

BERITA KHUSUS ANDA :

RICE HUSK IN INDONESIA

By :

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ABSTRACT

The paddy production in Indonesia should contain rice husk 20 - 25 %, bran 10 - 12 %, and rice 63 - 70 %.

Rice husk usually burned to ash used as abrasive purposes for household application, and also rice husk used for burning bricks. In this case we are facing the secondary waste product which is rich in SiO_2 content, the ash from burning the rice husk as fuel.

The characteristics for rice husk and ash (dry basis) from Tangerang & Karawang especially ash, SiO_2 , CaO , MgO , and Fe_2O_3 are determinated.

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- Indonesia is a paddy cultivating country with the total harvested areas wet and dry-land paddy ca 8,000,000 HA and the average rice production is about 1,6 metric tons per HA or equivalent ca 26,300,000 metric tons of paddy production yearly. This figures correspond to ca 6,500,000 metric tons of rice husk per year production, a fantastic figure of agricultural waste material, but unfortunately this enormous rice husk are produced as a by product of thousands of rice mills spreaded within the country.
- Rice production is carried on through the utilization of various size of rice mills ; in one region Karawang West Java there are :
 - 87 big rice mills

249 medium size rice mills

164 huller

87 other small rice mills

with the total yearly production of ca 700,000 metric tons paddy equivalent to ca 140,000 metric tons of rice husk annually.

The total yearly production of paddy in Indonesia is available in Table I, this figure correspond to the annual rice husk production based on 25 % calculation from paddy. In some cases the percentage of rice husk as a by product reach up to 27 % from paddy (Karawang).

Table I. Total paddy production in Indonesia and equivalent rice husk (1969 - 1976). *)

| Year | Production (metric tons) | Rice husk **) (metric tons) |
|------|-----------------------------|--------------------------------|
| 1969 | 23,555,847 | 5,888,961 |
| 1970 | 25,269,238 | 6,317,309 |
| 1971 | 26,392,175 | 6,598,043 |
| 1972 | 25,351,110 | 6,337,777 |
| 1973 | 28,090,849 | 7,022,712 |
| 1974 | 29,376,492 | 7,344,123 |
| 1975 | 29,201,619 | 7,300,404 |
| 1976 | 23,300,939 | 5,825,234 |

*) rice husk 20 - 25 % **) based on 25 % from paddy.
bran 10 - 12 %
rice 63 - 70 %

- The utilization of rice husk and rice husk products, a by product from the rice mills, as a new building material take a new dimension, for housing purposes especially in the developing countries, regarding the availa-

bility of rice husk in rice cultivating countries like Indonesia.

Today rice husk usually appear a bulky waste and burned to ash used as abrasive purposes for household application. Some region are trying to use rice husk for burning bricks as substitute of timber/bunker oil with a good quality bricks products. In this case we are facing the secondary waste product, the ash from burning the rice husk as fuel.

A preliminary study on rice husk and ash analysis for Tangerang & Karawang located at West Java resulted as follows :

Table II. Characteristic for rice husk and ash *)
dry basis (%)

| | Ash | SiO ₂ | CaO | MgO | Fe ₂ O ₃ |
|-----------------------|--------|------------------|-------|-------|--------------------------------|
| Rice husk (Karawang) | 25,486 | 22,785 | 0,203 | 0,064 | 0,131 |
| Rice husk (Tangerang) | 20,359 | 17,559 | 0,141 | 0,033 | 0,091 |
| Black Ash (Karawang) | 33,572 | 31,189 | 0,433 | 0,137 | 0,315 |
| Black Ash (Tangerang) | 33,555 | 30,822 | 0,504 | 0,115 | 0,342 |
| White Ash (Karawang) | 99,095 | 91,306 | 0,759 | 0,164 | 0,572 |
| White Ash (Tangerang) | 98,097 | 90,703 | 0,914 | 0,190 | 0,571 |

Note : Al₂O₃ not detected

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- The white ash producing by burning rice husk contain a high Silica (SiO₂) content. Based on the average of

20.172 % SiO_2 from rice husk (dry basis) the annual production of SiO_2 when totally burned to white ash calculated in Table III.

Table III. Total paddy production in Indonesia and equivalent SiO_2 (1969 - 1976).

| Year | Production (metric tons) | SiO_2 (metric tons) |
|------|-----------------------------|---------------------------------|
| 1969 | 23,555,847 | 1,187,921 |
| 1970 | 25,269,238 | 1,274,327 |
| 1971 | 26,392,175 | 1,330,957 |
| 1972 | 25,351,110 | 1,278,456 |
| 1973 | 28,090,849 | 1,416,621 |
| 1974 | 29,376,492 | 1,481,456 |
| 1975 | 29,201,619 | 1,472,637 |
| 1976 | 23,300,939 | 1,175,066 |

- From the calculation in Table III, it is obvious that the SiO_2 attainable are more than 1,000,000 metric tons yearly. The weakness of this huge source of SiO_2 from rice husk is the economic aspect to collect rice husk/ash from small rice mills. Small units for utilizing this source of building material must be developed.

REFERENCES

1. BPS + Departemen Pertanian.
2. SUHARDI, ENGKUS KUSNAEDI, dan SRI SETIANINGSIH, 1978/79.
Laporan Penelitian. Balai Penelitian Industri, Jakarta.

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