

## Production in a Factory – A Paper Mill

Handicraft production is done at home by small families with the help of some simple tools. In contrast factories produce goods on a large scale, with the help of machines and a large number of workers. Let us find out how production is organised in large factories.

- ◆ Have you ever visited any factory? Describe it.
- ◆ Draw a picture of the factory you visited and using your imagination describe in 300 words on what could happen inside a factory.

We use so much of paper. Do you know how the paper of books, records, registers, progress reports and news papers is made? There are four paper mills in Andhra Pradesh - Sirpur Kagaznagar (Adilabad

district), Rajamundry (East Godavari district), Kurnool, and Bhadrachalam (Khammam district).

- ◆ Mark the four districts with paper mills in a map of Andhra Pradesh. Why do you think they are located there?

### Raw Materials

Materials required to produce a commodity are called raw materials.



*Fig 11.1  
Factory from outside*



*Fig 11.2 Lorries waiting with bamboo loads*

Factories require large and continuous supply of raw materials. You will find dozens of lorries supplying raw materials to them every day. Paper mills generally use wood from bamboo, eucalyptus and subabul trees. Subabul wood is most widely used now. Besides wood a large number of chemicals such as common salt, caustic soda and so on are also used in different stages of paper making. Scrap paper is also recycled in paper mills.

Factories use heavy machinery which are run by electricity. Paper mill needs electricity for operating its machines. The paper mill shown in the picture for example, requires nearly 25 Mega Watt every year. More than half of the electricity requirement is met through the factory's own power generators. Besides electricity, the mill requires a large quantity of clean water throughout the year.

### **Paper mills and Disappearance of Bamboo**

Although raw materials for paper are available in the forests, it is not very easily procured. Paper mills are generally

established near forests where bamboo and other soft wood trees are available.

Paper mills engage contractors to supply bamboo and other raw materials. A few decades ago, contractors employed tribal people (like those living in Kunawaram hills you read about in Class VI) to cut bamboo from forests. Due to excessive cutting in the past, there are no bamboos available in forests near the paper mills now.

Hence, paper mills are looking for alternative raw materials like subabul which are grown in villages. This led the government to encourage people to grow subabul trees on farmland. Now-a-days, paper mills bring wood from distant places.

- ◆ What are the most important raw materials for the paper industry?
- ◆ Would you consider electricity as a raw material? Give your reasons.
- ◆ Discuss about a few mills or factories you know with your teacher and fill in the table.



*Fig 11.3 Bamboo lifter*

S.No.	Product	Name of industry	Raw Material
1	Shoe/Chappel	Footwear industry	Leather / rubber / canvas
2			
3			
4			

- ◆ Do you feel that if we use more paper, we will also have to cut more forests or reduce the area under food crops? Discuss in the class.

When we visited the paper mill, we found 4-5 lorries with loads of subabul wood waiting outside the mill gate. Only after 9.30 am, they would be allowed to enter the mill. There were separate gates – one for the workers and the other large gate for the vehicles. We had prior permission from the paper mill authorities to visit the paper mill. We entered our names in the register at the security room near the gate and went into the mill. Later lorries also entered the mill.

### Process of Paper Making

Inside the factory compound we saw a lifter crane lifting subabul wood from a lorry and placing it on an iron platform. A conveyor belt took the wood to the cutting machine. Paper is actually made in five stages. This paper mill had separate

sections for each stage which uses different machines and raw materials. The stages are as follows:

(i) *Chipping*: In this stage, large wood pieces are cut into small chips with the help of large machines. There are about 15 to 20 workers in this section. The chips are separated according to the size. The big chips are again cut into small chips. One load of a lorry wood is cut by the machines into chips in about 30 minutes. Work goes in this way throughout the day. Can you imagine how many trees have to be cut to run a paper mill for just one day i.e. 24 hours?

(ii) *Making of wood pulp*: The small wood chips are sent to fibre line section. In this section, the wood chips are boiled with some chemicals in large vessels.



Fig 11.4 Labourer at chipping machine



Fig 11.5 Labourers at setting machine



Fig 11.6 Pulping machine (Fiber line)

Through this process the wood chips are turned into thin fibres (like cotton fibres). The liquid pulp is then whitened using chemicals. Then it becomes creamy. We found the liquid pulp in milky white colour without any dust.

(iii) *Spreading the pulp:* The liquid pulp is spread on thin screens over a cylinder. This is an important stage in the paper manufacturing as the width, length and thickness of the paper is set. The water drains out and also evaporates due to heat and the pulp dries up. Once this is done, the pulp is forwarded through the conveyer belt.

(iv) *Pressing, drying and rolling:* The drying pulp is pressed by rollers to smoothen it. When the pulp dries up completely we get a sheet of paper which is now rolled up.

(v) *Cutting:* The paper is cut in the cutting machines according to the size required. Paper is made into rolls and sheets as well. It is then packed and sent to godowns.

Production takes place continuously in all sections at the same time.

## Work in Batches

The paper in the form of rolls and sheets is preserved in godowns. Each roll is labeled with Batch / Lot no., weight etc. What is a batch? When a lorry load of wood is brought into the factory, the entire wood is given a batch number. This batch is then sent to different sections one after the other. Raw material of one batch would be processed

together at each stage. For example, when batch No. 201 is being cut into small pieces, at the same time the previous batch (No. 200) would be in the section for making pulp and batch No. 199 would be in the spreading section and so on. As soon as No. 201 is cut into pieces it would be sent to the next section and No. 202 would come up for cutting into pieces.

All papers produced in one batch would have had the same inputs and processing and so the quality will be the same. The batch system allows a factory to produce continuously throughout the day. It also allows the managers to trace any mistake in the product by checking what went wrong with the particular batch.

## Working Hours and Shifts

This paper mill runs all 24 hours in a day. The workers work in three shifts of eight hours each. They are 'A', 'B' and 'C' shifts. In each shift about 800-900 workers are at work.

A Shift: 6 AM to 2 PM

B Shift: 2 PM to 10 PM

C Shift: 10 PM to 6 AM (Night Shift)

Night shift workers get a special allowance. Workers change their shift

cyclically. Workers of each shift have to move from A shift to B and then to C every week. There is also a general shift for the administrative staff which is from 9.30 am to 5 pm. Administrative staff look after the management, accounts, trade and sales of the product, workers' welfare activities etc.

## Selling the Paper

This paper mill has marketing depots in different cities. It also sells papers in other countries such as Sri Lanka, Bangladesh, Nepal, Malaysia, Singapore, Nigeria and South Africa. The paper is sold through these depots.

Developed railway and roadway are there. Therefore it is easy to transport wood and paper to and from the mill.

- ◆ Why is it necessary to put the Label / Batch no. on the paper rolls?
- ◆ Why do you think the paper mill works through the day and night? Compare this with how agricultural field work takes place.

- ◆ Why is there a security guard at the gate? Enact how the watchman behaves. Who does he allow in and who does he not allow?

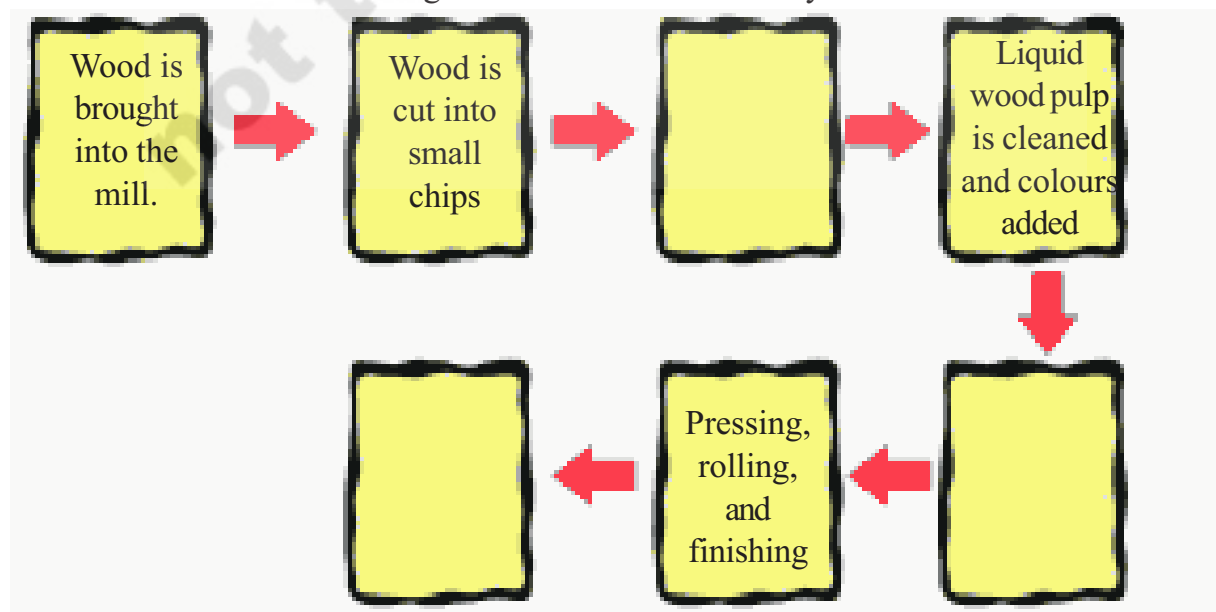
## Working in Paper Mill

A factory employs a large number of workers of different kinds - some work on machines, some help them, some take care of electrical fittings, some help in transporting the materials, etc. Some of them are highly qualified like engineers while others may have education from ITI and polytechnique colleges. Still others may be illiterate doing manual work like cleaning. A factory also employs people on different terms and conditions.

Some are regular 'permanent' workers of the factory, while some others may be employed as casual workers when the need arises; still others are employed as contract workers. Let us look at this in greater detail.

Anand is a permanent worker in the paper mill. You can see him in his uniform - blue shirt and khaki pant in the pressing section.

- ◆ Read the below section again and fill in the blanks in your own sentences :



He has been working in this mill for more than 10 years and he is getting Rs. 15,000 per month. As a regular employee, he gets a number of benefits like Provident Fund (paid when he retires from service), medical insurance, etc. Also, if for any reason his employment is terminated or he has to cease work due to any accident etc, he will be paid compensation by the factory. He will also get a salary rise every year. If he or his family member becomes sick, he takes them to nearby government run (Employees State Insurance -ESI) dispensary and gets medicines free of cost. He pays a small amount and the paper mill pays some amount for availing this facility. Anand gets regular holidays – one day every week, festivals, and some additional leaves. He is also given allowances for buying uniform cloth and washing allowances. In some years, Anand also gets bonus, an additional amount paid to workers when the paper mill gets benefits. There are about 1800 such permanent workers in the mill.

Umar is not a permanent worker but he comes daily and works in the factory. He

is a contract labourer. He is usually asked to help in unloading the trucks or in packing and loading the paper. One year ago he was contacted in his village in Maharashtra by a labour contractor who promised him a job in this mill. Workers like Umar are paid a lower salary than that of permanent workers (about Rs.8000 a month) and do not get the allowances or medical help or bonus. They don't get any paid holiday. However, they get work throughout the year and may get regularised as permanent workers after two or three years of working.

The women who work in this factory usually clean the floors and paste labels on the paper packets. Pushpa is working as a casual worker in this factory. Workers who are employed off and on are called 'Casual Workers.' Pushpa comes every morning to the factory to see if there is work. Usually they employ her for four or five days in a week to clean the floors of the factory. In the section where wood is chipped, there is a lot of wood dust and chips all over the

floor. All this has to be cleaned and the machines are to be dusted properly. She is paid on a daily basis and many days she does not get any work. She is paid about Rs.100-150 a day. Though she has been working for more than three years, she earns only Rs. 2500 a month. She is also not entitled to any of the facilities that are available to permanent workers like Anand.



*Fig 11.7 Paper cutting machine*

Usually factory owners try to reduce their costs by employing casual workers even for regular work. Sometimes they bring new machines which require fewer workers. In such situations the workers and their unions resort to agitations and bargaining with the managers to improve their lot.

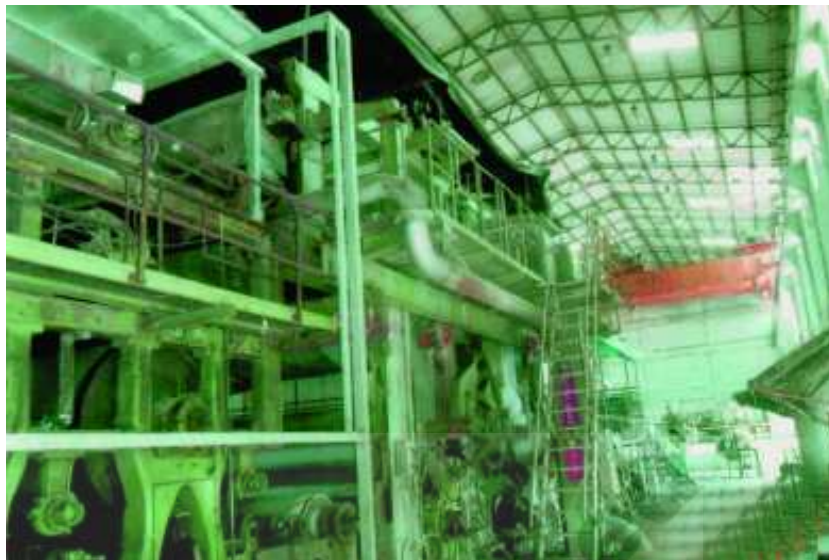


Fig 11.8 Inside the factory

Besides the workers the mill employs a number of accountants, clerks and managers who are paid better salaries. The senior managers who are usually from the families of the owners of the mill get paid very high salaries along with a number of allowances, free housing, education for children etc.

- ◆ Fill the table comparing Anand, Umar and Pushpa:

### Who Owns the Paper Mill?

This mill does not have any one owner. Some people got together to form a company which owns this mill. These people invested large amounts of money and also borrowed money from the banks

S.No.	Name	Work	Experience	Income	Other Benefits
1	Anand				
2	Umar				
3	Pushpa				

- ◆ Why do you think a factory needs to employ people on different terms - regular, temporary and casual labourers?
- ◆ What do you think are the problems of the workers who are not permanent?
- ◆ Why do you think people from faraway places come to work in the paper mill in Andhra Pradesh?

to set up this factory. They appoint the managers, other administrative staff and regular employees. The workers, managers and administrative staff are paid salaries but not the owners. The owners share amongst themselves whatever is left after paying wages and other costs of running this paper mill. That is, they get all the profits from the factory. They also bear the loss, if any.

Can you summarise the main features of factory production using the following points?

1. Machines:
2. Raw Materials:
3. Energy and Water:
4. Production:
5. Workers:
6. Managers:
7. Market:
8. Owners:

Some factories are owned not by individual owners or group of owners but by the government. These are run by the government for the welfare of all people.

Most factories need raw materials in such large quantities that natural resources like forests, rivers and mines are rapidly exhausted. They also give out smoke, pollute the rivers and surrounding land with their chemical effluents. Thus there is a need to develop methods to control the damage they cause to the environment.

Factories provide employment to a large number of people. However, the workers who work in these factories often find the work very tedious and many of them become sick due to exposure to dust and chemicals etc. They also get paid very little. They are also often forced to live in slums with poor facilities.

One of the major challenges before us is to find out how to balance our need for various kinds of goods and the ill effects of the factory system and how to make the life of workers comfortable and dignified.

## Pollution

When we were going to the other side of the paper mill, we felt some unpleasant smell in the area. This was due to the use of chemicals. After coming out of the paper mill, we were talking to a few residents living on the outskirts of the paper mill. They said this stench was usual and it was common to find dust released from the industry set down on the leaves of plants on the farm, trees in the nearby area and on garden plants. The mill also draws a lot of fresh water from the river but lets out waste water containing poisonous chemicals which eventually joins the river.

Only last year the paper mill got an effluent treatment plant to which all the waste water with chemicals is sent. This machine, removes contaminants (substances causing harm to living organisms through air, water, soil and food) and produce environmentally safe water (treated effluent) and solid waste suitable for disposal or reuse (which is normally used as fertilizer). Besides this, the paper mills use treated effluent to water their gardens. Some farmers also use this for irrigation.

There are large number of factories in our state and country which produce diverse articles of use. They produce them in large quantities in a short time.



Fig 11.9 Rolls of papers



**Key words :**

1. Platform
2. Conveyor belt
3. Fibre line
4. Label

5. Allowance
6. Bonus
7. Pollution
8. Working hours
9. Raw material

**Improve your learning**

1. Imagine that you wish to start a leather or textile factory. What are the aspects you will have to consider for setting up a mill?
2. Explain the process of paper making in your own words.
3. Do you think this paper mill will stop working one day? If it does, what will be the impact on the labourers' lives?
4. Fill in the following table

Shift	Timings
A	
B	
C	

5. Imagine a world without paper. What alternatives will you use instead of paper?
6. What do you think are some of the things that can be done to stop pollution caused by industries?
7. Organise a debate in the classroom on the pros and cons of the paper mill.
8. List the benefits and income received by a regular employee of the paper mill. Contrast them with that of a temporary employee and a casual worker.
9. Compare the production of baskets by craftspersons and production of paper with reference to the following points: (i) Workplace (ii) Tools/machines (iii) raw materials (iv) Workers (v) Market (vi) Owners.
10. There is a paper mill at Sirpur Kagaznagar in Adilabad district. Why do you think it is not established in the district head quarters? Discuss.

**Project work :**

You might have noticed some factories in your area causing pollution. Or imagine that in your locality one factory is causing pollution. Write a letter to the editor of a local newspaper and discuss the contents in the classroom.