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A Future for Buckwheat in the Himalayas

This article introduces innovations in high altitude agriculture 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 World Market for Buckwheat

The world market for buckwheat in 2010 reached an estimated \$400 million. The total production reached only 1.5 million tons, only half of the world's output a decade earlier. While weather conditions in Russia, the second largest producer after China have greatly influenced output and pushed prices to the consumers from one to three dollars per kilogram, land owners have increasingly been producing under contract farming for large corporations which offer predictability in revenues. The top five producers combined (China, Russia, Ukraine, Poland and USA) represent over 80 percent, and China's output represent 39 percent of the total. China is not only the world's leading producer, it also pioneers innovations with over 100 full time researchers from 66 institutions focusing on the increase of yields which have improved 70 percent over the past three decades.

Buckwheat has been farmed in the central Asian highlands for at least 5,000 years. The gluten free grain was introduced to Europe approximately one thousand years ago, and entered North America in the end of the 19th century. It provided food security in the Himalayas for generations with two main varieties: the common buckwheat that yields 750 kilograms (kg) per hectare, and bitter buckwheat that produces 1,600 kg per hectare. Buckwheat can be farmed at altitudes as high as 4,400 meters and the period between sowing to harvest is only 30 days. Buckwheat in Japan moves from seed to a soba noodle ready for consumption in only 75 days. Buckwheat grows so fast it crowds out most weeds. It can be farmed on poor soil, needs no pesticide or fertilizer and is an ideal crop to prepare the land for organic farming. The main use of buckwheat in the world is for pancakes (Europe and North America) and soba noodles (Japan). However in the Himalayas, 70 percent of buckwheat responds to local needs.



The Innovation

Buckwheat is one of the most efficient producers of plant protein, unmatched by any other grain (even though it is classified as a fruit due to its pyramidal shape). The human body can digest 74 percent of buckwheat's protein content which includes 8 essential amino acids, Vitamin E and nearly the entire spectrum of B-complex which helps the body to respond to insulin needs. Honey from buckwheat flowers has up to 20 times more anti-oxidants than any other honey, offering a prime quality by-product. The hulls are used as packaging material, as base material for heating pads, as raw material for mattresses, and as the filler for hypo-allergenic pillows that offer excellent neck support. However, advertising has shifted the image of buckwheat and the local population increasingly prefers imported white rice,. This shift in consumer preferences risks putting buckwheat into oblivion in spite of the ease of farming and the health benefits of buckwheat, with its undisputed capacity of replenishing top soil. In Europe and North America the flower has only increased popularity amongst people suffering from diabetes. Buckwheat, an integral part of the Himalayan culture and tradition, now risks its elimination. This would not only represent a loss of revenue for the farmers who cannot compete with the mass produced grains at subsidized rates, it would imply a fundamental shift in society.

Kinley Tshering studied forestry at the University of Montana, in Missoula (USA). Born in Bhutan, and interested in preserving his country's tradition, especially its economy and ecosystems based on native forest motivated him to obtain a degree in forest management. However, while he was living in Montana, he also learned how to brew beer. Originally, he was attracted to the concept of the Blue Economy in his role as the chief forester of Bhutan. After participating in the meetings he was exposed to the opportunity to rethink beer brewing, based on buckwheat. When he learned of the business model described by Mr. Sy Chen, the Japanese branding and marketing expert, he realized that while buckwheat from Bhutan could not compete on international markets it would be an ideal basis for the creation of a unique organic non-alcoholic buckwheat beer. As Sy explains, nonalcoholic beer represents the highest growth segment of drinks in Japan. The business model is not to produce beer in Bhutan from buckwheat and ship it to Japan: the innovation in the concept proposed by Sy is to license the brand and supply the key ingredients. The first assessment indicates that the earnings from royalties on the sales of beer could generate more income than the export of buckwheat.

The First Cash Flow

Sy and his team at Creative Intelligence Associates in Japan developed the PAWO brand. The trademark has been registered in Japan and is owned by the Bhutanese Ministry of Agriculture and Forestry. Jim Lueders from the Wildwood Brewery in Stephenville, Montana, just 20 miles from where Kinley studied, is prepared to make the first brews starting from a buckwheat malt extract. If buckwheat were exported, and



used for beer brewing, then only starch would be valued. The rest would end up as cheap animal feed. However, if the Bhutanese first make a malt extract, then the 92 percent left-over can be used as local animal feed substituting the expensive and low quality imported feed from India which is mainly derived from agricultural waste and left-overs from the fish processing industries. Each ton of buckwheat would then provide 900 kg of animal feed. Since buckwheat has a moisture level of only 14 percent, and spent grain from after the malt extraction has 50 percent humidity, it represents a high quality local feed that requires little or no transportation, a win-win for farmers and beer brewers. A typical and yet competitive Blue Economy model emerges. Kinley and his team is now committed to produce a local beer, in a local brewery with the technical support of Jim Lueders securing that there is local expertise, and a reference on the local market that projects the right image to the international market, and at the same time fulfills the needs on a local market. With an investment of approximately \$600,000 the brewery can be operational by 2013.

The Opportunity

The first contacts in Japan confirm that the licensing model is viable. However, there is demand for more than only a brand name and malt extract from Bhutan. The brewing of beer according to the purity principles of 16th century Germany prescribe that only water, barley, and hops be used. While the original text omitted the mentioning of yeast, which was only discovered by Louis Pasteur more than three centuries later, beer can only be fermented if the right type of yeast is added, or attracted. Bhutan is rich in wild yeasts, which can be harvested along the same ways as several of the traditional beers in Belgium still do today.

This means that the exclusive Bhutanese beer license could now generate revenues from (1) the licensing fee calculated on beer sold, (2) the sale of malt extract, (3) the sale of the spent grain from the extraction process as animal feed, (4) the sale of beer on the local market, and (5) the sale of wild yeast. The generation of alcohol is unavoidable when brewing beer. Alcohol-free beer needs to remove the alcohol. So in this case, one could even generate an additional income stream - alcohol. In the future Bhutan could even supply its own hops, securing half a dozen income streams that render buckwheat in the Himalayas insensitive to the world market prices for this commodity.

The organic farming program of the Bhutanese Department of Agriculture will permit the recovery of organic buckwheat as part of an initiative to accelerate Bhutan's socio-economic development. An uncompetitive buckwheat that could not meet world market prices farmed at over 3,000 meters altitude, contains a wealth of tradition, culture and nutrients, now turns into an engine for rural development. Better even, it permits the preservation of a millennium old Himalayan culture, and the rural communities, while reducing shipment and transport to the absolute minimum and still pursuing the



advantages of a global community. The Blue Economy is not against globalization, it is in favor of the capacity to respond to local needs, build social capital and ensure quality of life. The solution imagined for Bhutan is not the exception, it is part of a broader initiative to grow the economy with available resources shifting from the blind economies of scale and the myopic view that all that matters are low commodity prices and low wages while transportation and marketing is responsible for up to 90 percent of the value added generated in the process from farm or mine to the end product. This 90 percent could remain in the local community and stimulate growth in a non-inflationary manner. The missing link to success are the entrepreneurs who see the opportunities and are prepared to harvest the six cash flows that characterize citrus fruits in Southern Africa, apples in Chile, or vegetables in Australia.

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.

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