

Pack 106, Item 7

Type: Backgrounder

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**Backgrounder: Post-harvest activities in cassava**

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***Introduction***

Cassava originated in tropical South America. It was introduced to the Congo Basin in the mid-1500s, and to East Africa in the 1700s. In Africa, 93 percent of cassava produced is consumed as food, making it vital for food security in rural households. Over 500 million people in sub-Saharan Africa rely on cassava as a staple.

Tanzania is the fourth largest cassava producer in Africa, producing about seven million tonnes annually in many parts of the country. Eighty-four per cent of this is used as human food.

Cassava is mostly grown at low altitudes in Tanzania, though it can be grown up to 1500 metres and perhaps higher, and in temperatures of 18 to 25 degrees Centigrade. It thrives in both wet and dry climates across Tanzania, and in soils with a pH from 4 to 9.

Besides being sold as roots, cassava can be processed into confectionaries, high quality cassava flour (HQCF), glue, plywood, paper, starch, and as a binder in pharmaceutical drugs. Cassava chips are used to make animal feed, and cassava pellets to make alcohol.

*For further general background information on cassava, see documents 2 and 3.*

***Why is this subject important to listeners?***

* Home-based processing increases the market value of freshly harvested cassava.
* Post-harvest activities like drying and smoking increase cassava’s shelf life by up to one year.
* Farmers can learn post-harvest practices to preserve fresh cassava, including peeling, drying, smoking, and processing.

***What are some key facts?***

* Adding value to raw cassava increases farmers’ earning potential.
* Farmers require post-harvest handling skills to avoid losses.
* Joining a farmers’ group helps farmers negotiate for better prices.

***What are the big post-harvest challenges with cassava?***

* Freshly harvested cassava is highly perishable.
* Broken cassava roots rot and spoil faster.
* Poor roads make it difficult to distribute raw or processed cassava to markets.
* Lack of clean water and electricity hinders post-harvest processing.
* Inadequate knowledge of processing and adding value

***Gender aspects of post-harvest cassava activities***

* Men and women are involved in cassava at specific points in the value chain.
* Men generally clear land, plough, and plant, while women weed, harvest, transport, store, and process cassava.
* Where cassava incomes are high, men typically take over processing and marketing, and where incomes are low, women sell the crop.
* Men generally decide how cassava products are to be sold, and manage the cash from sales.

***Key information about cassava post-harvest activities***

**Storage**

* Cassava can be stored in the ground and harvested when needed.
* Freshly harvested cassava can be briefly stored in sacks, but after two days the roots become discoloured, indicating spoilage.
* After processing, cassava can be stored in sacks, large round woven baskets, on the floor of the house, and in the attic.
* The best way to store cassava is by peeling it when raw and grating it into mash, which is then dried with solar driers or in the sun, in hygienic conditions.
* Dried cassava chips last up to three months before insect attack, but when smoked, last for up to a year.

*For further information on storage, see documents 4 and 6.*

**Processing**

Post-harvest processing of cassava greatly increases its commercial value, and makes it safer for consumption. Cassava roots contain a substance called hydrogen cyanide, which is toxic to human beings. Bitter cassava contains up to 50 times as much cyanide as sweet cassava. Grating reduces the cyanide content of bitter cassava to acceptable levels. Cassava can be processed into chips, the in-demand High Quality Cassava Flour (HQCF), and starch.

***Processing tools***

Basic cassava processing tools such as manual or powered graters, chippers, pressers, and mills reduce processing time by 75 percent and cassava losses by 50 percent. Villages in Ghana, Nigeria, and Uganda have mechanized tools, but only a small percentage of Tanzanian villages have access to mills because villages lack petroleum and electricity.

***Processing raw cassava roots into chips***

1. Select, peel, and wash good quality roots.
2. Chip the roots with a manual or powered chipper.
3. Spread the chips on a raised platform off the ground and dry them in the sun or with a mechanical or solar dryer.

Cassava chips are often infested by insects during the drying process. So it’s vital to shorten the drying time by breaking them into smaller pieces that dry faster.

Dry the chips to a point where they break easily but don’t crumble, and then package.

Cassava chips can be smoked by placing them on a raised platform or an attic above a fireplace.

Keep bitter cassava roots in water for four days before processing to allow release of poisonous cyanide gas.

*For further information on making cassava chips, see documents 1 and 4.*

***Making High Quality Cassava Flour (HQCF)***

**Step 1: Selecting roots**

**Select fresh, firm, mature, healthy, and unbruised cassava roots. Their flesh should be white (for white varieties), without cracks, and with few fibrous roots.**

**Step 2: Peeling**

**Peel the roots and remove stalks, woody tips, and fibrous roots. After drying, peels can be used as animal feed or to make compost. Wash peelers and graters before and after use.**

**Step 3: Washing**

**Wash the peeled cassava roots twice with clean water to remove dirt, soil, leaves, or other solid impurities.**

**Step 4: Grating**

**To grate, use a mild or stainless steel grater that turns cassava roots into a fine mash.**

**Step 5: Pressing**

**Pack the grated cassava mash into a clean bag like a jute or sisal sack. Press the sack hard with a screw press or hydraulic jack, or use other means to drain excess water until the mash is crumbly in texture.**

**Step 6: Drying**

**Spread the pressed cassava mash thinly on a clean black plastic sheet, placed on a gently sloping platform that is raised off the ground. Dry in full sun until the moisture level is below 12 percent. At that stage, the chips crack when handled. Cover the drying mash with a net to keep away insects and birds. Though expensive, solar, stove, and hot-air dryers result in more reliable and higher quality drying.**

**Step 7: Milling**

**Use a hammer mill (village posho mill or *kinu*) to mill the dried cassava mash to flour.**

**Step 8: Sifting**

**Sieve the milled cassava flour to remove lumps and fibrous materials. This ensures high-quality, free-flowing flour which is free of fibre and has a good particle size.**

**Step 9: Packaging and storing**

Pack the sifted cassava flour into airtight, moisture-proof plastic bags, seal with a burning candle, and label with the date of manufacture and expiry date.

Pack the bags into cartons to protect them from light and store them in a well-ventilated, cool and dry place. Cassava flour has a shelf life of 12 months.

Cassava flour can also be made by incorporating a fermentation stage which produces a slightly sour product called *gari* in West Africa. Fermentation can occur during the dewatering stage (step 5), or by soaking whole or cut roots in water for three to five days. The fermentation process must be carefully monitored to guarantee complete release of poisonous cyanide gas from roots, and ensure the flour has an acceptable texture and flavour.

*For further information on making HQCF, see documents 1and 4.*

***Making cassava starch***

Cassava starch is used to make biscuits, breads, and puddings. It’s also an ingredient in non-food items like paper, pharmaceuticals, and textiles. Here’s how to make it.

1. Peel, wash, and grate cassava roots.
2. Add three times as much clean water as cassava to a bucket, and let the mixture settle for 30 to 45 minutes.
3. Pour the mixture through a clean piece of cloth and leave it to settle for an hour or more.
4. Pour off the water, and break the settled pieces at the bottom of the bucket into smaller pieces.
5. Dry the pieces in the sun or by artificial drying for six hours or more.
6. Mill the cassava to get the starch.

*For further information on making cassava starch, see document 4.*

***New opportunities for processed cassava in Tanzania***

Because wheat flour is more expensive than HQCF in Tanzania, there are marketing opportunities, especially for marketing groups who can guarantee higher volumes of HQCF. Bakeries in Mtwara are now blending wheat flour with 10 percent HQCF because of the high costs of shipping wheat from Dar es Salaam. Tanzanian authorities are also permitting wheat bread to be blended with up to 30 percent other flours. Biscuit manufacturers and millers are also considering making blended wheat flour products with HQCF.

*Animal feed*

There may be increased opportunities for small-scale producers and processors to supply higher quality cassava chips (“improved” *makopa*) to the steadily growing livestock feed industry, especially for poultry feed.

*For further information on opportunities for processed cassava, see document2.*

**Marketing**

Most cassava farmers in Tanzania sell at least some cassava, as well as using it for home consumption. Farmers normally sell their cassava as individuals rather than through groups, which lessens their bargaining power.

While opportunities for processed cassava products are increasing in Tanzania, there are challenges. The market for processed cassava products is not guaranteed and rural farmers lack information on fair market prices. As a result, they sell their cassava at low prices. Farmers are not organized in groups, so lack the strength in numbers to successfully negotiate with buyers for fair prices. Distribution channels and marketers are also lacking, and roads are in poor condition, making transport of cassava products difficult and costly. Rural farmers who wish to mechanize processing lack access to financing. Financial institutions are wary of cassava-related ventures due to the crop’s image, and high interest rates dissuade these farmers from taking loans.

*For further information on marketing, see documents 2, 5, and 6.*

***Where can I find other resources on this topic?***

*Documents*

1. ACP-EU Technical Centre for Agricultural and Rural Cooperation (CTA), 2007. *Making High-Quality Cassava Flour*. CTA Practical Guide Series, No. 5. <http://teca.fao.org/sites/default/files/technology_files/Making%20High%20quality%20Cassava%20Flour.pdf> (831 KB)
2. Ben Bennett, Diego Naziri, Grace Mahende, and Elifatio Towo, 2012. *C:AVA (Cassava Adding value for Africa): Driving demand for cassava in Tanzania: The next steps*. C:AVA. University of Greenwich and The Natural Resources Institute. [https://agriknowledge.org/downloads/2v23vt38m](https://agriknowledge.org/downloads/2v23vt38m%20) (1.41 MB)
3. FAO/IFAD, 2005: *A review of cassava in Africa with country case studies on Nigeria, Ghana, the United Republic of Tanzania, Uganda and Benin*. <http://www.fao.org/docrep/009/a0154e/A0154E00.HTM#TOC>
4. Neil Noble, 2006. *Cassava processing*. Practical Action. Download at: <http://practicalaction.org/cassava-processing> (346 KB)
5. Ponsian T. Sewando, 2012. Urban Markets-Linked Cassava Value Chain in Morogoro Rural District, Tanzania. *Journal of Sustainable Development in Africa*, Volume 14, No. 3, 2012 <http://www.jsd-africa.com/Jsda/Vol14No3-Summer2012A/PDF/Urban%20Markets-Linked%20Cassava%20Value%20Chain.Ponsian%20Sewando.pdf>
6. Resources in Farm Radio Resource Pack #99. See: <http://scripts.farmradio.fm/radio-resource-packs/page/2/>

## Acknowledgements

Contributed by: James Karuga, Science journalist, based on Pack 99, Item 1, [Cassava value chain in Tanzania: Post-harvest](http://scripts.farmradio.fm/radio-resource-packs/pakage-99-cassava-the-post-harvest-value-chain/cassava-value-chain-in-tanzania-post-harvest/).

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