

## THE JUMBO STOVE OF PESANTREN IBNUL QOYIM

Yuni Supriyati  
Pius Herin  
*Jaringan Kerja Tungku  
Indonesia (JKTI)*

The signboard with the name Pondok Pesantren Ibnul Qoyim, bearing the address Gandu Village, Sendang Tirto, Berbah Sleman, Jalan Wonosari KM 8.5 Yogyakarta for those coming to this area for the first time makes this *pesantren* (Islamic Boarding School) easy to find. The facilities at this address are for educating girls; while the location of the boys' school is in Tegalyoso Village, Sitimulyo, Piyungan, Bantul. As a result of the various locations of the boys' and girls' schools, there are two headmasters, Drs. Raichan Usman, for the girls' school, and Mr. Aceng Mustofa for the boys' school. The number of staff and teachers is more or less 40 people, while there are 223 pupils: 105 girls and 118 boys.

The school complex is relatively large and provides enough space for both the boys and girls. At the girls' school, the main area is composed of three separate buildings located on the right side of the street, while dining facilities are located on the left. The dining hall is broken up into four sections, the area for the children to eat, the kitchen, the firewood storage room, and finally the staff dining area.

### Cooking Activities

The manager of the *pesantren* has employed several people to assist in providing food for the pupils of the school. There are four cooks at the school, headed by one employee who used to be a pupil at the school. The head of the kitchen is responsible for providing groceries (bought daily) and also firewood for the kitchen. Two women, Mrs. Prapto and Mrs. Giyati, cook for the girls and two others, Mrs. Supri and Mrs. Widayati, cook for the boys. Their supervisor, Mr. Tris, maintains and repairs the kitchen



The Jumbo

facilities (the stoves, cutting boards, and kitchen utensils) and cleans the yard of the *pesantren* complex. The four cooks are responsible for managing available ingredients to cook and serve meals for hundreds of students and staff at the *pesantren* on a daily basis. Starting at 4:30 am, the four get ready to cook breakfast, lunch and dinner.

### Cooking with a “Jumbo” Improved Stove

Cooking for so many people requires kitchen equipment that is large, lots of firewood, and most importantly, a large-capacity stove that is energy efficient so that food can be cooked more quickly.

The idea to have a stove that can

cook mass quantities of food at once while still being efficient in operation has for a long time been the aim of the *pesantren's* management. Starting in the year 2000, two men originally from this area, Mr. Tris and Mr. Jumadi, were able to realize this idea. Based on their knowledge and with the assistance of Mr. Narno, a staff member of Yayasan Dian Desa, they began the work of building this “jumbo” ICS.

### The Stoves of the Pesantren: 3 Pot-Holes And 2 Chimneys

The above stove is called a “tasir” stove, because it is made from dirt and sand (“tanah liat” and “pasir”). Other materials needed to make this stove include rice hulls, kitchen ash, bricks, and an iron grate. The composition of clay, sand and rice hulls is 1:1:1. The clay is taken from the Piyungan hills where the quality of the material is very adhesive. One must prepare 2m<sup>3</sup> of clay for a stove of this scale. Construction will also use about 1500 bricks and one sack of cement to finish the outer layer. All the materials needed for making the stoves were provided by the *pesantren*.

The plan from the beginning was to build two stoves side-by-side. The first stove would have its own firebox with one large pot-hole for boiling water. The second stove would have a firebox with two pot-holes for cooking rice and vegetables. The total measurements of the entire construction when finished would be 2.8m x 1m x 0.8m.

Mr. Tris - as the one who made this stove - explained that he was hesitant at the beginning. After



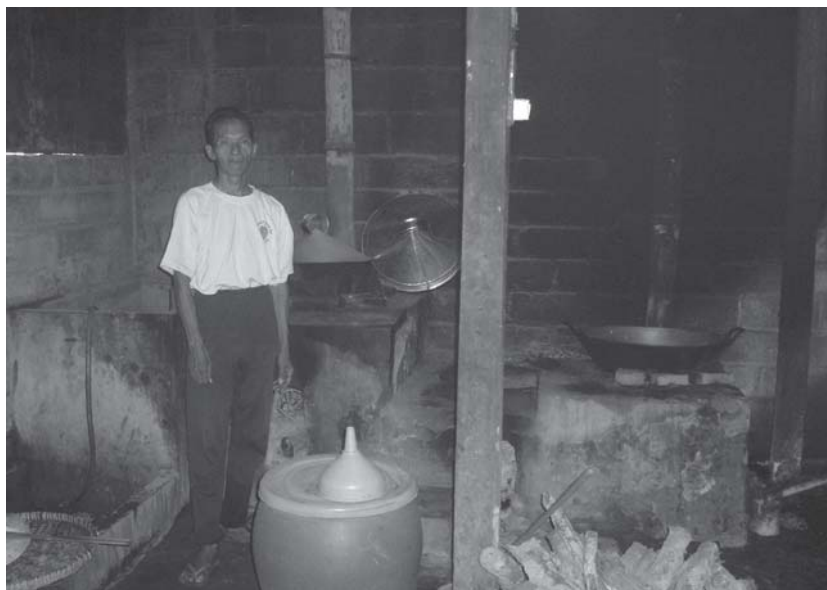
Cooking on Traditional Keren Stoves

following the instructions provided by Dian Desa, however, it turned out that building the stove was not as hard as he had imagined. First the materials and equipment needed must be prepared, and the materials must be inspected for quality. For example, in order to avoid making a stove that cracks easily, one should use sand that does not have a lot of small stones in it. If it does, the sand can be sifted to avoid this problem. In addition, the clay used should be of a type that is highly adhesive. Because every area has different types of clay, it is very important to clearly understand the quality of the clay that will be used for building the stove.

Once all the materials are ready, one must mix the clay, sand and

rice hulls. The mixture should be made by foot so that it is even. While mixing, one should not add too much water, otherwise the stove body will not be strong and will crack easily. In order to reduce the amount of water in the mixture, one can use an appropriate amount of ash. Be careful to insure that all the materials are well-mixed. In order to know if the mixture is ready, take a handful of clay, make it into a ball, and drop it from waist-height to the ground. If the ball cracks, that means that the mixture is not yet even and there is too much sand. If the ball drops on the ground in the shape of a mound but the top surface does not break open that shows that the mixture is ready. If the ball drops on the ground and flattens out on impact that shows that there is too much water in the mixture.

Next one must make the stove from the “tasir” mixture. Usually one uses a mold that has already been made, or one can form the stove from clay and then cut holes out of certain parts. The second method was used to build these jumbo



Pak Tris with the Jumbo

stoves, with the clay and brick formed for each separate section. Bricks are used to reinforce the stove body. Once the structure is formed, one must cut the pot-holes, the firebox entrance, etc. out of the clay.

Finally, one finishes the stove by polishing it and fixing cracks that developed when the stove was drying. A dirt and sand mixture is used to fix cracked areas.

Usually, it takes three days for the stove to dry out. After three days, the stove can be fired continuously for one week by always filling the firebox with fuel and keeping the fire going during the daylight and nighttime hours.

### Measurements

The size of the stove is purposely large to fulfill the needs of cooking for hundreds of students. In the first stove, the pot for boiling water rests sunk in to the pot-hole in order to increase the contact area of heat to the pan. Thus a 51 cm-wide pot that is 57 cm tall rests on a pot-hole that is 54 cm so that more than 75% of its volume rests below the surface of the stove. With this design it has been proven that 80 liters of water boils faster and the stove can then be used to boil water again (water is boiled three times a day.)

On the second, adjacent stove, both pot-holes are 49 cm in diameter. With this size pot-hole the pot for cooking rice (54 cm) and the pot for cooking vegetables (70 cm) sit above the pot-hole.

There is also an iron grate with 1 ½ cm between rows. This distance is considered ideal for allowing complete combustion of fuel and the remaining ash will fall through



49 cm Pot-Hole for Cooking Rice

the grate to the ash removal chamber. This ash chamber can be found in both stoves and keeps them cleaner. Two chimneys with 15 cm diameters are affixed to the stoves. The chimneys are approximately 5.5 m tall and go out through the ceiling of the house. The chimneys allow the smoke produced in using the stove to be sent out to the open air through the roof so that the kitchen is free from smoke. At the bottom of the chimney on each stove is a hole from which one can remove soot that has collected on the inside walls of the chimney and then been scraped off.

### The Advantages of The Jumbo

These two stoves can cook 17 kg of rice, 80 liters of drinking water, and 4 liters of vegetables with gravy for about 125 people every time they are used. Even so, The Jumbo is very fuel efficient. In one use, only five to six cords of wood will be used. One cord consists of 6-8 small logs, about 40-60 cm long with a diameter of 7.5 cm. The amount of wood used in one

burning is between 0.3 and 0.4m<sup>3</sup>. The types of wood used are teak, mahogany, jack fruit and tamarind which is bought from traders in Pathuk area of Gunung Kidul. Usually as much as one truck-load of wood is bought per month, already cut to size and brought directly to the *pesantren* grounds for between 600,000 and 800,000 rupiah. This cost is relatively small compared to the cooking capacity that is unleashed using this wood.

In addition, the Jumbo ICS is more time-efficient than normal stoves: The Jumbo can cook breakfast and lunch in just 5-6 hours, while it used to take 7-8 hours using the same cooking methods on the old stove.

From the aspect of operating the stove, the new Jumbo is much safer to use. With the two chimneys belching smoke out above the roof, the stove itself is free from smoke which usually affects the cook. Many cooks have recognized that using the Jumbo ICS they are able to sit at the stove for longer and do not get as tired in the kitchen as they used to. Using the old stoves

their eyes would hurt and water and their breath was often affected by the pollution in the air. The kitchen also became uncomfortable, stuffy, and with black and darkened walls from all the soot.

### Maintaining the Stoves

The stoves have been in operation for more than three years and there has yet to be a time when disrepair caused the stoves not to function properly. This efficiency is because of the maintenance and repairs done by Mr. Tris, the one who is responsible if the stove breaks down.

To make a durable stove that will not easily break, Pak Tris must clean the ash removal chamber before each use to allow enough secondary airflow ventilation into the firebox. The result is that combustion is more complete and the stove is cleaner. In addition, every two months, the two chimneys are cleaned by inserting long pieces of bamboo from above the roof and scraping them along the insides of the chimney so that the soot falls down. The soot is then collected from the soot removal chamber.

Not only do the stoves need to be taken care of through physical repair and maintenance, but proper cooking techniques are also important to preserving the life of the stove. Pak Tris watches carefully when the cooks operate the stoves. For example, in the use of firewood, he must remind them not to completely fill the firebox with wood. This will burn more wood than necessary and also will cause the mouth of the firebox to become chipped and broken. They also must be careful in how they



Cords of Firewood

place the cooking equipment, because if they are careless, the weight of the pans filled with food can occasionally break the pot-hole or the stove body.

Another method of maintaining the health of the stove is to allow the fire to die out by itself. Before, cooks would throw water on the fire to put it out while the stove was still hot. This action caused the walls of the stove to break. It is also not the best option from the perspective of saving firewood, because fuel that could still be used is thrown away for no reason. The best way to put out the fire is by taking burning cinders and placing them in ash or sand contained in a bucket located next to the stove. Using this method the fire will be put out without creating much smoke or damaging the body of the stove. The cooks at this *pesantren*, however, have already been operating this stove for a long time (three years) and thus are accustomed to preparing exactly the amount of wood for cooking once. The result is that there are few cinders leftover when they are done cooking.

Maintaining the stove also includes repairing it. With knowledge gained from Dian Desa and his own ability, Pak Tris tries to repair stoves as soon as they are broken.

The most recent repair was patching the supports for the pot-holes that fell in or became chipped. The hardest repair he has had to make was to the mouth of the firebox. The stove was damaged when the brick right at the level of the grate in the mouth of the stove broke, damaging the firebox. To repair the stove, he made a new mouth to the firebox using a “tasir” mixture of dirt, sand, and rice hulls with bricks. Now, that stove can be used again without problems.

### The Improved “Jumbo” Stove: Not the Last

As mentioned by the cooks, cooking activities in the kitchen truly depend on the performance of The Jumbo. In accordance with its value to the success of the kitchen, extra attention and supervision are offered to those working with the stoves of this *pesantren*. The factors that the cooking capacity of the stove is large, it is efficient in the use of fuel, clean and free from pollution means that this stove is not just an alternative for cooking, but the first choice of stoves at this *pesantren*. On top of these advantageous design elements, we also must consider that the prices of gas and kerosene will soon be going up and the use of this kind of large size biomass-burning stove could become a stepping-stone for those who can no longer afford gas and kerosene.

The Improved “Jumbo” stove is just one of a long line of technology innovations that have been, and will continue to be developed. There is just one goal for all: to be able to fulfill the needs of many communities in accordance with their current conditions. *www*