Case 3

Coffee : Export Crop Provides Food Security

*convert methane to CO₂, secure food, generate 50 million jobs on farms and inner-city*

This article introduces the coffee farming as one of the 100 innovations that shape The Blue Economy, which is known as ZERI’s philosophy in action. This article is of part of a broad effort by the author and the designer of the Blue Economy to stimulate open source entrepreneurship, competitiveness and employment. For more information about the origin of ZERI <www.zeri.org>

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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 harvesting, processing, roasting and brewing coffee discards an estimated 99.7 percent of the biomass. 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, contributing the 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 and has continued growing ever since. Demand for mushrooms, especially tropical varieties that listen to names like *shiiitake, maietake, and ganoderma* have 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 is good for an additional $2.3 billion in sales. If the West would eat as much fungi as Hong Kong (17 kg per year), then we are looking at a staggering $120 billion. Tropical fungi would outpace coffee 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 peal husks off beans, or through 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 can be clustered with free energy needed to prepare coffee.

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, also a hardwood enriched with caffeine. While cows or pigs get stressed out by caffeine, this biochemical stimulates mycelium to the point that mushrooms pop out already 3 months after seeding. This generates a better cash flow and offers a competitive alternative to the traditional techniques.

The third innovation is that the left-overs 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 a quality animal feed for cattle on the farm or pets at home. Professor Ivanka Milenkovic, (University of Belgrade, Serbia published by Elsevier Science) provided scientific proof that underpins the financial logic of cascading nutrients and energy from agricultural waste to fungi and then to animal food.

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

The second opportunity to generate a 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 the local restaurants. The real opportunity is the design of a business model based on the “branding of waste”. Indeed, the brand “waste” has always been negative, and no company would like to associate its name 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 transportation, offering fresh produce locally, while reducing the load on the landfill. Cafes and restaurants may be delighted to have their image extended to the quality of
the 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 on the farms or in the coffee shops. The
entrepreneur enjoys a low barrier to entry since inner-city restaurants and cafes pay for
disposing of the raw materials and pay to put these delicacies on their menu as is done
by La Place in the Netherlands thanks to the initiative of Jan-Willem Bosman Jansen of
the start-up company GRO.

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
around coffee farms to produce mushrooms on coffee waste, providing food security
and jobs. This reduces abuse and helps contain the spread of AIDS. Chido is using the
funds to train orphans food security and when they have their food, then abuse is not
tolerated. The business model is designed to contribute to the personal and
professional development of the unreached in Africa.

At the same time Equator clients like Peet’s Coffee offers their waste in the San
Francisco Bay Area to BTTR Ventures, the start-up company created by Nikhil Arora
and Alex Velez, two Berkeley University Haas School of Business graduates. Nikhil and
Alex were the first ones in the United States to put a brand on mushrooms farmed on
coffee waste. It is not a surprise that they were selected by Newsweek as one of the 25
entrepreneurs of the year under 25 in 2009. They went on to become the runner-up in
the BBC World Challenge the next year. 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 which command an additional revenue stream.

This new business model proliferates from Amsterdam, Paris, Seoul, Mexico, Sydney
and Berlin with an estimated 15 inner-city initiatives unfolding worldwide in 2012. The
farm projects have expanded from Latin America to Africa and Asia, with Chido Govero
committed to make a difference. Now if this works with coffee, then we can expand to
other agricultural wastes like tea in Kenya and India, apple orchards in South Africa or
Chile where companies struggle to compete in this globalized market focusing on
cutting costs and labor productivity only. The scanning and screening of the Blue
Economy team identified in South Africa no less than eight additional cash flows, while
having the chance to double the number of jobs. All these projects and initiatives have
one point in common: the need for entrepreneurs to take up the challenge to use and
give value to what is locally available.

Gunter Pauli is the author of the Report to the Club of Rome:
“Blue Economy: 100 Innovations - 10 years - 100 million jobs” published in 35 languages worldwide.

For further background on the 100 cases: www.TheBlueEconomy.org

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