

Conversation #6

How Technology Makes Farming Sexy Again

Su Kahumbu Stephanou of Green Dreams Tech Ltd.



*Social entrepreneur **Su Kahumbu Stephanou** is a passionate organic farmer and the founder and Chief executive officer (CEO) of Green Dreams Ltd. and Green Dreams Tech Ltd. She is a pioneer in the organic industry in Kenya, working with smallholder farmers for more than 15 years. Her goal is to inspire, enable, and support farmers across Africa as they engage in sustainable agro-ecological agriculture in order to alleviate poverty and to contribute both to food security and to a sustainable environment. Through Green Dreams Tech Ltd., she developed the award-winning mobile phone application iCow*

(www.icow.co.ke), winner of the first Apps4Africa Award, winner of the Vision 2030 Innovation Award for Agriculture in Kenya, and finalist in the Innovation Prize for Africa 2012. iCow today serves hundreds of thousands of farmers across Kenya. Su sits on the advisory boards of a number of global and local agricultural initiatives and is a TED Global Fellow.

What is particularly exciting about being an entrepreneur and why do you consider yourself as one?

I believe you cannot make entrepreneurs. They are born this way. It is something in their DNA that creates this particular insatiable drive that is so characteristic of an entrepreneur. True entrepreneurship cannot be forced through education, only honed by it. I think that is one of the reasons why we see high failure rates among businesses and start-ups. Not everyone is born to be an entrepreneur. One key factor that differentiates entrepreneurs from other people is passion. Entrepreneurs will go beyond the call of the business plan and the idea of making money. They will knock their heads against the wall trying to solve a problem, because they have become extremely passionate and obsessive about it, and they will keep on going at it against all odds.

Sometimes I look down my career path and question whether it could have been different. The answer is always the same. No way. No regrets, and no brakes. There is nothing in me that would allow me to stop. I cannot see into the future, but I just know that this is what I am made to do, and that makes me a passionate entrepreneur. I believe in what I do. I am driven by an unseen and uncontrollable force, and I love it. I call this the entrepreneurial spirit. It is captivating and hugely exciting. A lifelong rollercoaster ride.

As an example, I was not educated or trained in agriculture at all, and I do not even think that my core is really about agriculture. I think just like many entrepreneurs: We look at the world through a lens of connecting dots and are able to see many more dots than other people. Entrepreneurs pick up ideas from many different spaces, sectors, and experiences and manage to put them together into something new. Whether I am watching a movie or walking down the road and whether the movie is about science fiction or about wildlife, I am always picking up new ideas that I can bring

back into my context. It is a constant awareness that allows new light bulbs to light up inside you—hugely challenging and hugely satisfying.

My first job was in a bookshop, where I learned early on that I was not an employable person. I found it deathly boring. I realized very early on that I could not be employed and that I like to charter my own course. That I like control and like to be in the driver's seat. Looking back, this determined streak was evident even at 18 when I left school to join a band. This period gave me the creative space to learn how to earn my own living, despite its ups and downs. Coming from a very creative family, I found it easy to start income-generating projects and did everything from making wooden key chains to selling pies and biscuits. I set high standards for myself in everything I did. They had to be the best. All or nothing.

I was always making something and selling something while I was doing music. Later, I married and moved to South Africa with my husband and two children to join my sister-in-law in business. It did not last very long, because I found it impossible follow someone else's instructions while feeling that mine were more creative, constructive, and productive.

You started your entrepreneurial journey with the organic vegetable company Green Dreams before you ventured into technology. Tell us how it all started!

It started with a hydroponic farm visit in South Africa where lettuce for the fast-food industry was grown. In hydroponics, you do not use soil. The system used plastic-lined troughs and small stones as a growing medium. It is a chemical- and pesticide-intensive process aimed at growing high yields in minimum spaces. It really triggered my interest, and I began to imagine its value in our slums in Kenya. I am not quite sure whether I actually came into agriculture with an interest in agriculture or because of the curiosity for something that just seemed so cool and different.

We returned to Kenya and tried to put up demo sites — and failed abysmally because we knew nothing about the real requirements of plants. We were not from an agricultural background at all, so in the beginning, we faced lots of failures. I have learned to think of my failures as “learnings” and, like many entrepreneurs, expect a continual stream

of them going forward. The talent of an entrepreneur is really to fall forward, often. The crops were infested with pests and disease, failing to grow until we got rid of the hydroponics and put them into soil with drip irrigation in my mother's garden. In no time, we ended up with a whole bunch of lettuce that we then had to sell with the added value of being cleaned and packaged. That is how Green Genes started which turned later into Green Dreams. We (my family and I) crafted little labels, stuck them on the bag, washed the lettuce, and bagged it—and they sold like crazy. We continued developing mixed lettuce bags that were popular in South Africa but nowhere to be seen in Kenya. As the demand grew, we started to involve out-grower farmers in the vicinity, and eventually we had our products in the supermarkets, airlines, and hotels.

My role required managing a growing team as well as a growing range of products and customer preferences. After two years and a close call where my mother became quite ill after being exposed to a lethal pesticide, we changed our production system from conventional, using agro pesticides and fertilizers, to organic production, which is better for our producers, customers, soils, and the environment.

You worked intensively with Kenyan farmers. Can you give us an idea on what farming is like in Kenya today?

As my business grew, I started to look at widening my supply chain and increasingly worked with smallholder farmers as out-growers. A tragic instance where my mother got caught downwind with pesticide and became very sick shifted my mindset about safe food production completely away from industrial production to organic farming. Producing safe food—called organic at the time (we call it agro-ecological today)—is, of course, food that you grow without the use of artificial or synthetic pesticides or toxins. It required educating my entire supply chain on how to produce organically.

In Africa, being a farmer is quite different from the heavily subsidized, trained, and incentivized farmer from the West. Here, the majority of farmers are people who just try to eke out a living on their land and sometimes sell some of their produce in the market. Unlike in developed countries, farmers here were not growing only wheat or only maize. Smallholder farmers grow

on average around 5–8 different crops and vegetables, an assortment of root vegetables, brassicas, fruit, and grains as well as keeping up to four different species of livestock—cows, chickens, goats, sheep, and pigs. Production of this diversity requires a lot of knowledge, and in Kenya we do not have an adequate extension system in place that can deliver so much diverse knowledge at scale. The risks in agriculture are high, and farmers cushion their risk through diversification. To reduce their risks further, they need in-depth knowledge on each of the crops and livestock they keep. The problems the farmers were facing became more obvious to me as I trained them on the product requirements for my business. Lack of knowledge was manifesting itself in reduced yields, poor quality crops and livestock, low farmer income, and poorer and older farmers, because young people were not interested in working in such a tough industry. I also began to realize how the problem was much bigger than just in the organic sector, but countrywide. Where 80 percent of the food that comes to market in Kenya is produced by small-holder farmers, it was becoming apparent that the low-yield production from farmers plus the vagaries of climate change would soon be affecting food security for the nation. This began to concern me and at the same time interest me in creating a solution to this humongous problem.

How can small-scale farming be turned into a market opportunity?

To begin with, we need to understand the parameters within which small-scale agriculture exists and the opportunities that are available when we combine it with technology and other factors.

As a nation of tribes, we are connected to our land—where the biggest asset we have is our land. Culturally, we inherit and pass on land to family members. This has resulted in many land subdivisions, with the result that most farmers or landowners own relatively small parcels of land—meaning that a model for increasing food yields and quality in Kenya must take this fact into consideration.

While the biggest employment opportunity in Kenya lies in agriculture, young people are the targeted segment of the population to move agriculture forward. The challenge therefore is to attract young people into agriculture, given the many obstacles—small parcels of land, land ownership issues, lack of access to capital, lack of access to knowledge

(production and processing as well as other opportunities in the various agricultural value chains), and lack of access to markets. Parts of this complex puzzle have been solved in other countries, such as China, where the use of micro mechanization has tackled the problem of small land-parcel sizes. In Kenya, we do however have the advantage of mobile money. When we couple mobile money, a large youth bracket, micro mechanization, millions of landowners, and millions of consumers, we can create exciting hybrid businesses models and industries that create wealth and build the economy. In so doing, we can build food security not only for Kenya, but for Africa.

One model could be contract farming, where young people—through consultancies and businesses—till the land and install drip irrigation for landowners, who then buy the crops for value addition, processing, and marketing. This model is customizable to Kenya and the complexities mentioned above about land and culture, and it is also much more equitable and better for the country and its people as a whole.

The challenge is to make these kind of opportunities appealing to young people by, for example, empowering them with knowledge on the availability of various agri-technologies—such as drip irrigation, shade netting, micro mechanization, and so on— so that they can build, collaborate, and even create businesses with landowners.

There is a more efficient way of farming in Kenya, if we combine our cultural inheritance system with the power of technology. But we have not yet fully figured this out.

What are some examples and success stories of new ways of farming?

There are many ways to make agriculture sexy again. First of all, let us look at what makes it unsexy.

Farming is back-breaking hard work. At the smallholder level, it is mainly manual and is fraught with risks, some manageable and others completely out of one's hands (e.g., the weather). A farmer's life is made even harder because he or she is bound to the farm through weekends and holidays and typically does not have a pension or healthcare or livestock

insurance. Although farmers perform the most important function of any sector in a country—that is, to produce food—in Africa they are typically ignored and left to their own devices. There are no guarantees in farming. The challenge thus is to turn this around to attract the youth to get engaged in the sector.

During the post-election violence of 2007–2008, I was asked to support a group of young people in Kibera who had been thugs but decided to turn a garbage site into an organic farm. In three days, the land went from garbage to soil as the garbage was removed. One hundred days later, the group was feeding their families and selling surplus vegetables to families in the slum. The success was remarkable because the job was not back-breaking. What made it easy was the use of drip irrigation and a planting system that allowed for an easy way to grow a multitude of vegetables and crops while reducing the likelihood of fungus and other diseases. Making these technologies visible to these young people allowed them to see the benefits and opportunities of making a living from agriculture.

Look at one of our customers on iCow, for example. We stumbled across Aaron when we conducted research on farmers using the iCow platform. He initially went to IT school and tried to find a job in Nairobi. He could not get a job and decided to go back home to his rural area. Here his mom was growing broiler chickens, and he came back to join her in production. Once he made his plans clear, she said, “Not unless you do it with iCow!”—an agricultural information service that you subscribe to, to help enhance your productivity. She learned how to do it the right way, and because she experienced it by retrieving information from us, she was in a better position to produce chickens. He followed her advice, and by the time we got to interview him he was already on his ninth yield of chickens—and his vision of opening up the equivalent of a Kenchick or a KFC has unleashed his entrepreneurial spirit. He is a wonderful example of the kind of young person who learns the nitty-gritty details from the ground up and becomes an expert in his field, which then allows him to look for new opportunities to create value. For him, agriculture is sexy, because he has the ability to grow his knowledge and has affordable tools at his fingertips to do so. He is automatically ahead of a farmer who delves into chicken production without knowledge.

I envision the following model for Kenya: Imagine 40 plots, each a quarter of an acre in size, cultivated by elderly people in a rural area. Tough work. Low yields. Now imagine an organized crop-contracting service run by young people, providing these farmers with services to plow their land, install drip irrigation, and market their yields. The young people go a step further and engage in value addition as well as wholesale and retail sales. Meanwhile, payments are organized over mobile money. And retail outlets passionately market “Buy Kenyan, for Kenya,” supported by government policy. It can happen! These kinds of approaches take into account our local customs, our opportunities, and our national needs.

What exactly is the service that iCow is delivering?

iCow is a mobile phone-based agricultural platform that provides farmers with a variety of products that helps them build agricultural knowledge, reduce risks, and connect with their relevant agricultural experts.

When I designed iCow, the target user I had in mind was a small-holder farmer in Kenya. Sustainability of the product was based on a payment model by the farmers. Starting with a payment model from day one enabled us understand and build products that were of value to our users. It is difficult to evaluate a free product.

The information products on iCow are either subscription or pay-as-you-go products. The farmers receive their content to queries and education in SMS format that they pay for. What we are seeing in the field is that farmers archive the SMS content in exercise books for future reference.

One of the tools on iCow is the cow calendar. The farmer can register his pregnant animal and receive SMS messages about the specific point in the gestation of the animal so that he is aware of what he needs to think about next. He needs to feed the animal differently during this period, which is crucial for future health and milk productivity. Currently, the average Kenyan dairy cow produces six liters of milk a day. The exact same breed produces 40 to 60 liters a day in Europe. They are bred for heavy, high-intensity feeding, and in Kenya they are kept in small farms. There is still unmet potential as well as a disconnect between production systems and animal phenotypes.

We also have chicken calendars on iCow that help farmers with chicken breeding for the broiler market. The broiler's lifespan is only about six to seven weeks, so farmers register the day they get their day-old chicks, and we drip feed SMSs with a comprehensive approach to best broiler practices. These include feeding, vaccinations, hygiene, brooder temperatures, and much more.

Another tool is for soils, enabling farmers to learn about the general soils in their area and advising them to have their soils tested while also providing them with contacts for soil testing-service providers. We have uploaded the entire national soils database on the platform, allowing farmers to get loads of information on the particular soil quality in their area and recommendations that allow them to improve their soil quality. Knowing your soil quality or the specific problems of your soil allow you to make the right decisions about fertilizers—whether to use natural or synthetic and in what volume. Our objective is to enhance the knowledge of the farmer so that he can make informed decisions and decisions he can afford.

How did you scale iCow so that it could reach the broad mass of farmers in Kenya?

Initially, I had wanted to keep iCow agnostic across the three mobile-network operators, because I did not want to push the decision as to which network to choose onto the farmers. Later, because of our marketing strategy, we were fortunate enough to form a partnership with Safaricom. In the early phase, we did a lot of prototyping, tweaking, and product development, resulting in a good product that users liked. Our data showed that within three months of being on the iCow platform, farmers were beginning to see an increase in yields of between two and three liters of milk per animal.

Our exclusive agreement with Safaricom gave us access to their marketing machinery and we used a variety of different channels to market iCow. The response was astounding. At one point between 8000 and 14,000 farmers signed up on our platform every day, and eventually our system crashed. Once we hit 182,000 users in our database, we realized that our back end was not up to the task. Messages did not get sent, and our system became unreliable. We had to redesign iCow in its entirety.

During the one and a half year redesign phase, we added some new tools that came from both farmer feedback and my own experiences as a farmer. These were designed to tackle some of the main pain points in farming. In the redesign of iCow, with help from our partners The elea Foundation for Ethics in Globalisation and Accenture Switzerland, we increased our scope to cover multiple languages and territories, as by this time, we had also received many requests from countries in Africa, Asia, South America, and North America that wanted to use various components of iCow.

We have a variety of feedback loops with farmers that make product development demand driven and easier. So right now, 56,000 farmers use our SMS service three times a week. They are from over the entire country and range in age from 82 to early teens. Interestingly, the average age of farmers as reported by the government is 55. Once we started to do our marketing via Safaricom—using SMS—our average age dropped significantly, and according to our latest survey it is 33 years. With Safaricom, we managed to reach out to a whole new customer segment, which is incredible. We now know that farmers can afford a certain amount of SMSs in a week and are also willing to pay for it as long as they realize impact. My next challenge is to see whether we can provide more information in a shorter time span to create impact faster.

Thank you, Su!



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