

# Firewood In Besongabang

Quick report prepared by Pearly Wong, Groundwork volunteer  
8/17/14, updated 9/16/14, 9/26/14, 10/2/14

There are four ways of getting firewood in Besongabang.

1. Regular clearing and maintenance of one's own farmland, and bring back a few logs on daily or weekly basis to house.
2. Clearing/burning of a fallowed land<sup>1</sup>, hire a truck to transport all logs to house
3. Collecting dried wood or fallen logs from forest nearby their farmland
4. Bid on a woody tree on someone else's farm, and hire labour to cut and transport them.

Almost all families who own farm plots, regardless of number of household members, regardless of farm land sizes, have sufficient firewood supply from method 1 and 2. They do not grow any plant merely for firewood purposes, as they do not cut down fresh tree for firewood, but only gathered dried wood (dead trees) or fallen logs. People usually first target the dried out branches, and eventually the whole tree trunk if they become dry enough. People also do NOT bother to harvest any wood from their backyard/home garden as they perceive the wood from the farm plot is sufficient. However, if they have a big farm plot located at the back of their houses, they will prefer to use firewood from those farm plots due to the shorter distance required to carry the firewood. A woman who used to obtain her firewood from the forest, is now getting firewood from the school farm (2 acres), which according to her, is the firewood source of some others as well. For this reason, it is difficult to estimate the land required to grow fuel wood for one family. Method 3 is used by those whose farms are bordered by forests. Method 4 is usually employed by family which has a shortage of labour to work in a farm.

One example is used here to illustrate how much wood an existing farmland can provide for a family. A farmer is currently holding 3 acres of food crop farmland, and 5 acres of cash crop plantation. He harvested maximum 10 logs (approximately 10kg each) from his farm for his family of 6 every week. In addition, he is selling surplus 600-700 kg of firewood every 3-6 months, bringing them an income of 17000-23000 franc (US\$36-49) each time. That is approximately 900kg-1000kg of wood produced by each acre of his farm land per year.

By asking about number of family members, how much and how often is firewood being brought into the house, I come up with a very a rough estimate of how much a household member consume per week. The figure ranges from 7 kg/person/week to 20 kg/person/week. See table below. However, other than cooking, families also use firewood to process palm oil. They prefer to use large logs for this purpose and smaller branches for cooking.

---

<sup>1</sup> They rotate farm plots here every few years so that soil can regain its fertility. So some of the land will be left to fallow for a few years, and natural trees and bushes will grow in the farmland during the following period.

\* Frying gari is one type of cooking that consumes a lot of firewood. They can do it as frequently as once a week.

**Table 1: Consumption of firewood by household**

Household members	Amount of logs	Approximate weight of each log (kg)	Frequency of bringing	Average consumption (kg/person/week)
2	2	10-15	weekly	10-15
3	3 or more	7	weekly	7
4	6	10	weekly	15
6	10	10	weekly	16
7	-	70	Twice weekly	20
7	2	5-10	daily	10-20
11	10	10	weekly	9



**Figure 1: burning firewood to process palm oil**

Palm oil wastes can be used together with firewood for cooking, and that will increase the efficiency and reduce the amount of firewood needed.



**Figure 2 Palm oil wastes used together with firewood, this one will last for 1-2 weeks for a family of 5**



**Figure 3: when used together with palm oil waste, this pile can last for a month for a family of 5**

Good firewood producing trees include mango, plum, kola, rubber, *ebony*, *opepe*, *sapele*, umbrella tress, and other timber trees. But generally all kinds of woody materials including pruning of fruit trees and shrubs can be used for firewood if needed.

Taking into consideration the issue of sustainability (population is growing and there is no active planting of trees, other than cash crop), we can consider trying to sensitize community members to start using wood that can be collected from their backyard and growing their own firewood. For now, there are no such practices.



**Figure 4: a family of 6 said that they use 10 of these logs for a week.**



**Figure 5: this is for 2 weeks for the family of 4**



**Figure 6: this will last a family of 3 for half a year**



**Figure 7: this pile is estimated to last a family of 10 for 2 weeks**



**Figure 8: this is estimated to last a family of 8 for 1 week**



**Figure 9: half a week for a family of 6 (the family used 3 logs which weigh 20kg or more each week)**

**Cost of Firewood:**

There are few people purchasing firewood in the village. Even the elderly rely on neighbours and relatives to bring them firewood. Out of more than 20 families I visited, only 2 ever bought firewood

from others. In addition, as most arrangements are made informally, based on relationships between buyers and sellers and upon negotiation each time, it is difficult to tell a standard price for firewood.

There are two ways of buying firewood in the village –

1. To purchase trees from others' farmland, hire labour to cut and transport them. I collected two examples using this method to give a very rough estimation of the possible cost of firewood. A family of 3 pays about 8000 franc (US\$17) for half a year of supply. A woman who is cooking food for sale (less than 50 portions per day) pays about 45000 franc (US\$96) (30,000 (US\$64) of which is for transportation) for half a year of supply. She also complements her cooking with two sawdust stoves.
2. To buy the firewood already cut into pieces of logs. The price depends on how big is the log and the type of log. An ironwood log (hard and excellent for burning) can be sold for 700 franc (US\$1.50), while a whitewood log of similar size (see picture below) can be sold for 500 franc (US\$1.06). Villagers usually purchase them during rainy season when their own wood is wet, so that they can mix the dried firewood with their own. The seller gained the firewood from people who are clearing their fallowed land (slash-and-burn). He is also using the wood for carpentry work.



## **Charcoal**

Few people are using charcoal in the village. Only those who fry puff puff (a local breakfast, basically fried flour balls), grill fish and bake bread for sale will use them. People do not use it for regular cooking. Some people also use charcoal for ironing. Most people collect their charcoal from their own fireplace. Charcoal can be produced when one uses very good firewood for burning. A bucket of around 15L can sell for 800-1000franc (US\$1.70-2.13).

## **Comments on fuel and exploration of improved wood cook stoves**

Email September 20, 2014

Hi Huck.

I have talked to a few people and they all seem to be interested in making cook stove. I will try to involve a welder or someone with experience in the group. Keeping in mind they always give positive answers, we can only see their true commitment while executing. If we are to test it here we will need quite detailed instructions here.

I have asked about other fuels. They do have corn cobs. Some have nut shells if they sell groundnuts but since they have no idea that they can be fuel, nobody is keeping them. But they can be used to complement the firewood if we tell them. I think people would be very happy with stove that takes in a variety of fuels so that they can basically just throw things in.

It is important to understand the slash and burn system in the village and its linkages with firewood. People usually leave their land to fallow for 5 years and will burn with fire to clear the land for cultivation (usually in March). Some of them transport their firewood to use but many also just let the wood burn. They even produce charcoal this way but throw them away if nobody request for them. And household produce charcoal too sometimes when burning their firewood. The perception is that firewood is abundant. Timothy says he has lots of wood rotten in his farmland. So many might not switch to other fuel that cost money.

But if we start to encourage the use of other easily available materials to complement firewood, this will in a way reduce firewood use and helping environment sustainability. Charcoal like sawdust is a new introduction into the village. I would say it has its potential if we let people know as they cook faster than firewood. It will not substitute firewood but it would help if they are used to complement firewood if our stove takes it too.

Pearly

-----

## **How Do People Cut and Transport Firewood?**

People typically carry firewood on their head and carry them from their farm back to their home. It is usual to encounter people carrying wood on their head in the village. Sometimes it is a big single log, sometimes it is a pile of wood sticks and smaller logs bundled together. However when people do clearing on their fallowed land, they sometimes hire a truck to transport all firewood from the farmland to their houses.

Whether or not they cut the wood depends on the kind of firewood they can find from their farms. If it is a big and hard wood, using an axe is necessary. I have observed several times people breaking wood with an axe. Usually I see a young man doing it for older women. It is a difficult job, time and energy consuming. But people like hardwood because it burns really well, and the price of hardwood is typically higher if people choose to purchase it. If it is a smaller log or stick, they will just break them with hands, or feed them directly into the fire. I can't say which is more used than the other because it depends on what they can find in their farms, but usually they use a mixture of big logs cut into smaller sizes and smaller branches or sticks they can find.

I have been trying to follow people to their farms to collect firewood. But I was told this is best done when the season is drier. I will do so once the opportunity arises.

Below are some pictures to illustrate what I described. There are photos showing how a fire is lighted. However this particular user is only using small sticks, some long sticks this particular time.

Carrying firewood on their heads from their farms



Different sizes of firewood



Firewood cut into pieces ready for feeding into fire



## Steps of Making Fire



Figure 10: she first places the palm oil waste into the middle of three stones then light it up with matches



Figure 11: then she slowly moves wood sticks closer to the center



Figure 12: she is now putting the end of wood sticks on top of the palm wastes



Figure 13: more fire is needed so she continued to light two more matches



Figure 14: the fire seems to be burning ok, the flame seems to be coming from the burning palm oil wastes.



Figure 15: she went out to pick up a phone call and came back to realize the fire was not burning well. So she went to get some small burning sticks from her neighbour's kitchen and fed her own. This is a common practice



Figure 16: although they insist the fire is not difficult to start, the process definitely needs close monitoring and sometimes multiple efforts

### Example of Firewood Collection from Farm

We have chosen a nearby farmland to record firewood collection. It took 20-30 minutes walking at a leisure pace from the nearest houses. The route passes through a stream where people sometimes wash clothes. The road can be muddy during wet season.



Figure 17: trekking to the nearby farm



Figure 18: Stream to wade through. Some villagers do laundry here

In order to transport the wood using head, a cushion is required. Takor collected dried banana leaves on the way to make the cushions for us and himself. See pictures below.





We arrived at a secondary forest ( a fallowed land) belonging to Takor's neighbour. Takor locate a dry wood. Dry wood can be indicated with absence of leaves and the colour of tree bark after removing the skin.



Figure 19: Takor pointing at the tree located. There is a fresh tree of the same species right beside the located tree.



Figure 20: it's not obvious but one can see the tree branch without any tree leaves



Figure 21: This is a fresh tree. People do not cut it down for firewood purpose.



Figure 22: This is a dry tree

However, as in any logging activity, Takor needs to cut one nearby fresh tree so that there will be space for the dry tree to fall onto

Figure 23: Takor and Timothy started cutting the tree. We were asked to retreat for safety purpose.



Figure 24: Takor is now breaking up the dry tree after it fell to the ground. The cut fresh tree is right beside.



Figure 25: wood cut into smaller parts for transport. The dry tree trunk is eventually cut into 4-5 pieces of bigger logs, in addition to 5 smaller branches. This tree alone needs at least 3-4 people to transport.



**Figure 26: Takor then divided the logs to be carried by each.**

We then carry firewood for the 30 minutes trek back to the house, wading through the stream at some point.

On our way, we can also easily see fallen logs on the ground. Those which are not rotten can be carried back as firewood. The amount of rotten logs on the ground is big, and hence a perception that firewood is abundant.



Figure 27: These are rotten wood and cannot be used as firewood



Figure 28: This dry fallen wood can be collected for firewood purpose since it has not yet rotten.



Figure 29: Cary experimenting on carrying log on head



Figure 30: Pearly performing balancing act

#### Some Questions:

1. **What tools are used to cut trees for firewood?** Normal households only use machetes to cut down trees for firewood. For breaking them, they sometimes use machete and sometimes axes. If people are clearing forests, or wish to buy some bigger hard wood trees for firewood purposes, they will hire operators with engine saws to cut them and then pay for the transportation of logs back to their place, but this is often expensive. I have previously reported on this on the firewood document.
2. **What percentage of wood is 4-6" and larger diameter?** It is difficult to estimate the percentage. It depends on availability of labor and wood in the farmland. For women they would usually pick up fallen branches and sticks on the ground, because they lack the strength to cut the trees and break them into pieces later. For men, they would prefer cutting big trees for several reasons: they burn slower compared to smaller sticks and the fallen branches can be wet during the rainy season. Also, it depends on whether one can find dry trees or dry fallen branches on a particular day. They will not cut down fresh trees or pick up wet wood.
3. **Do they split the larger logs before using in the fire?** Yes, for the logs, they usually break them into 2 to 3 inches in diameter and half a meter length. For branches and sticks with smaller diameter than 2-3 inches (can be longer than half a meter), they will feed them directly into fire. However they mention that having one or two bigger wood together with smaller branches can sustain the fire for a longer time.
4. **I saw them carrying 6' length logs back from the farm. Do they cut it to shorter lengths once it is back home?** They will definitely cut the logs into smaller pieces - shorter length and smaller

diameters. But not necessarily immediately. A man is required to do this job so it depends on his availability.

5. **Do they do anything to dry the wood?** If it is a fresh tree, they will leave it in shade for at least 6 months before using them. If the wood is considered wet (appear to be so or unable to start fire), they will dry them under the sun for a few days. They also dry wood above fire after cutting. See the next answer.
6. **Where do they store wood? How much and how long?** The procedure is once you cut the wood into pieces, they will place them on a shelf on top of the fire, so that they can be dried by the smoke. The capacity of the shelf varies, but typically 1-2 weeks (various pictures are available in the Firewood report). They will continuously bring firewood at the mean time. So one can see piles of uncut wood beside the kitchen while the shelf above the fire is still full. Our firewood weighing experiments measured the weight of all firewood, cut and uncut, stored in kitchens by the respective families. The weights are 33kg, 66kg and 123kg which last the respective family for 12 days, 12 days and 26 days (the details are in the Kitchen report). They store all their firewood inside kitchen or under shade right beside the kitchen. Some people will store much firewood during dry season for the use of wet season. Some people store much wood after clearing their fallowed land. In those cases, they have an extra enclosed shed entirely filled with firewood.

Large logs are usually only found in places where people are selling firewood, or storing firewood after clearing their fallowed land. Regular firewood collection will not have logs of those sizes, as they do not possess the engine saws to cut them.