

COCONUT STEM UTILIZATION IN INDONESIA

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INTRODUCTION

Coconut stem has been utilized in every coconut producing country in some form or other. Its utilization varies widely from small bridges to houses, furnitures and works of art. In Indonesia it is used mainly in Java, the most densely populated island. In other islands it is rarely used except for foot bridges because of two reasons. First, the farmers are reluctant to fell their coconut trees for its yield, however, small it is. Second, there is still enough supply of forest wood.

TRADITIONAL UTILIZATION

In Java, despite its long history of utilization the preparation is still quite simple. For foot bridges, the stem is cut to the desired length and is used as round wood without any treatment. Because the bark is still intact and is exposed to rain and sun, the stem is easily affected by fungus and rot. *Oryctes* beetle is also quite often to be found to breed in this stem. Under this condition the stem usually does not stand longer than one year.

In buildings constructed for tourism purposes (hotels, restaurants, etc.) coconut stem is used for its beautiful bark, which gives a tropical atmosphere. Here the stem is used as round wood or split without removing the bark. To give an exotic look, the bark is sometimes varnished. Under this condition it is not exposed to the weather, but yet does not last more than five to six years.

In the rural areas of Java, coconut stem is traditionally used to support the roof. Chosen old coconut stem is debarked and split into 4 parts either by axe or sawblade and dried under the sun. When it is dry it is used directly without any further treatment. Under the roof, protected from rain and kept dry by the roof heat, the wood can last longer than hundred years. In spite of the durability cocowood is rarely used for other parts of the house like doors, windows, walls, floor, etc. One reason is it is relatively difficult to saw and the other is its likelihood of getting contact with water which make it liable to decay quickly.

COMMERCIALIZATION OF THE WOOD

Two places where cocowood has been taken to commercial use are Brebes and Tegal, two districts in the north coast of Central Java.

However, the coco stems do not come from these districts. They come from Ciamis and Tasikmalaya, two districts at the south coast of West Java, about one hundred kilometers away. The reason behind is that, the wood from Brebes and Tegal is soft and is pale coloured. It is believed that this low quality wood is due to the type of soil and the high water table, in the area. The same quality is also found in Seruwai Estate in North Sumatera which grows its coconut in tidal area. Research should be undertaken to find whether this character is inherited or acquired and if it is environmental, what really caused it.

The price of round stem delivered at Brebes or Tegal is Rp 700 per meter. The stems are usually 4 to 5 m long. After debarking and sawnsplit into 4, they sell for Rp.800 per meter. Various

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sizes can also be made upon request. The price depends on the size and the smoothness of the surface. The bark and low quality wood is sold as fire wood for Rp. 2,000 per meter³.

Log breakdown is done with the use of a two-man ripsaw. A team of 3 men can split 201m of round stem per day. Another man uses a plane to make the sawn surface smooth. Each man is paid Rp 750/day plus two meals and medical support.

The price of cocowood is far below that of forest wood of the same class (class 2 or 3). The following are prices of some locally available woods.

W o o d	C l a s s	Rp/m ³
teak	I	776,000
Merbau/Damar	I-II	272,000
Cocowood	II-III	103,400
Camphor	II-III	205,000
White shorea	III-IV	187,000
Red shorea	III-IV	182,500

The consumers of the product are mainly local people. Very little is sold to other provinces. Despite the fact that local people are using this wood in the construction of large buildings, even under Government projects it is seldom used. One reason is that the construction of large buildings including Government buildings are under Government inspection and the building construction regulations demand, the use of only those timber which are already approved in the Government's wood standards. Cocowood is not included in it.

COCOWOOD SUPPLY POTENTIAL

Statistics show that at present there are more than 300 million coconut trees in Indonesia. More than 30% of the coconut stand is above 50 years old. This condition calls for immediate replanting of 100 Million trees. Assuming that one tree could produce 0.3 m³ the potential cocowood supply would be 30 million m³.

COCOWOOD HOUSE

Looking at the huge potential of cocowood supply in Indonesia and the success in cocowood utilization in the Philippines, New Zealand, Australia and in the Pacific, PPK (Coconut Research Centre) directed its efforts to stimulate interest in the use of cocowood in housing. It is envisaged that the increase in cocowood consumption will hopefully bring positive impact e.g.:

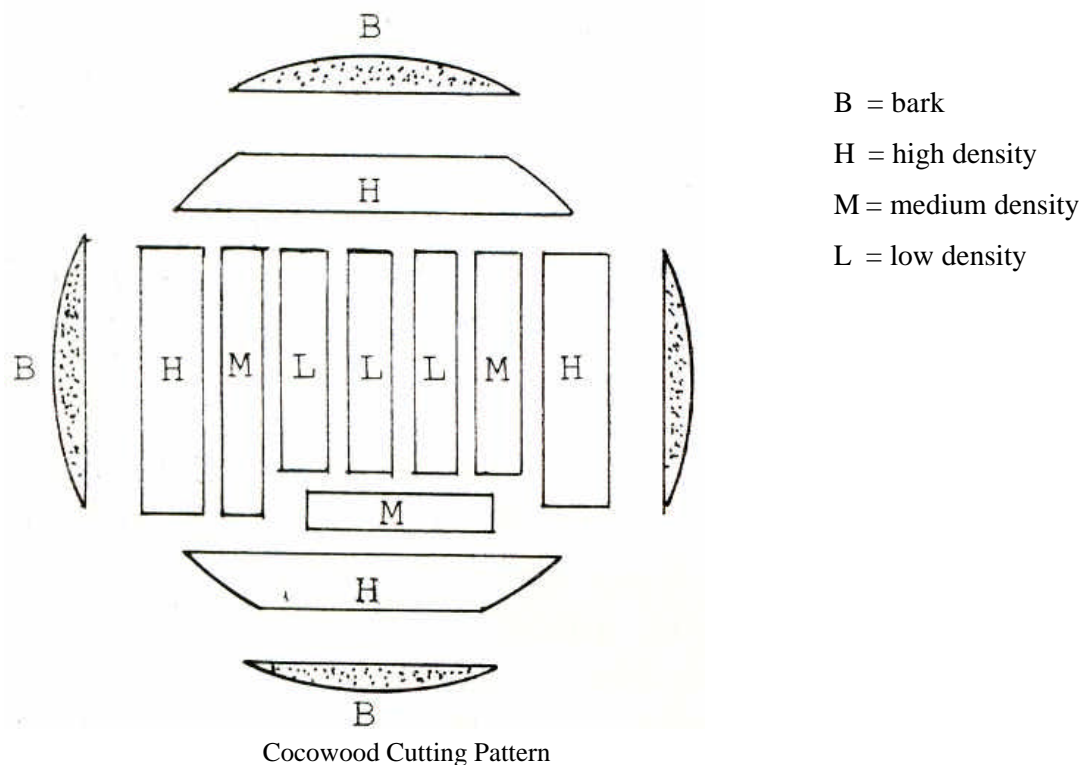
1. Increase in cocowood price which will stimulate the small farmers to fell their old stands and in turn it will accelerate the replanting programme;
2. Stimulate the industry to develop the wood processing facilities;
3. Reduce the use of forest wood which in turn will preserve the ecosystem;
4. The coconut stem would not rot and provide a breeding ground for insect pest which would attack the new plants.

In order to demonstrate the potential of coconut stem PPK constructed a house with all the wood components made of cocowood (floor, wall, doors, windows, ceiling, and roof support). Non wood parts were the foundation, walls of the pantry and the shower room. The house is divided into 3 separate units namely 2 bedrooms and one dining and living room. Every bedroom has a terrace and a shower room and the dining room has a pantry and a toilet. The size of each unit is 6 x 6 m, The ceiling is 2.30 m high. The house is raised on 60 cm high foundation to avoid contact with ground water and to prevent attack from termite.

The pieces of furniture are also made of cocowood; sofas, dining room table, chairs, beds, desk and cupboards.

The wood was chosen from old coconut stand more than 50 years of age. Only the first 10 to 15 m log is used. The upper part of the stem was discarded for its softness. The bole was left because of its shape which is difficult to be cut in line with the rest of the stem. The bark was also discarded.

To obtain the high and medium density wood, only the outer part was taken using the sawing pattern shown below. The soft inner part of the stem was again discarded.



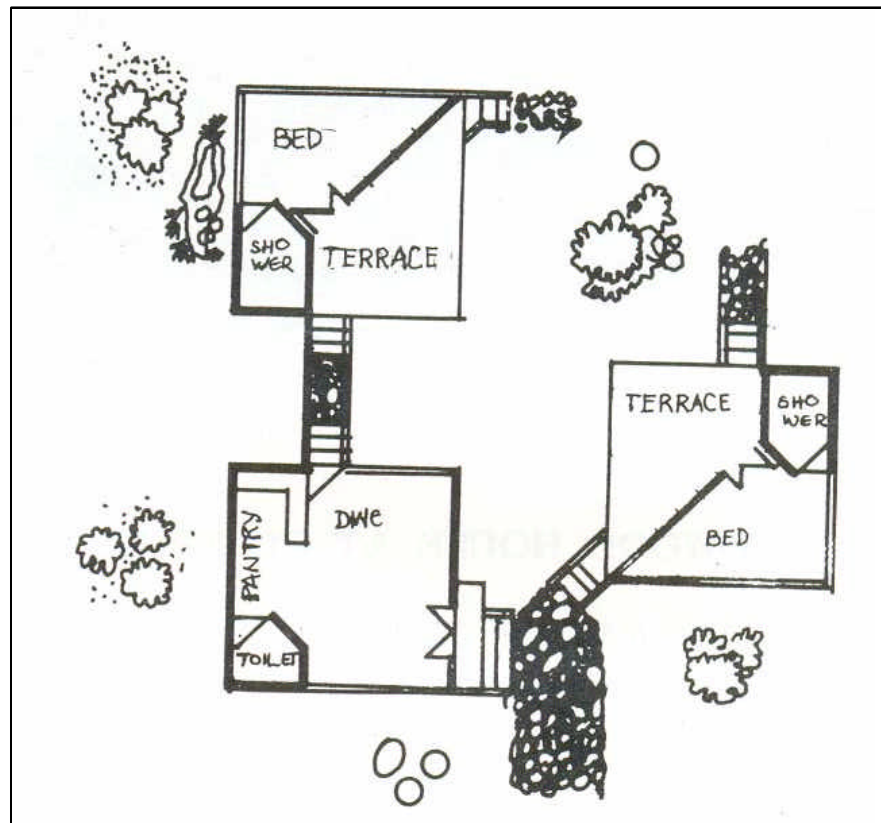
The felling, cutting and splitting of the stem was done with chainsaw. The wood was sundried for 3-4 weeks. To protect it from insect pest and fungus the wood which was to be used at the base and those which would be exposed to the weather were treated with CCA (copper chrome arsenate) by dipping for 24 hours. The wood was made smooth manually using plane and sand paper.

To minimize the cost, the roof is of corrugated sheet but was covered with thatched roof of coconut leaves so that it fit into the cocowood structure.

Due to the use of chainsaw the rest of the process was done manually, the wood recovery was as low as 20%. Only 0.2 m^{3PT} of sawn wood was obtained from one tree . The dining room needed 10 m₃ of sawn-wood was obtained from one tree. The dining room needed 10 m₃ of sawn wood (50 trees) and one bed room needed 15 m₃ of sawn wood (75 trees).

REMARKS

Visitors to the cocowood house at PPK would certainly be impressed by the strong look of the house. The items of furniture convince that cocowood could be as good as the best forest wood. On the economic side it really beats any wood available in the market.





COCOWOOD HOUSE AT COCONUT RESEARCH CENTRE