Bitter cassava and women:
an intriguing response to food security

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Studies in Africa and South America show that cassava is regarded as two different crops, the bitter and the sweet. Bitter cassava provides the staple food, whereas sweet cassava is the vegetable, the snack or the thirst quencher. All cassava contains a certain level of toxic cyanogenic glucosides. Bitter cassava contains higher levels of these toxins, and is toxic if not processed.

A devoted couple processes their cassava for drying into makaka, for storing. Photo: Linley Chiwona-Karltun

The detoxification process involves a sequence of steps that have to be followed in order to create a safe food product. The methods are as variable as the desired end products, ranging from the most effective process of soaking, fermentation and drying of the roots, to grating, fermenting and frying, or simply drying the roots. The final results are flour, granular grits or pieces of dried roots that can either be stored as they are, milled/pounded into flour or boiled separately or together with legumes or vegetables. Sweet cassava can be eaten as it is, boiled, roasted or fried as the palate and resources dictate.

It has been observed and documented that farmers not only prefer, but also grow a higher proportion of bitter cassava cultivars than sweet cultivars. This fact continues to intrigue scientists, and we have been interested in understanding why farmers grow bitter and toxic cassava in Malawi. Our research uses a problem-based approach, and integrated methodologies that range from participatory research to natural sciences and emerging advances in biotechnology, in order to further understand the interactions between social and biological factors in farmer decision-making.

Bitterness – a reason for cultivation

The results of our research show that bitter cassava cultivars are highly preferred, particularly by women, because they provide food security - locally termed as kuvikilia. Bitter cassava cultivars provide food security in three ways:

1) the toxin deters foraging rodents and pests from feasting on the crop;
2) the need to process the tubers directly after they are harvested deters thieving from the field (processing is largely a women's domain); and
3) as the processing adds value in terms of time invested, the social obligation of sharing cassava with your neighbours is reduced.

These three factors are of major importance to women farmers, especially to women farmers that are, *de jure* or *de facto*, single.

The preference for bitter cassava is not a local phenomena restricted to resource-poor farmers in Malawi. Studies in other parts of the world confirm that bitter cassava cultivars are preferred because they have superior end-product qualities and because the toxin protects the crop from intruders of all kinds, man and beast alike. "*We grow bitter, toxic cassava because it gives a certain level of food security, kuvikilia. If we are to grow sweet cassava, look at our neighbours! Their whole field was harvested by thieves while they slept and now they have no food. Nobody wants to die from hunger*".

Processing - a drudgery for the poor?

Breeding for reduction or removal of the toxin has featured very high on the research agenda for cassava. Interestingly enough, the women that are the custodians of this crop do not perceive the processing or the toxin to be a problem. Their major problems are the lack of mills to reduce the drudgery of pounding, and the lack of simple technologies that can be locally produced and maintained, such as low cost equipment for peeling or grating the roots. There is also a lack of infrastructure and markets, be it local, national or regional, for their products. The toxin could simply remain in cassava.

"Cassava is a wholesome crop, a complete crop. On top it is the relish (the sauce), in the middle it is the planting material and at the bottom it is the staple dish (kondowole). We do not need fertiliser to grow it, nor do we need money to grind it at the mill, chigawo chilera balanda" (cassava nurtures the poor).

For research to be of any use to resource poor farmers we need to listen to the voices of the farmers themselves:

- Cassava is a hardy crop, tolerant to dry spells.
- Cassava yields something even in nutrient poor soils, a characteristic hard to come by with any other staple crop, especially maize
- Cassava is tolerant to vermin
- Although cassava is somewhat tolerant to certain pests and diseases, we need varieties that are even more drought tolerant, more adaptive to poor nutrient soils
- We need more varieties that are even better than the ones we have now, high yielding, bitter, early maturing, high dry matter content and good storage qualities.

Give us our daily maize

One wonders if the thievery is due to the current food crisis in Malawi. In part yes, it has been exacerbated by the food shortage. However, the main problem stated by farmers is that they have fooled themselves by believing that maize is their only staple crop. When subsidies for fertiliser and seed were easily available they neglected cassava. Now poor farmers in Malawi simply cannot afford the inputs required to grow maize. Even more distressing is the fact that farmers that are able to grow maize produce barely enough to last throughout the year. To feed themselves, many Malawians resort to casual employment or

ganyu. Ganyu literary means food for work, and workers are paid either in money, or simply in food. However, this opportunity is very limited for women.

Today it is very difficult to find cassava-planting material in areas like Domasi, a modest trading and service centre along the Lilongwe – Zomba road in Malawi. People are hungry; last year's maize harvest rotted by excessive rain and this year's harvest is not enough. Even their stores of dried cassava are not enough. They are resorting to stealing fresh cassava roots (literally roots because they are not quite mature) from the fields. In normal times, the villagers would be out at night protecting their crops. This year, the villages are silent. The chiefs say that there's no point counting the number of hungry households any more. So many people are dead or dying from HIV/AIDS that every one who remains is hungry. There are households where only children remain, cared for by an elderly grandmother or a young girl.

Farmer to farmer cassava selection and multiplication

What Domasi and the hungry villagers all lack is access to stem cuttings and above all, stem cuttings with desirable characteristics, so that the acreage planted to desirable cassava varieties can be increased. Interaction with the farmers, mostly women, made us realise the need to include and involve farmers in the selection of new cassava cultivars. Exchange visits between farmers in different areas were arranged. In a relaxed, friendly environment, farmers could discuss their cassava cultivars with each other. The guidelines given for selection of the participants were that women and men should be equally represented; that literacy was not required but enthusiasm for and knowledge of cassava was decisive; and that a fair representation of the Cassava Clubs should be considered. Cassava Clubs have been established as a result of continued collaboration between the scientists and the farmers. Club members are usually not among the ultra poor or chronically food short, but form a somewhat homogenous class of poor smallholder farmers (0.2 – 0.5 hectares) who, in normal years, are potentially short of food (see UNDP 2001 for the classification of Malawi's poor and ultra-poor). The project has made a conscientious decision also to include the Village-to-Village movement in Domasi that is supporting HIV-AIDS affected households which fall into the ultra poor or chronically food short category.

Selection criteria for new cultivars

The farmers, together with scientists, have established local community multiplication fields in Domasi. Experience has shown that not just any cultivar is selected. Our preliminary results show:

- That whether woman or man, married or unmarried, the first question that farmers ask each other is: is it bitter or sweet? Although farmers in Domasi have almost exclusively grown sweet cassava, this preference is loosing importance. What these farmers wanted was mostly bitter cassava. Why? *"Look, look at our friends, they have so much cassava still standing in the field and all because it is bitter. If we had planted bitter cassava as we did in the past, we would also have food to eat"*. Simply put, food security.
- Secondly, the women were very interested in the starch quality of the tubers, as this was important in the preparation of the staple dish *nsima*, which is synonymous with food.
- Of equal importance was the yield, time to maturity and cooking time. These factors were equally important for both men and women.
- The men were more interested in the sweet cultivars, because the sweet cultivars have a well-established rural and urban market. Nevertheless, the very same men were just as interested in the bitter cultivars for ensuring overall food security.
- In the case of the Village-to-Village community-based NGO, all cultivars were of interest to meet the challenge of providing planting material, as well as food to the victims of HIV/AIDS and People Living With HIV/AIDS (PLWHA).

Most noteworthy

There was one aspect of the farmer-to-farmer selection that deserves extra mention. Women farmers that were single, *de jure* or *de facto*, were much more keen on selecting as many varieties as possible in order to minimise the risk for failure - what mattered was that they were bitter and that they were resilient cultivars with a reasonable yield. To put it in the words of one farmer during the exchange visit:

"We simply cannot boil away the fuel that brought us here, who knows when we will ever have the opportunity to travel, to see the unseen and to be hosted by other cassava farmers that have more cultivars than I have ever seen in my entire life. Madam, I want everything that we are allowed to take".

The community multiplication sites are carefully tended and guarded by the communities themselves with the aim of being self-sufficient.The multiplication sites established by women, especially single women, are undoubtedly in a head start position in terms of care.

The women were less concerned about knowing the names of the cultivars collected because they figured that with time they would learn to select those that best suited their environments. The men were very keen from the start to identify the new cultivars correctly, as it is important for the fresh sweet cassava market.

It is important to point out that although Domasi was traditionally a sweet cassava growing area before the dominance of maize, the knowledge of cassava processing still remains. Within this project we have made available simple processing peelers that are also used in the district where the farmers had the exchange visit. It is our hope that the local artisans will locally produce these peelers.

None of these community-based, women-to-women, women-to-men and men-to-men efforts will bring back those who have succumbed to the wrath of HIV/AIDS, but when and if they succeed, perhaps food security will take on a smiling human face in Domasi.

From Domasi, Malawi - the warm heart of Africa.

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