demand of wood based chipboard is higher than bagasse based. Prices of wood based is higher than bagasse based. Price is based on quality.

All plants are second hand, once machinery break down, spares are not available. Quality of chipboard is not good because of poor quality of raw material. Machinery can get damaged because of bark in mango wood.

Glue (Urea Formaldehyde) which was not taxed, is now taxed.

Sind should grow poplar. Cheap availability would reduce price. Density varies because of wood used. Poplar does not have bark, dust is eliminated, colour is lighter, brighter. Density can be made uniform.

Duty on chips should be eliminated.

Duty on Glue should be eliminated.

In Kerali market, bagasse board is preferred, in Punjab wood based is preferred.

10. There is no problem now, but there can be problem in future due to lack of planning.

11. No Problem.

12. The wood supply is unorganized and erratic.

Rainy season blocks roads which hampers supply from villages.

Shortage of trucks due to sugar production, and seasonal fruits like watermelons, mangoes etc.. The trucks prefer to deliver these commodities as they can get higher prices.

Shortage of labor. Seasonal vegetables and crops lure away laborers.

During Moharram demand for fire wood increases because of Niz, etc.

Q.13 What other significant raw materials are used in the manufacture of your wood-based product?

**OTHER RAW MATERIALS USED IN
CHIPBOARD/HARDBOARD MANUFACTURE**

SL NO.	RAW MATERIAL USED OTHER THAN WOOD	QUANTITY/YEAR (TONNES)
1.	Glue	660
2.	Glue	360
3.	Glue	1200
4.	Glue	100
5.	Glue	2500
6.	Glue	1200
7.	Glue	1700
8.	Glue	136
9.	Glue	600
10.	Glue	480
11.	N.A	N.A
12.	Paraffin Wax } Sulphuric Acid } Phenolic Resin }	18.75
13.	Water	90,000,000 (gallons)

RB

Q.14 Does your factory produce any wood waste?

WOOD WASTAGE IN CHIPBOARD AND HARDBOARD INDUSTRIES

SR. NO.	CURRENT VOLUME OF WOOD WASTE	FORM OF WOOD WASTE	USES OF WOOD WASTE	SELLING PRICE (IN RS.)
1.	N.A	Wood Dust	N.A	N.A
2.	20 tons	Saw Dust	Full for cooking	Negligible
3.	N.A	Saw Dust	No Use	N.A
4.	206 tons (33% of total wood)	Small Pieces	Fuel	Nothing
5.	N.A	Saw Dust	N.A	N.A
6.	1300 tons	Saw Dust	For Making Bricks	375/tons
7.	N.A	N.A	N.A	N.A
8.	N.A	N.A	N.A	N.A
9.	N.A	N.A	Fire Waste	Free of Cost
10.	N.A	Wood Dust	Poultry Farm Users	Free of Cost
11.	N.A	Sanding Dust	Fuel, Agarbati Manufacture	Free of Cost
12.	148 tons (10% of total wood)	Pith Particles Saw Dust	Fuel	Free of Cost
13.	140 tons (27% of total wood)	N.A	N.A	N.A
14.	N.A	N.A	N.A	N.A
15.	N.A	Saw Dust Wood Pieces	Poultry Farm Use	Negligible

Q.15. Are your average wood cost the same as last year/

1. Same
2. Increase by 30%
3. Increase by 15%
4. Same
5. Increase by 10%
6. Increase by 35%
7. Same
8. Increase by 15%
9. Increase by 30%
10. Same
11. Increase by 5-10%
12. Increase by 45%
13. Increase by 20%
14. Increase by 5%
15. Increase by 5%

Q.16. What is the distribution of your cost of production?

DISTRIBUTION OF COST OF PRODUCTION

SR. NO.	NAME OF COMPANY	WOOD RAW MATERIAL	OTHER RAW MATERIAL	LABOUR COST	OTHER OPERATING COST	TOTAL %age
1	Dir Forest Industries Limited	NA	NA	NA	NA	NA
2	A. D. C. Boards & Plywood (Pvt.) Limited	65%	10%	15%	10%	100
3	Crescent Boards Limited	60%	10%	15%	15%	100
4	Fibretek Industries (Pvt.) Limited	25%	NA	16%	59%	100
5	Sind Particles Boards Mills Limited	17%	30%	13%	40%	100
6	Pakistan HardBoard	36.5%	8.2%	19.3%	36%	100
7	Bombay Plywood Industries	50%	30%	10%	10%	100
8	Asia Boards Industries Limited	20%	5%	15%	60%	100
9	Ocean Brothers Hardboard Industries	20%	5%	15%	60%	100
10	Haloohistan Particles Industries	NA	49%	14%	37%	100
11	Partico (Pvt.) Industries Limited	NA	67%	21%	12%	100
12	Pakistan Chipboard	40%	30%	7%	23%	100
13	Pakistan Superwood Industries	30%	30%	20%	20%	100
14	Islamabad Board Mills Limited	45%	35%	5%	15%	100
15	Sadiq Wood Industries	70%	8%	10%	12%	100
16	Pakitek Boards Industries	22%	24%	12%	42%	100
17	Anchor Boards (Pvt.) Limited	30%	30%	10%	30%	100
18	Gerbsons (Pvt.) Limited	NA	NA	NA	NA	NA
19	Natural Particle Boards (Pvt.) Limited	30%	10%	7.6%	32.4%	100
20	Hercules Boards Limited	22%	60%	10%	8%	100

Q.17. have you made any major technological changes that have affected your basic raw material used?

1. No
2. We can produce our product from bagasse also, in case of no supply of wood.
3. No
4. No
5. No
6. No
7. No
8. No
9. Not applicable
10. No
11. In locally manufactured machine variety should be latest.
12. All plants are second hand, once machinery break down, spares are not available.
13. No.
14. Not applicable
15. No
16. Plant is designed for using bagasse as raw material.

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Q.18 What is your gross annual value of sales?

COMPANY	AVERAGE VALUE OF SALES (in million)
Crescent Board	102.3 million
Asia Board	19.00 million
Libretex	35.0 million
Pak Hardbard	20.0 million
Oosman Borthers	4.0 million
Partico	13.0 million
Pakistan Superwood	12.5 million
National Particle	8.0 million
Islamabad Board	18.5 million
Dir Forest	36.4 million in 1987-88
Hercules	17.0 million
Garib Sons	21.0 million
Sind Particle	26.2 million
Bombay Plywood	35.0 million
KDC Board	50.0 million
Sadiq Wood Industries	3.0 million
Pakistan Chipboard	35.0 million
Anchor Board	10.0 million
Fakitex	15.0 million
Baluchistan	70.26 million

Q.19 What is the category-wise break-up of your total manpower?

COMPANY WISE BREAK-UP OF MANPOWER

SR. NO.	MANAGERIAL	CLERICAL	P.W	C.W	TOTAL
1	38	133	384	4	559
2	15	25	500	-	540
3	40	45	260	-	345
4	15	5	200	-	220
5	1	38	76	105	220
6	6	8	165	-	179
7	5	12	90	65	172
8	3	10	25	125	163
9	1	10	90	20	121
10	9	7	104	-	120
11	3	7	80	15	105
12	6	10	80	-	96
13	5	6	70	8	89
14	3	5	43	26	77
15	3	3	45	15	66
16	1	3	40	20	64
17	1	2	30	30	63
18	2	5	30	7	44
19	-	3	29	10	42
20	5	2	20	10	37

Q.20. Would you like to make any other comment/suggestion regarding wood-usage in your industry?

1. No
2. Middleman causes artificial inventory problem by blocking inventory during peak period and slowing down supply. Mango wood is scarce during peak mango season. Plantation should be given in the hands of the private sector i.e the industrialists.
3. Wood requirement in the Country is increasing. Please ask the forest department to take special attention of forests.
4. Shortage of gas/electricity, water, as well as imported raw material should be removed. Import duty on imported raw material should be removed to preserve local forests.
5. procurement of wood should be easy. Rate of wood should be cheap. Quality Technical know-how in the market is not available. Freight should be cheap.
6. Other raw material that can be used in production - cotton sticks/straw and rice straw.
7. Government should do planning of minimum 5 years. Take deposit from us and make supply regularized. Punjab and Sind has maximum wood. Meet requirement of 4" to 8" diameter, tree grows in 5-6 years to desired size.