

## Mini Rice Mill

India is the second largest producer of rice in the world. The mechanised sector of rice milling industry handles more than 45 million tonnes of paddy annually. About 10-15 million tonnes are processed through large scale modern mills involved in producing fine quality of rice for export market.

The major portion of paddy is still processed through hullers which are usually low capacity mills and result in very high percentage of broken. In these hullers both shelling and polishing operations are carried out simultaneously and there is no control on the polishing of rice. As a result impure bran mixed with husk is obtained and a higher breakage of rice of rice results in loss of revenue. To overcome these problems it is necessary to carry out the shelling and polishing in two separate units.



**Huller**

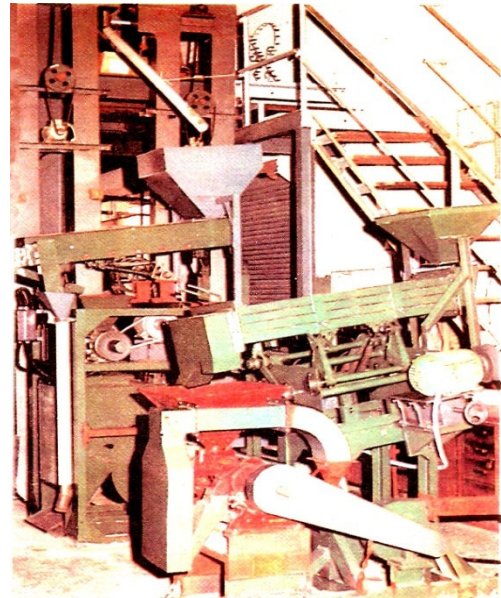
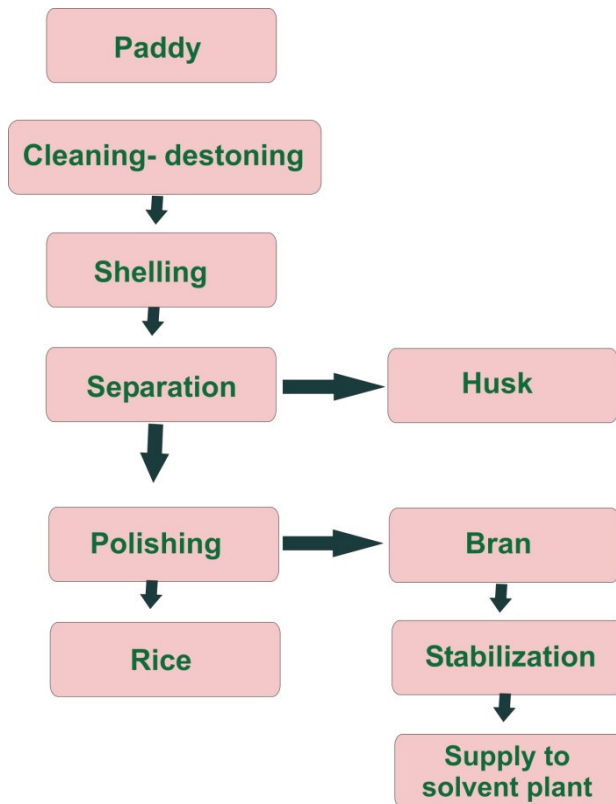
A mini rice mill has been developed by CFTRI, Mysore and many manufacturers have sprung up having their own versions. The sheller is a compact unit designed on the densimetric classification principle; the polisher could be light either vertical cone polisher or a horizontal roller polisher.

### Salient features of mini rice mill

- 1-4 percent extra yield of head rice depending on the variety
- Production of pure rice bran free from husk
- Control over degree of polishing from 3 percent onwards
- Capacity as low as 500 kg of paddy/hour and can also serve as custom milling unit

The pure bran can be supplied to solvent extraction industry after stabilisation for production of edible rice bran oil. Chemical stabilisation process is easy to operate compared to steam or roasting treatment. The principal of the process lies in maintaining pH of the bran to the level where the lipase activity would be negligible and within safe limit for Free Fatty Acids (FFA) which is 2-4 percent for edible over bran which inactivates enzymes to nearly zero level.

## Process Flow Chart



**Modern Rice Mill developed by CFTRI**

About 40 litres of commercially available concentrated hydrochloric acid is required for one tonne of bran. Mixers of drum type are used for spraying HCL over bran.

Present paddy production of country is 91-92 million Tonne and substantial quality is processed at cottage scale level.

### Technical aspects

#### Location

There is a vast potential for installing mini rice mills in all paddy growing areas, as a rural small scale activity.

#### Process of Manufacture

The mini rice mill consists of a paddy-cleaner, sheller, separator and a polisher. The separator is a compact unit designed on the densimetric classification principle. The polisher could be either a vertical cone polisher or a horizontal rotor polisher. Even a huller used for milling could serve as a polisher though there may be more breakage of rice.

The most important feature of the mill is that the shelling and polishing are kept separate. Because of the low capacity, a centrifugal sheller is most commonly employed. Different units could be used as polisher. For maximum advantage, it is necessary to use a paddy separator, whereby need of a high polish can be avoided.

**Quality Control and Standards:** As per AGMARK specification

### **Suppliers of machinery**

- Mysore precision Engineers, C-123-124, Industrial Estate, Yadavgi, Mysore
- Kisan Krishi Yantra Udyog, Kanpur, U.P.
- Vishwakarma Iron Foundry, Kashmiriya, Tanda, Dist. Ambedkar Nagar, U.P.
- Super Engineering Works, Howra-Amta Road, Dass Nagar, Howrah

### **Economics**

- Land 500 Sqcm
- Work shed 100 Sqm.
- Machinery

Tribals/villagers go to long distances to get their paddy processed for domestic consumption. They also resort manual processing where quality of rice produced is very poor. Entrepreneurs can set up mini rice mills as a service unit for custom milling. Mini rice mills are also viable in small paddy growing pockets of the country.

The Basmati rice could also be processed in mini rice mills which an attractive proposal. Mini rice mill consists of:

- Cleaner
- Sheller
- Seperator
- Polisher

In case of production parboiled rice the paddy is soaked in water for 10-12 hours and then steam dried before transfer to sheller.

The machines are commercially available from manufacturers. Those interested in manufacturing of mini rice mills can contact CFTRI Mysore for design/ Technology. To promote the improved rice milling, government is offering subsidies.

### **By products**

- Rice Bran for supply to solvent extraction plants after stabilisation
- Paddy husk- use in particle board industry, rice husk cement

Down line products like rice flakes 'poha' units could also be set up which offer good return.

## Techno-economics

<b>Production capacity</b>	<b>500 kg of paddy/ hour or 4T/day</b>
<b>Land 500 sq m.</b>	<b>₹ 50000</b>
<b>workshed + godown</b>	<b>₹ 200000</b>
<b>Machinery</b>	<b>₹ 200000</b>
<b>Pre-operations/ Miscellaneous</b>	<b>₹ 50000</b>
<b>Total</b>	<b>₹ 500000</b>



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**Note:** The author may have used various references in the preparation of this article. For further details please contact him/her.

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