



Case 3

Coffee : Export Crop Provides Food Security

convert methane to CO₂, secure food and generate 50 million jobs

This article introduces the cascading of coffee waste on farms and in cities as one of the 100 innovations that shape The Blue Economy. This is part of a broad effort to stimulate entrepreneurship, competitiveness and employment.

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The Market

In 2009 the world consumed 126 million bags of coffee, good for 7.5 million tons of green beans ready to be roasted. Few people realize that in the harvesting, processing, roasting and brewing of coffee an estimated 99.7 percent of the biomass is discarded. While only 0.2% acquires value on the market, the remainder - rich in caffeine - is wasted. An estimated 12 million tons of agricultural waste is left to rot, generating millions of tons of methane gas and contributing to climate change. This makes coffee one of the most wasteful consumer products.

The world market for mushrooms - according to Professor Shuting Chang, the leading fungi scientist from Hong Kong - surpassed \$17 billion dollars in 2008. Demand for mushrooms, especially tropical varieties such as *shiitake*, *maietake*, and *ganoderma* has enjoyed double digit growth for decades. Driven by consumer preference for cholesterol- and saturated fatty acid free food, it is expected that the average per person consumption of 175 grams of tropical fungi in the US and Europe will increase to 500 grams within a decade. This will create an additional \$2.3 billion in sales. If the West would eat as much fungi as Hong Kong (17 kg per year per person), then we are looking at a staggering \$120 billion in trade. Tropical fungi would outpace coffee and metals as a world commodity within a generation. The Americans would dramatically improve their diet.



The Innovation

Farming mushrooms requires bacterial control at high energy cost. However, either through fermentation on the farm, to peel the husks off beans, or through the exposure of ground beans to hot water when brewing a cup, bacteria are reduced to a minimum permitting the mushrooms to digest fibers. Thus farming mushrooms on coffee is 80 percent more energy efficient than a stand-alone energy intensive process preparing substrates for fungi farming.

Quality tropical mushrooms are farmed on hardwoods like oak. Hardwood trees are harvested, ground and converted into artificial logs. It takes up to 9 months to fruit *shiitake* or *ganoderma*. Prunings, husks, pulp and grounds are by-products from coffee which is also a type of hardwood enriched with caffeine. While cows or pigs don't respond well to caffeine, this biochemical stimulates the growth of mycelium to such an extent that mushrooms pop out as quickly as 3 months after seeding. This generates better cash flow and offers a competitive alternative to the traditional mushroom farming techniques .

The third innovation is that the leftovers after harvesting mushrooms are enriched with essential amino acids, including lysine, a highly prized enzyme traditionally derived from sugar beets. Thus a by-product without value is converted into quality animal feed for farm cattle or for pets at home. Professor Ivanka Milenkovic, (University of Belgrade, Serbia) has provided scientific proof that underpins the financial logic of cascading nutrients and energy from agricultural waste to fungi to animal food.

The First Cash Flow

Carmenza Jaramillo, a Latino entrepreneur and Ivanka Milenkovic demonstrated this business model by creating their own commercial mushroom farms. The strategy of taking coffee waste and converting methane producing biomass into revenue generating fungi proved to be a viable model. After more than a decade tropical mushrooms have created new markets from Colombia to Serbia. It is no surprise that in 2009 over 100 companies adopted this business model in the Colombian coffee growing region El Huila. Anyone with access to biomass rich in either caffeine or hardwood fibers, now has the opportunity to start seeding mushrooms competitively. This generates jobs, provides food security and creates revenues while reducing the demand for hardwood trees and eliminating the need for increased logging due to rising mushroom consumption by vegetarians and gourmets alike.

The second opportunity to generate your first cash flow is the creation of a business whereby cafés and restaurants that today pay to dispose of coffee waste, could pay a symbolic fee to entrepreneurs who convert this waste to farm delicious mushrooms for sale to local restaurants. The real opportunity is the design of a business model based on the "branding of waste". Indeed, "waste" has always had negative connotations and no company has wanted its name associated with a specific waste stream that causes harm or is perceived as a nuisance. This is different now.



The Opportunity

Waste is not wasted. Waste generates quality food at lower cost, eliminating the need for transportation, offering fresh produce locally, while reducing the burden on landfills. Well-known cafés like Les Deux Magots in Paris or DoutorCoffee in Tokyo may be delighted to have their reputation for quality extended to the quality of mushrooms farmed on their waste while generating jobs. If fair trade and organically grown coffees like Max Havelaar were the base material, imagine the added value that could be generated for all partners. Entrepreneurs would enjoy a low barrier to entry since inner-city restaurants and cafes would even pay for disposing of the raw material and pay to offer these delicacies on their menu.

The California-based coffee wholesaler Equator headed by Helen Russell takes this to the next level. Helen and her team created a special mixture of beans named Chido's Blend, named after Chido Govero, the young Zimbabwean orphan who trains women on coffee farms to produce mushrooms on coffee waste, providing food security and jobs while reducing abuse and helping contain the spread of AIDS.

At the same time Equator clients offer their waste in the San Francisco Bay Area will end up with BTTR Ventures, a start-up company created by Nikhil Arora and Alex Velez, two Berkeley University business graduates. Nikhil and Alex are the first to create a brand around mushrooms farmed on coffee waste. It is not a surprise that they were selected by Newsweek as one of their 25 entrepreneurs of the year under 25 in 2009. Helen Russell now generates more business for herself, more cash for Chido, and facilitates growth for Nikhil and Alex while coffee waste gets a brand.

This new business model could proliferate from coffee shops in Istanbul and Cairo to coffee farms in Hawaii, Indonesia, Cameroon and Jamaica. Tea farms from Kenya and India and apple orchards from South Africa or Chile struggling to compete can enjoy opportunities for their biomass waste similar to the one described for coffee. They have one thing in common - the need for entrepreneurs to take up the challenge.

To pre-order the book *The Blue Economy: 100 innovations - 10 years - 100 million jobs*, please go to <http://www.paradigm-pubs.com/catalog/detail/BluEco>. You will receive a 10% discount if you order before April 1, 2010 and key in the promotional code: TBE4110.

For further background on the 100 cases: www.blueeconomy.de



Chido Govero, Zimbabwe



Ivanka Milenkovic, Serbia



Carmenza Jaramillo, Colombia

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Coffee beans



Shiitake on Coffee



Spent Substrate on Pig feed

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Chido, Nikhil Arora and Alex Jaramillo sharing with Marin City (California) citizens how to convert spent coffee beans into mushroom substrates.
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