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## **Brewing & Food Processing Projects**

### **Heritage Brewing, California**

In 1994 I helped the founders of Heritage Brewing in Lake Elsinore, California to commission their new brewery as a way to learn about building a brewery and making great beer. I am grateful to Mark and John for the opportunity and very indebted to their brewer Mike Ramsay who knows pretty much everything that's worth knowing about making beer.

### **Zikomo Brewing, Zambia**

I returned to Zambia and built Zikomo Brewing from scratch. In hindsight I should have borrowed more and got into production sooner but hindsight is always 20/20 and I learned a lot doing it myself. Plus I met my lovely wife who enjoyed my Baobab White (a Belgian Wit with Baobab fruit and coriander and a favourite of the current President of Zambia, Michael Sata!)

### **Maheu Plants and others, Zambia**

In 1999 I helped to improve a large factory producing a traditional fermented maize (corn) based food drink called maheu. I went on to design and build three more maheu factories including possibly the biggest in Africa, the Trade Kings plant which was later bought by SAB/Miller for \$20 million.

I also built a dairy processing plant for Zambeef/Zammilk and did some process tanks and process piping for honey, fruit juices and potato chips.

### **Fresh Start, Sri Lanka**

After the tsunami in Sri Lanka, I worked with Women in Need and Swisscontact to help set up a cooperative food production business for widows and abused women.

# Opening

# Zambia's

## First Microbrewery—

## *Zikomo Brewing Company Ltd.*

It might not be everyone's first choice for a new venture, but one brewer has found success in an unlikely corner of the world.

By Derek White

**T**he first question I'm usually asked is, "Why a brewery?" The short answer is, "I like beer!" The longer answer is, "I needed a job, beer seems quite profitable, the economy was liberalized here in Zambia, brewing is a nice mix of art and science, and I like beer!" Now, after over two years of building, thousands of hours of cutting, welding, grinding, polishing, frequent flooding, occasional riots—and even a coup—Zikomo Brewing is starting to brew.

Perhaps like many of you, I drank a lot of beer before I was ever really interested in the product. From my late teens through my years at university, large quantities of

bland, boring, mass-produced beer passed through me without really doing much but get me drunk and give me hangovers. My real interest in beer came years later when I visited my first brewpub. It was an Irish pub in the Latin quarter of Paris, and they brewed some really interesting beers in some beaten-up old copper tanks. The brewer explained the process to me and gave me several samples to taste. I was hooked.

My new-found passion for beer grew while working in Brussels. Belgium is several times smaller than Zambia, yet this diminutive country has over 450 different local beers, a great many of which are

brewed in small breweries using very old traditions and equipment. While back in the United States studying for my masters degree in international business, I witnessed the craft brewing revolution occurring there and spent many hours "researching" different beers and different breweries. Over the course of almost three years I visited breweries and brewery manufacturers, conducted extensive research in the UC Davis [University of California in Davis, Calif.] brewing library and attended several conferences and trade shows. I decided I wanted to start my own small brewery in Zambia, and once I had made that decision I found a job working for Heritage Brewing, a new microbrewery in Southern California. The brewers, Mark Mericle and Mike Ramsay, were very helpful and shared their years of training and experience with me.

The sense of camaraderie among small brewers in the U.S. and their passion for their products has been a source of inspiration and enthusiasm for me. Through the various organizations and publications, I have literally hundreds of fellow brewers only a phone call or an e-mail away. Here in Zambia, I am the first microbrewery in the country, and the two big breweries that exist are owned by South African Breweries (SAB) and Nile Breweries of Uganda (who are themselves part-owned by SAB). I have benefited from a lot of advice and help from some fellow brewers at the big breweries, but have received



**Pulling a pint of Zikomo ale at a Zambian pub. Currently available only on draught in local pubs, Zikomo is moving to bottling and plans to broaden its distribution.**





**Zikomo Brewing Co. founder Derek White, left, poses with his team of fabricators and brewers to celebrate the completion of the brewery, which White and crew built from scratch.**

mostly antagonism from the rest of the big brewery management. SAB is the biggest brewer here in Africa and they seem to prefer a monopoly wherever they go—anti-trust laws have a long way to go in this part of the world.

### Getting it Done

At the beginning of 1995 I registered my company and acquired an investment license. This entitled me to various incentives, such as duty-free import of all plant equipment, up to five work permits for foreign employees (which I haven't used), and two year depreciation of the plant. I found a building well-suited for a small brewery, and towards the end of 1995 I imported all of the stainless steel sheets, welding and fabrication equipment, pumps, pipes, etc., I thought I would need.

It then took me, two trained welders and about ten young "school-leavers" over two years to build a 70-hl (60-bbl) brewhouse,

with three 140-hl (119-bbl) fermenters and two 30-hl (25.5-bbl) fermenters, a refrigeration system, a coldroom, and machines for washing and filling kegs. We even built the insulated body for our delivery van so we could deliver our product properly chilled.

It sounds straight forward enough, but I haven't talked about the struggle to find the financing, being ripped off by some unscrupulous suppliers, and containers getting lost in ports. I had chosen the cheapest shipping quote but I ended up spending days on the phone and fax (at \$5 U.S. per minute) tracking down containers and paying all sorts of hidden fees. Now I only use well known companies and let them bring it all the way to my doorstep.

Given that most of you reading this have had some formal training and many years of experience in brewing, I am not going to dwell on the technical aspects of the brewery. Our brewery is unlike any other brewery in the world. I have borrowed (or stolen)

ideas from so many breweries and have even had some pretty good ideas of my own. The combination of my engineering background and my lack of formal training in brewing meant I was not constrained by what plant was already available or by an over-developed sense of tradition. While a German master brewer will swear by decoction brewing and a British "real ale" brewer will insist on cask conditioning, I simply wanted a system that was easy to build, simple to operate, and made great beer.

An interesting observation was shared with me when I started looking into building a brewery. Everyone usually wants things to be done cheap, fast, and right. The catch is that you can only realistically have two of these so you have to choose. If your market "window of opportunity" is changing fast and you need to move quickly, expect to pay up or put up with equipment that isn't right. If you have limited capital but want to do things right, it is going to take time. If I could



do this again I would have tried to borrow more money to get up and brewing faster.

The market has changed dramatically since I started building. There is more choice and higher quality beers than before, so some of my competitive advantage has been lost. I would also have planned to bottle my beers from the outset instead of waiting to see how the draft beer sells. Bottles can go anywhere but draft beer requires electricity, glasses (not commonly used here), and an honest barman (for accountability). Meeting all three of these requirements is not easy for most Zambian drinking establishments.

### The Beers

We are brewing all-malt lagers and ales using German and English speciality malts and a mix of American, English, German, Czech and Slovenian hops. There are no decent specialty malts or hops available in this region so it has to be imported at great expense and often faces long delays. I have to order and pay for a container full of malt at least three months before I need it.

We distribute our beers in stainless steel kegs to some of the top hotels, restaurants, bars and clubs in Lusaka, Zambia's capital. Our first two beers were "Dr. Livingstone's Lager" and "Zikomo Copper Ale," and we have just started market testing a dry stout ("Safari Stout") and a wheat beer. We are always trying out interesting recipes and have done a few experimental batches using local African fruit like baobab and murula. A Belgian "white" beer with baobab fruit and some other local berries is tasting very promising.

### Challenges

Everyone will tell you that starting your own business is not easy. The truth is that even with warnings most entrepreneurs (myself

included) underestimate how hard it will be. Starting a new business in a developing country is even harder and I would strongly warn against it unless, like me, you have a lot of knowledge and experience of the local market and also good contacts within the country. With craft brewing reaching saturation levels in many developed countries, the temptation is there to move into developing countries. There are certainly opportunities to enjoy "first mover" advantages and establish profitable niche markets. But there will also be many obstacles you would never know about unless you have a lot of country-specific knowledge or a partner with that knowledge and some good contacts.

A simple example is licensing. Every country has its own myriad of licensing laws and no one person can tell you all of them. You could waste months and go bankrupt becoming familiar with the maze of dark corridors and layers of red tape involved with all of the licenses required. I had five fire inspections, four environmental inspections, four health inspections, two labor safety inspections and six building inspections before I realized the word was out that free beer samples were to be had! When the free beer dried up, suddenly people became less cooperative and the licenses which were "about to be issued" were lost, withdrawn or were being re-evaluated by someone's superior.

Some of this is sheer incompetence, but a lot of it is simply the way underpaid civil servants supplement their income. There are usually a few people who are not corrupt and can make things happen. If you can find them, good luck to you! If you can't, you either have to know someone or pay up.

Knowing someone helps a lot, and although it isn't usually free, things happen fast. Paying a "backhand" is problematic because the word gets out and soon every tiny little step will be blocked by someone wanting their cut. To save time and money, go to the top and make it clear that nothing will be given until the licenses are in your hands. When I hit that "wall" I spoke to a friend. Things happened fast, and now the only delays I have with licensing are due to genuine incompetence. That's where patience comes in.

If you are used to an efficient, fast-paced business environment or don't have a lot of patience, you will have to change. If you don't, you will either throw in the towel

or the stress will kill you. In a new or difficult environment, patience and flexibility are key to your long-term profitability and sanity. Remember that "planning is everything, but the plan is nothing." A plan is made at the beginning when you know the least, so don't carve your plan in stone. Planning is essential to have a good understanding of where you are and where you would like to go, but your plan should be a dynamic, living thing. You are already going to have more than

enough country-specific constraints and challenges so don't be further constrained by your own pre-conceptions—which may well be wrong.

### Getting Materials

In addition to the usual problems (like undercapitalization), a new business in a developing country has to deal with poor to non-existent infrastructure and suppliers, as well as instability in the economy and the currency. We store enough water for a week's brewing and have a generator for power cuts. The road to our brewery is a lake during the rainy season. Our coldroom and glycol system have two condensers each since replacements are not readily available. Many things that you take for granted in a developed country—security, transport and communications, access to raw materials—are wishful thinking in a developing country. We have had two burglaries and lost a lot of equipment, but now our security system is more sophisticated than our PLC controlled keg washer. The friend who helped us bypass the two-year waiting list for a telephone insisted that we get three lines so that we would usually have at least one working. I still need a cellular phone for the periods when all three lines are down.

I have honestly spent more time at the border, at the airport and at customs than I have spent brewing beer. Everything from all my malt, hops and yeast to the smallest little bolt has to be imported. A very successful Californian brewer once said that he would rather burn down his brewery



**A welder puts to work on one of the cylindro-conical fermenters.**



**Zikomo constructed all their own equipment, including this keg washing machine.**

than use pelletized hops. I'm glad he has the luxury of local hop growers, hop merchants and the infrastructure to store and transport leaf hops or I might never have enjoyed his wonderful ales!

Once you have sorted out your plant, your raw materials and your red tape, there are still lots of other things that could go wrong in a developing country. Your personal health and safety can no longer be taken for granted. Zambia is a fairly peaceful country, and I have only had to use my pepper spray once in three years. There are many developing countries where armed robbery, burglary, and car-jacking are common, and the local Mafia will be very interested in any profitable venture. While you are not as likely to get sick from the food or the water here, I have had malaria twice this year. I also have to have medical evacuation insurance because most specialist medical care is not available here.

### Accommodating Change

Since I started writing this article, the Zambian currency (the kwacha) has lost over 20 percent of its value and the economy has really taken a turn for the worse. The reasons behind this are mostly political, but whatever lies behind this devaluation it is now costing me that much more to import raw materials and service my U.S. dollar loan. I can't pass this straight on to the consumers because our beers are already fairly expensive and consumer's salaries will take some time to adjust. Between these currency "hiccups" and the frequent, seemingly random changes to the tax and tariff structures, it is very hard to forecast with any accuracy.

If you come from a different country or culture than where you have set up your business, you must continuously challenge your assumptions and get feedback and ideas from locals every step of the way. All of my employees (some of them with university and other higher education) believe that "Ilomba" exist. It would be naive of me to reject out of hand the existence of this snake with a man's head just because I've never seen one. When they said a hefeweizen wheat beer would never sell here because of the cloudiness, I asked more questions, did some market testing and decided to brew a clear "Kristel" weizen instead. After 30 years of frequently cloudy, "bad" beers from the two big breweries here, a hefeweizen would be a hard sell. Many people here still, out of habit, hold a bottle of beer up to a light before drinking it.

As well as needing patience and flexibility, it helps if you are passionate about what you are doing. Any occupation has tasks that will range from the mundane to the life-changing. If you have a few things that you enjoy doing and can really get excited about, that will help you get through the rest of the BS and hopefully be reflected in your management style and your products. After being

driven up the wall by a culture with a lack of attention to detail, I can't stay angry for long because of the warmth and sense of humor that the people here display.

Although very challenging at times, I have really enjoyed the creative, technical, and management aspects of building everything myself with people who have never done anything like this before—in a country where it has never been done before. The sense of achievement with each success along the way has helped keep up my enthusiasm. I believe that my passion for the product (really great beers) is infectious. All of my employees,

most of my friends, and more and more of my customers, are getting excited about my beers. After a difficult day of tearing what's left of my hair out, it only takes a few sips (or a few bottles on a really, really bad day) or perhaps a compliment from a stranger to remind me why I got into this business.

Life is Short, Drink Real Beer!

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## Question & Answer with Derek White

**Why Zambia? What's your connection to the country and why did you decide to build your business there?**

DW: I was born in Zambia, in the Copperbelt. My parents are from South Africa and Mozambique, and both came to Zambia to work and have never left. After I received my masters in international business in the U.S. at the University of South Carolina, I was looking for a job in the U.S., but it was tough with no green card, so I started looking into starting my own business. Brewing had just been liberalized in Zambia (before 1991 only the government could brew beer) and I was already a beer enthusiast, having visited breweries in the U.S. and Europe, so the plan began to take shape.

**When did you finally begin brewing your finished product?**

DW: During the construction we brewed over 60 recipes in a small pilot system as a way of training my brewers and to reach our first two brand recipes. Our first batches in the commercial system were brewed in December 1997.

**What is your annual capacity?**

DW: With present fermentation capacity, 7,800-hl (6,647-bbl) a year. Our brewhouse could do four brews a day of 70-hl (60-bbl) each, so with more fermenters we could reach a maximum of about 90,000-hl (76,698-bbl) a year.

**Where do you get your water and do you have to have to employ any special filtering equipment for your water?**

DW: We are supplied a mix of Kafue River water and Lusaka borehole water (very hard) from the local water company. It is already treated and potable. It's good for ales, a little hard for light lagers (which we don't do). We run it through a few cartridge filters and then an activated carbon filter.

**What is your system? A basic infusion mash?**

DW: We mash into the kettle, where we can do a stepped infusion (any temp profile we want), then we transfer to a "strainmaster" style lauter tun, which also has a false bottom in the swing door for extra runoff area. We circulate, runoff back to the kettle for boil, whirlpool in the kettle (mixer blades lie flat for whirlpool). We use a usual plate-and-frame heat exchanger, we have a hot liquor tank, a cold liquor tank to cool the wort, and sterile air and yeast are injected in-line after the heat exchanger.

**Do you have to pasteurize?**

DW: We sterile filter prior to bottling or kegging.

**Where and to whom is your beer selling best?**

DW: Initially we only supplied top hotels, restaurants, bars, and nightclubs around Lusaka. Recently we started supplying beer to a few nightclubs in the Copperbelt. We'll be bottling by August, so our beer will be more widely available then. Middle-class Zambians (very fashion and "class" conscious—they want to look rich and important drinking expensive beer) account for 60 percent of our sales. Upper-class Zambians and expatriates who have grown to prefer more flavorful beers while in Europe or the U.S. are the other 40 percent of our sales.

**What is the long-term projection? Is there an emerging market for crafted beers in Zambia?**

DW: We are growing slowly, and this will speed up once we start bottling. I have a shortage of dispensing equipment (I turn down potential customers almost daily) but will be getting more soon. I think there is opportunity for many brewpubs, and I have quoted on building two pub systems in the last year.





## Maheu taking off in Zambia

**Production of the maize-based non-alcoholic food-drink maheu (mageu in SA and mahewu in Malawi) has taken off in Zambia.**

Two producers are already on the market and another three or four plants will soon be commissioned.

Commercial production of maheu, a traditional drink in Zambia, was started by Liquified Foods in Lusaka. The Chanda brothers of Central Breweries in Lusaka, a leading opaque brewer, secured a \$600,000 loan from the Southern African Enterprise Development Fund to undertake commercial production of maheu after seeing its success in SA and Malawi. After many delays, the plant finally began producing in March 1999. Following initial hesitation, demand for "Premier Maheu" took off and has continued to grow ever since.

Retail prices for Premier Maheu edged up as demand continued to outstrip supply. Today a 500ml carton sells in Lusaka for K800 (\$0.28). Wholesale prices are K500 for 500ml cartons (which account for most sales) and K300 for 500ml sachets. The most popular flavour is strawberry, followed by natural and banana.

Exact figures are not available, but Christopher Chanda confirms that Central's production is well over 40,000 litres per day.

### SA Breweries

About a year later, National Breweries, an opaque beer brewer owned by SA Breweries, launched its "Moka Maheu" in 250ml sachets. The key difference is that Moka does not undergo lactic fermentation; instead, lactic acid is used to impart sourness. This simplifies the process and substantially reduces the number of tanks required, but produces a different-tasting product.

The market has not accepted Moka. This may be because of its taste, although a source at National Breweries blamed it on its packaging - plastic sachets. Sales may increase once Moka cartons are on the market.

### The biggest

The biggest maheu plant in Zambia - Trade Kings' "Super Maheu No



*Winani Chiwowa, head brewer of Trade Kings, in its maheu plant while under construction.*



*Some of the maheu products currently on the Zambian market.*

1" plant - will be commissioned in Lusaka in August. It will have an initial capacity of 150,000 litres per day, and space for expansion. The three initial flavours - natural, strawberry and banana - will be packed in 500ml gable-top cartons and several sizes of plastic bottles. Trade Kings' managing director, Mohamed Khalid, says: "We are starting with the cartons which have already been accepted by the market. We will soon follow with plastic bottles, which are much lower-cost."

The Trade Kings plant uses regenerative heating and cooling to save energy. Overall plant costs have been kept down by sourcing used stainless steel tanks from SA and the rest of the plant from the US, Europe and the Far East. Derek White of Zikomo Brewing, who is building the plant, says: "Years of little or no competition in the SA market mean that even after paying expensive airfreight costs, it is cheaper to bring in pumps, fittings and heat exchangers from overseas. Often the prices quoted by SA suppliers include SA duties which Zambian customers should not have to pay. SA-made products are also often priced to compete with heavily-tariffed imports."

### Other plants

A fourth maheu plant being built in Lusaka, with an initial capacity of about 10,000 litres per day, is that of High Protein Foods (HPF). Its brand is "High-Pro Munkoyo" (munkoyo is another traditional name for maheu). HPF recently started test-packaging, in cartons, its product in natural, orange and mango flavours. HPF uses a lactic fermentation process and real fruit, soy flour and vitamins, with maize and wheat. This gives a more nutritious product with a smoother texture. It is too early to tell the market's response.

Two other smaller maheu plants are being built by White. He would not give details of the one plant; the other is being built in Ndola for Carribea Beverages, a fruit juice packaging and distribution company. Its turnkey system will have an initial capacity of 15,000 litres per day, with expansion to 60,000 litres per day possible with additional fermentation tanks.

Carribea Beverages is planning to use its existing plastic bottle filling line for both juices and maheu.

This is the first maheu plant in the Copperbelt, a region which should see some economic growth following the privatisation of Zambia's copper mines.

Says White: "Many parts of the country are still not supplied with packaged maheu. There are opportunities for small plants in most towns. There is also the bulk market - for instance, industrial and relief feeding - which has not yet been touched and which has proven to be quite large in some of Zambia's neighbouring countries.

"The long shelf life of the product - eight weeks or more - makes it relatively easy to distribute and less of a liability for retailers in rural areas.

"The success of maheu in Zambia is understandable. With real incomes having fallen dramatically in the past few years due to corruption and mismanagement of the economy, people are looking for low-cost nutrition. Apart from being a refreshing drink, maheu has significant food value and is relatively inexpensive."

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