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Waste not want not, the Namibian way

A Namibian Sorghum Brewery in Tsumeb, was looking to carve its niche in the market. It needed to develop a system that would help reduce cost and increase profit margins. They thought that a slogan that said "good beer, no chemicals, no pollution, more sales and more jobs" could be it.

They consulted a septogenarian scientist, Prof George Chan, and gave him the challenge of designing a system to brew beer and generate no waste.

Using the principles of nature: Whatever is waste for one, is food for someone else, Prof Chan worked with a group of scientists supported by the United Nations University to address issues such as how to make best use of the spent grain, the alkaline waste water, and the CO₂ gases that make up 98 per cent of the waste from the brewery.

The system developed was carefully tailored around a system which

reuses all waste into valuable products. The result: a zero waste Namibian Sorghum Brewery in Tsumeb, was opened and inaugurated on January 31, 1997 by HE President, Sam Nujoma. The first issue tackled was the spent grain. Previously the spent grain was traditionally given away to farmers; however, it is well known that cattle cannot digest the fibres.

Broken down

The lignin-cellulosic component, which is 70 to 80 per cent of the spent grain, can only be broken down by the enzymes of mushrooms. Prof Chan collaborated with Dr S T Chang from the Chinese University of Hong Kong and he trained the Namibian workers in the cultivation of this high priced product, which is traditionally imported. Four tonnes of spent grain is sufficient to grow one tonne of mushrooms. And with four tonnes of waste a day, the brewery has converted into a major mushroom producer.

The spent grain is also full of pro-

tein, up to 26 per cent. If too much protein ends up in the beer, then it would make the drinker gain too much weight. Wasting protein is unacceptable, definitely in Africa.

In cooperation with the Namibian University's Faculty of Agriculture and Natural Resources, the brewery cultivates earthworms and these are used as chicken feed.

Drop of water

The second waste tackled was water. Approximately 80 per cent of the water used in the brewing of beer does not end up in the bottle or the can. Initially, Namibia Breweries had secured a license to extract water from an aquifer, and would only use 20 per cent commercially, thus Mr Chan designed a system that does ensure that no drop of water is lost. The waste water is alkaline and could be used for the cultivation of spirulina and algae. Just imagine, this algae generate up to 70 per cent protein, exactly what is needed locally to fight child malnutrition. The brewery is not wasting

protein any more; it has become a protein factory. The residual water is then channelled to fish ponds where the traditional multi-cropping fish farming has been introduced, as applied in China and Vietnam. Now, Namibia has abundant water for fish farming and all the feed is provided from the waste streams generated by the earthworm/chicken/mushroom cycle. With a productivity of 15 tonnes per hectare per year, the brewery has also become a fish factory.

Can this Zero Emissions industrial design concept be used in Kenya and other nations within the continent? Invest a little time to learn how to turn the waste from your business into a resource. I assure you it will be time well spent. I also guarantee that you will always find a way to boost your bottom line and increase profits if you look to reduce, recycle and reuse.

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