Engineer turns wasted fruit into hunger fighter for Haiti

By Christina Capecchi
The Catholic Spirit

Camille George, 48, keeps busy as the mother of four teens, attending her son’s baseball games and her daughters’ speech tournaments. But it’s not college or curfews that keeps her up at night: It’s global matters.

“It seems like the poor women of the world are often neglected,” said George, who attends Holy Spirit in St. Paul and teaches engineering at the University of St. Thomas. “It just amazes me that women in Africa can carry firewood or water on their heads for hours and the engineers of the world haven’t stepped forward.”

George has.

She’s using engineering to empower impoverished women across the globe by increasing their food supply and profitability. And she has a strategy: turning a plentiful but wasted fruit in Haiti into a hunger fighter.

Malnutrition is a widespread problem in Haiti. More than half of children under 5 are underweight and mothers feed them dirt to fill their bellies, reports Feed My Starving Children, a hunger-relief, non-profit organization in Brooklyn Park.

That’s why it pains Haitians, impoverished people who must import much of their food, that the breadfruit growing in abundance on their Caribbean island rots a day after it is picked. With only two annual harvests, each lasting a couple weeks, Haitians are left with a short-lived supply of the plentiful fruit.

Unless the breadfruit could be dried. Then, George said, it could be ground into flour and sold to help revitalize small villages economically and to feed schoolchildren.

In July 2003, George visited Haiti to help Compatible Technology International in St. Paul resolve the breadfruit problem. She realized that the key to preserving the fruit would be finding a simpler way to shred it. Once shredded, the fruit can dry in the sun in a few hours.

But shredding, George knows, is no easy task — especially when you’ve got such an enormous quantity and such a narrow time frame.

Last year, George instructed her senior engineering majors to create a simple manual device that Haitian women could use to shred the breadfruit. The students placed a shredding blade in the bottom of a bucket and attached a hand crank to the blade. They placed a metal plunger on the top of the bucket to push the breadfruit against the blade.

“It worked — well. “With the shredder, it’s totally doable for a single woman to do 80 pounds in one morning,” George said. That’s enough to sustain a family and to sell some, she noted.

CTI has created several recipes that use the ground breadfruit flour for pancakes, cookies and granola. It can be mixed with

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with crushed red beans or crushed sweet potatoes, along with molasses — all grown in Haiti — to make sweet, bite-sized snacks. Add a vitamin supplement, and the snack could fulfill 60 percent of a child's daily nutrition needs, George said.

Haitian mothers could sell breadfruit powder to baking or processing companies who, in turn, could sell it to schools — nourishing children, employing Haitians and providing women with much-needed income.

"There's nothing like having a small paycheck for self-esteem and social prominence in your village," George said.

The "Tommie Shredder," named after the university's mascot, still needs some refining, George said. Above all, it needs to be manufacturable in Haiti. The stainless steel blade currently used costs $25.

But thankfully, George's graduate student Jeff Weiss has risen to the challenge. He's devoting his master's thesis to perfecting the project George hopes to tackle.

Which means her dream is within reach.

"My five-year goal is to feed 100,000 Haitian school kids a day," she said.

The professor plans to post designs of the shredder online so anyone could download it. And she's going to Haiti visiting as many villages and churches as she can.

"I want to get past [having] one and two in the field," she said. "I want hundreds of them to impact the island."

But George isn't stopping there. The "Tommie Shredder" was last year's project, after all.

This school year, her students worked to improve the lives of women in Mali, West Africa, by creating another manual device enabling local women to profit from a natural resource. The Sahel, the band of Africa south of the Sahara desert that stretches from the west coast to the east coast, is home to all of the world's shea nuts. They're a hot commodity for cosmetics like moisturizers containing shea butter. Yet African women currently make very little money on the nuts, George said.

Once they're picked and sorted, the women grind them into powder. Then they add water and beat the substance with their hands for four to five back-wrenching hours. The shea butter surfaces as a foam layer on the top.

George said she worries the exhaustive process will preclude natives from profiting off their rightful gain.

"Shea nuts and shea trees have traditionally belonged to women and my big fear is that once there's money to be made that middle men will intervene and do something to help those less fortunate women," George said. "It's taken me a while but I'm in a position now where I'd like to have one senior design project a year devoted to humanitarian engineering.

"I thought I could someday come back and do something to help those less fortunate women," George said. "But I'm going to prove them wrong because my engineering will impact the lives of people who have been traditionally neglected by mainstream engineering."

To George, the projects are exactly what engineering should entail.

"I think this is true engineering, thinking outside the box to create simple solutions that can radically transform lives," she said.

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George and her three engineering seniors traveled to Mali last March to test their mixer. The Malians offered considerable suggestions, which the St. Thomas team promptly made, producing a revised prototype that the women embraced.

This summer, the mixer will begin a year-long test in Mali. George will go there again in January to seek further feedback.

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"So George's students devised the "Tommie Mixer" this spring, placing three big blades inside a bucket turned by a hand crank. It can produce shea butter in one hour.

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"Family and faith will fuel her, she said. George's father, a Polish immigrant who was once a refugee and prisoner of war, worked as an engineer on the Motorola team that devised the beeper in the '60s, which directly contributed to cell phones.

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Larry Matthews, a member of Assumption in Richfield who was the private benefactor of the "Tommie Shredder," is funding the "Tommie Mixers," too.

And a Manhattan non-profit organization called Shea Yeleen wants to organize the Malian women into cooperatives and help them sell their products at fair-trade.

"This has the potential of significantly changing women's lives all across the Sahel," George said.

Despite her progress, George has her critics.

"In my field, which is male-oriented, I do get a lot of people who don't think this engineering is up to snuff, that it's kind of weak or lame," she said, looking over the mixer and shredder.

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"He'd say, 'Put it in your head... Get educated and make a difference,'" George recalled. "When I'm 70 years old I want to be able to look back and say, 'I made a difference.'"

With her perseverance, that statement sounds likely.

"I don't give up," she said. "It's the Holy Spirit."