

The Story of Opportunities Where Most Only Saw a Problem

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This story starts with a plant that most refer to as a weed, that grows wild and free and spreads all over.

It is known under many names such as Suryapatta in Sanskrit, Madar in Hindi, Biduri in Sundanese, Milkweed or Swallow-wort in English and Arka in Ayurvedic treatments. Its taxinomical name is *Calotropis Gigantea*.

The plant is abundantly present in the wild from West Africa to East Africa, India, Madagascar, the Arabian Peninsula and Southern Asia. More recently it has migrated to Australia and the Pacific Islands.

The *Calotropis Gigantea* has one or few stems, few branches and relatively few leaves, most of which are concentrated near the growing tip. It's very deep taproot has few near-surface lateral roots.

The leaves are oblong obovate to nearly orbicular and short pointed to blunt at the apex, with a nearly clasping, heart shaped base and short petioles.

The flowers appear in clusters, each flower consisting of five pointed petals and a small "crown" rising from the center which holds the stamens. The waxy flowers grow at or near the ends of the shoots. The shrub flowers throughout the year and its seeds, which are dispersed by the wind, can travel for several hundred meters. The plant reaches an average of 3-4 meters in height.

In many cultures the plant is not particularly welcomed.

The plant, when cut open, produces a white liquid which is very poisonous to the eye and often leads to blindness both in humans and livestock. This latex is highly toxic. It is neither edible for humans nor for livestock. For this reason a lot of superstition surrounds this plant.

In Cambodia the flowers are part of funeral ceremonies, and the plant has the questionable honor of being subject in an Indian curse; "May Arka grow at your door".

Historically stories are told about our plant, as being a "nurse

crop" [1]. It was the plant that came before all others. Creating a safe heaven for other vegetation to root and flourish. The myth says that when its job was done, and vegetation became abundant, it would move on.

This myth is not so far-fetched as it might seem. *Calotropis Gigantea* grows very well in almost all types of soils and different environmental conditions. It is a perfect example of a drought tolerant plant, and indeed pioneering vegetation in desert soil. It has no problem with depleted abandoned sandy soils or overgrazed native pastures [2].

It is highly drought resistant, surviving in areas with an annual average rainfall of 300-400 mm. It is salt tolerant to a relatively high degree. The only thing the *Calotropis Gigantea* avoids is snow.

In today's world where the depleted soil from mono culture farming and desertification is an ever growing problem, this particular plant might be able to rise to the challenge.

Its seeds float freely in the air and natural regeneration is very common. "(*Calotropis Gigantea*) is a weed growing everywhere without requirements for fertilizers and pesticides" [2]. *Calotropis Gigantea* is known to enable and create a microclimate for other valuable crops to return. Its pure size creates shade and more moist terrain.

As you might understand by this lengthy description, the *Calotropis Gigantea* is not a plant most farmers are excited to see appear. Yes, it grows and might restore the lands, but what to do with the actual plant?

Today in many communities it is simply burned.

Research into the qualities and particularities of the *Calotropis Gigantea* have been ongoing.

In Kenya in the 1980's research was conducted to investigate how this plant could be turned into something useful, and its potential for cotton production was noticed. Hopes were that the *Calotropis* could help alleviate poverty in the areas it grows by increasing farmer's income. If they would find a way to transform

this plant into a cotton like fibre, its usage could be an enormous plus for Kenya because it could then depend on some textile fiber of its own, rather than depending on imported lint for the spinning and textile industry [3].

If have tried to find the final outcome of the studies conducted back then, but as far as I can tell, nothing substantial came out of it, in terms of creating textile fibers.

Research has been conducted to investigate the seed fibers as an alternative source of cellulose. Early results have produced yarn that can be used to make a promising form of artificial silk [4].

There is little research on the textile properties of the plant, but a group of Chinese investors have shown a great interest in fabric made from its sibling *Calotropis Procera*. Clothing made from this flowering plant are said to hit shops any day now [5].

My point with the long introduction is to set the scene. The plant is widely available, mostly in rural communities, and if there would be a technique to transform this plant in a textile fiber, poor communities in different parts of the world could enormously benefit from it.

It needs no pesticides or herbicides to grow, making it the ultimate sustainable fiber, like linen.

There is a little Indian company, Faborg, who has spent the last 7 years researching and developing new techniques to use the *Calotropis Gigantea* [6].

The approach to the plant is very holistic and the criteria the research worked around are in my opinion admirable.

They have succeeded in creating their fabric, with respect for traditional knowledge, using traditional techniques and widely available materials. They selected only safe, cheap, socially and environmentally acceptable technologies that could be developed and promoted in the many other countries where *Calotropis* is widespread. It was key to find solutions that require little investments from communities if they want to start consolidating what already grows around them.

Faborg has worked hard to find a way to use the whole plant, and to make sure that no waste was created throughout the process. The fibers are naturally extracted, using machines that communities already possess.

Goal of the research was to find alternatives to the cotton textile we know, and simultaneously provide the possibility to rural communities to supply an extra income stream by utilizing what already naturally is abundantly present.

Last year, when we found Faborg, they just made an incredible breakthrough, and the first stable meters of fabric were coming out of the looms.

They managed to create a stable textile using 70% organic rain fed cotton, 25% *Calotropis Gigantea* fibers and 5% *Calotropis Gigantea* pods.

Today, they have upscaled production, yet research is ongoing. Dialogue with farmers to view the weed differently are essential to secure supply.

The company has marketed their material as Weganool.

Testing has shown that the textile has antibacterial properties. And it does take color when dyed with natural colorings [7].

As a designer committed to working with plant based and natural materials, our options seem to exist only from the obvious.

Imagine how big my excitement was when last year I came across the Weganool. A material I had no understanding of, never had seen before and no general ideas of how it moves or responds to a body.

It felt like a combination of a treasure-hunt and exploring new worlds all in one!

Upon visiting the company, seeing the community sitting around, extracting the fibers manually, soaking and processing the fibers and transforming the local weed into a soft airy textile, it felt like magic to me.

The material itself blew my mind. It felt like cashmere, moved like water, was floaty, light, and warm.

My company has had the honor to hand carry the first meters of Weganool to Europe and transform it into children's garments [8].

The children wearing the garments during photoshoots and fittings was a joy to watch, twirling around the studio. The surprise on their face about how light yet warm the material was, once they tried on the garments. The response at the Future Fabrics Fair in London in January 2020 was overwhelming.

The touch of the garments created joy and awe. The knowledge it was created from a plant, yet the tactile experience of a fine wool took people by surprise.

The potential of this material, for the future of our planet, and the possible positive impact on rural communities around the globe cannot be overestimated.

In times that we are all looking for social and environmental sustainability, it is my hope that this material will enter our wardrobe. That it will become one of the staple fabrics in future sustainable fashion design.

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