

## Shelter in place? One alternative to economic migration

**David Sharry** researches alternatives to economic migration from "the periphery" and has researched aid to "the rural periphery", both via an anthropology (Ph.D., Harvard University) he calls artisanal.<sup>1</sup>

Proverb: *Si bebes agua de pozo, no te vas de Yucatan*  
(He who drinks the local well water will never leave Yucatan)

**Abstract:** *In a rural part of Mexico's Yucatan state, a small-scale (11-50 employees) and simple (7 work specialties) industrial sisal<sup>2</sup> processing enterprise may provide an alternative to out-migration from the region and emigration from the country. Indications are that the convergence of 1) rising environmental consciousness, 2) modern-science-based new applications and markets for white "sisal" (Sp., henequén blanco; L. agave fourcroydes), allowing 3) better pay/labor conditions, while retaining 4) a semi-mechanized/moderately labor-intensive/draft-animal-assisted process can attract the number of young people required to sustain an improved way of life. Modern environmental water and soil conservation practices in Yucatan (e.g., orchards and terracing) are consistent with lowland Maya practice in the PreClassic (2500 BCE – 250 CE) and early Classic (250 – 700 CE) stages of their culture.*

**Keywords:** *Yucatan, Periphery, Out-migration, Emigration, Environmentalism, Green economy, Natural fiber, Agave fourcroydes, White henequen, "Sisal", Semi-mechanized processing*

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1 The author acknowledges with deep gratitude the expert assistance in the research for this article of Sr. Manuel Sabido González Pico, Fiber Shredding Plants Manager (retired) of the former parastatal corporation Cordemex; the author similarly expresses his heartfelt thanks to photographer Blanca Rosa Sabido González Pico, who took all photos not otherwise credited.

2 *Agave fourcroydes*. While "sisal" is usually used in English as a generic equivalent of *henequén*, strictly speaking, white henequen, the *Agave fourcroydes* (Sp. *henequén* (Ay-nay-KAYN) blanco; Maya Sak-Ki), which concerns us in this paper and green henequen, the *Agave sisalana* (sisal) (Sp. *henequén verde*, Maya *Yax-ki*) are two distinct species. (E.F. Legner) Contrary to common misconception, the more than 200 *agave* species are not related to the cactus family.

**Sommario:** *In una zona rurale dello stato messicano dello Yucatan, un'impresa industriale di lavorazione della sisal, piccola e semplice (11-50 addetti e 7 specializzazioni lavorative), può rappresentare un'alternativa alla migrazione dallo stato e all'emigrazione all'estero. Ci sono motivi per credere che la convergenza di 1) consapevolezza ambientale in aumento, 2) nuove tecnologie produttive e nuovi mercati per la sisal bianca (*Sp. henequén blanco*; *L. agave fourcroydes*), che permettono 3) migliori condizioni salariali, pur mantenendo 4) un processo semi-meccanizzato, a moderata intensità di manodopera e assistita da animali da tiro, possa attirare un numero di giovani sufficiente per sostenere condizioni di vita migliori. Pratiche moderne e ambientali di conservazione del suolo e dell'acqua nello Yucatan (ad esempio frutteti e terrazzamento) sono coerenti con i sistemi adoperati in pianura dalla civiltà Maya nei periodi pre-classico (2500 a.C.-250 d.C.) e alto classico (250-700 d.C.) di quella cultura.*

**Parole chiave:** *Yucatan, periferia, migrazione dallo stato, emigrazione, ambientalismo, economis verde, fibra naturale, agave fourcroydes, agave bianca, sisal, lavorazione semi-meccanizzata*



## A Visit to the San Carlos Shredder (*Desfibradora*) at Baca, Yucatan, Mexico

Saturday, April 23rd, 2016

It's about eight o'clock in the morning. Anthropologist David Sharry, *henequén* expert Manuel Sabido and photographer Blanca Sabido pull into the town of Baca. We are there in hopes of seeing the "San Carlos", a *henequén* fiber shredding operation on the outskirts of this town of 4300 inhabitants situated some 20 miles (32 km) east of Merida, the capital of Yucatan state.

Before visiting the shredder, we stop in the town center to ask permission of San Carlos owner José Antonio Lara Ferrera. While he is not available, his cousin, Roger Ferrera Ruffino, owner of the neighboring Santa Rita shredder, assures us, on the part of the family, that we are welcome to visit either shredder. The San Carlos is one of only 17 shredders remaining in Yucatan state (2016), according to Pedro Parra, San Carlos manager and son-in-law of the owner, Sr. Lara Ferrera.



Cordemex Shredding Plants Manager (Ret) Manuel Sabido, San Carlos Shredder Manager Pedro Parra, Anthropologist David Sharry.

The object of the shredding operation is to separate the fiber (Maya, *sosquil*) (DeChile.net) from the chaff (*bagazo*) and "chaff juice" (Sp. *jugo de bagazo*) of the leaves (Sp. *pencas*). The fiber (Cordemex# media) is used for traditional products like cordage for making the lines and rigging (Sp. *jarcia*) of sailing vessels,

rope for making hammocks, and string for making “100% sisal” burlap bags (those not made of jute or some other natural fiber), including bags of various weaves for coffee, corn, and carrots---twine for baling hay, products like carpets (*alfombras*), mats (*tapetes*), handbags (*bolsos*), “shopping bag” satchels (*sabucanes*, a word of *taíno* origin), backpacks (*mochilas*) (Legner<sup>3</sup>), and, increasingly, for newer applications like steroidal chemicals used in the pharmaceutical industry (G. Gereffi. 2017), and for high-value applications in expanding markets such as paper, reinforcing composites, and plastic composites (D. Díaz-Battista, W. Saint Blancard-Valdés, Dr. V. Bridi-Tellez. 2018).

### **The San Carlos semi-mechanized/moderately labor-intensive/draft-animal-assisted process**

1) Typically, personnel, not employed by the shredding operation, arrive on a truck and unload bundles (*rollos*)---each made up of 40 *henequén* leaves or blades (*hojas* or *pencas*)---on the ground in front of the shredding machine (*raspa de ruedas*).



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3 Erich Fred Legner. Botany Faculty Emeritus. University of California Riverside. *Amerindian groups have used this native Mexican species since ancient times. By the mid 20th Century Cuba and the Yucatan Peninsula produced most of the crop. The leaves bear spines that make them difficult to handle. The light straw colored fiber is scraped out from the leaf tissue. It is hard, elastic and wiry, measuring 2-5 ft. in length. It was used mainly for binder twine, lariats and durable mats.*

2) Each *rollo* arrives tied with a lashing cord (*trinca*) made of *henequen*.



3) Shredder personnel (*raspadores*) unbundle the *pencas* by removing the lashing cord (*trinca*), place the *pencas* parallel to the edges of a conveyor belt, which feeds them into the shredding machine. *Raspadores* then count the cords and return them to the *henequén* owner---based on which the shredder owner will pay him for each *rollo* delivered. The cords are also returned so that they can be used again.



4) The shredding machine (*raspa de ruedas*) is a *Corona* model, manufactured in Germany.





5) A fiber hauler (*acarreador*) loads the fiber (Maya, *sosquil* [“SosKEEL”]) onto a wooden flatbed (Sp., *plataforma*; Maya, *trook*). A mule pulls the *trook* on rails to the



6) *calles* (“cayays”), wire structures where the fibers dry, normally for 24 hours. Shredder company management apportion *calles* by *henequén* owner.



7) *Bagazo* (chaff) is the term for the diced husks, that are a by-product of the shredding of the *henequén* leaves (*pencas*).

Shredder company management return the *bagazo* to the *henequén* owner to be used as animal feed or fertilizer. A chaff hauler (*acarreador de bagazo*) shovels *bagazo*, which had dropped from the shredder during the shredding process, into wooden wagons (*bagaceras*). Mules pull the *bagaceras* on narrow-gauge rails to where workers load the *bagazo* into bags. The *henequén* owner pays San Carlos Shredding Management 6 pesos per bag---reportedly, the cost of the bag alone---the *bagazo* being gratis to the *henequén* owner. If the *henequén* owner does not claim the *bagazo* from his *henequén*, shredder management use it to fertilize shredding machine owner José Antonio Lara Ferrera's gardens and orchards on the San Carlos grounds, where watermelon and tomatoes--among other produce---- are grown.



8) *Jugo de bagazo* (the “juice” of the leaves) flows off in a canal from beneath the shredding machine to where it will be converted to biogás (Y. Moguel. 2008) or collected to be used as the basis for an anti-mange medication (Sp., *medicamento anti sarna*) (R. Plascencia Pérez 1982).



9) Packers (*empacadores*) use a screw press to mold the fiber (*sosquil*) into bales (*pacas*). They weigh the fiber of 1000 *pencas* (i.e., the fiber of 25 bundles (*rollos*))



of 40 *pencas* each). The shredding machine owner will pay the *henequén* owner using that weight as a double check on the number of bundles--- counted by their cords---that were shredded.



## **A Future for Henequen Processing: The Challenge of Attracting Younger Local Workers**

During a visit (July 23, 2016) to the José María Morelos Shredder (*desfibradora*) in Telchac Pueblo, Yucatan, the author asked the shredder's owner, Don Bernardino Martín Chan, why the workers were mostly older men. He answered: *Recruitment of quality personnel is difficult because the work is physically hard and one is exposed to the elements. Work in air-conditioned maquiladoras (assembly plants) is more attractive to most, and young people, especially men, want to live/work in a city.*

A young Yucatecan entrepreneur recently underlined this reality: *Our challenge is to convince young people that the future of rural areas is promising. There is a vast local, national, and international market that has a demand for products from the Yucatecan countryside* (P.Cabrera Quijano. 2019<sup>4</sup>).

### Prospects for change

The San Carlos is an example of small steps toward defining a future for rural Yucatan that can attract the number of young people required to participate in its becoming reality. In this effort, there are some promising signs.

The young of Yucatan are increasingly environmentally conscious (A. Legorreta. 2017)<sup>5</sup>. Dovetailing with this fact is the environmental soundness of the San Carlos shredding operation.

Environmentally sound white henequen final products created at San Carlos or intermediate products exported from San Carlos

1) **Natural fertilizer and Natural livestock feed** The award-winning Yucatan-native agronomic engineer Abdo Magdub Méndez, serving for several years as a consultant to San Carlos owner Sr. Lara Ferrera, implemented the use of henequén chaff (*bagazo*) as orchard fertilizer and animal feed (C. Ricárdez. 2014).

2) **Biogas and bioethanol** generated from *jugo de bagazo* ("chaff juice"). At San Carlos, Ing. Méndez implemented biogas production and proposed bioethanol production (V. Martínez. 2013)

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4 Sr. Cabrera is a businessman, and President of the Yucatan Produce Foundation, A.C., not-for-profit organization.

5 "Fortunately, the young between 18 and 35 years old have been recognized worldwide as a generation with acute environmental consciousness. This generation is making an active commitment to everything that means sustainability and preservation of the natural environment". Translated from the Spanish.

3) **Natural fiber for weaving cloth**, as substitute for synthetic cloth  
*Foreign customers are increasing in number. Japanese and French customers prize the resistant fiber of the Agave fourcroydes for weaving fabric.* (Fraunhofer. 2012)

4) **Natural fiber**, as substitute for plastic fiber, **for keeping ship hulls free of marine organisms. German customers prefer it for cleaning the hulls of large ships serviced in German ports** (Fraunhofer. 2012. Ibid)<sup>6</sup>

5) **Anti-mange medicine** from the *jugo de bagazo* (“chaff juice”) of the *Agave fourcroydes* (O. Palomar)

6) **Natural fiber for use in polypropylene composites.** Mounting worldwide concern about plastics has led to an opting for the use of white henequén (*Agave fourcroydes*) fiber in polypropylene composites for vehicle parts including, doors and dashboards (A.M. Dzul Ek. 2015)

## A Profile of the San Carlos Shredder Organization

**Scale:** The *Desfibradora San Carlos* (San Carlos Shredder) falls within the Mexican Secretariat of the Economy (SE) and Secretariat of Revenue and Public Credit (SHCP)’s 2009 definition of a small enterprise (*empresa pequeña*) in the industrial or service sector as one with

- 11-50 employees (T.M. Moreno. 2009)

Characteristics of small enterprises include:

- Fewer workers than larger enterprises: smaller teams of employees run by an individual or small management team.

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<sup>6</sup> If a ship is at anchor for longer periods algae, shells and barnacles will colonize it. Every year, this so-called biofouling causes economic losses of billions of dollars. Biological growth on the underwater surface promotes corrosion. The deposits increase the roughness of the hull below the waterline which has a braking effect as the ship travels. Depending on the roughness of the basified bio layer, the consumption of fuel can increase by up to 40 percent. In the case of a large container ship this can result in additional annual costs of several millions. All the countermeasures used to date have considerable drawbacks: Cleaning the hull by sandblasting in a dry dock removes also the painted coating and can only be used every three to five years. There are effective hull coatings preventing the growing of adhering bio layers, but in most cases by ecotoxic biocides. Both copper ions and synthetic biocides accumulate in the coastal water and in the sediments.

– Lower revenue than larger-scale enterprises, but not necessarily lower profitability, since established small-scale operations may own their plant and equipment, reducing costs compared to leveraged businesses (D. Ingram 2018)<sup>7</sup>.

**Complexity:** Relatively Few Work Specialties:

- 1) Manager (*Encargado*)
- 2) Shredders/Shredding Machine Personnel (*Raspadores*)
- 3) Fiber Hauler (*Acarreador de Sosquil*)
- 4) Chaff Hauler (*Acarreador de Bagazo*)
- 5) Packers (*Empacadores*)
- 6) Gardeners/Orchard workers (ancillary personnel)
- 7) Biogas personnel (ancillary personnel).

**Reverence for Nature Comes Full Circle:** The ancestral Maya noted that events in the universe occurred in observable cycles (Z. Zorich.2013). It seems appropriate, therefore, that Pre Classic (2500 BCE-250 CE) and early Classic (250-700 CE) Mayan civilization's reverence for soil as a sacred gift from the ancestors (C. Wells, L.D. Mihok. 2009) and of henequen as a sacred plant the usefulness of which the Maya learned from Zamná, a mythical priest (*chilam*) and founder of Chichen Itzá (J.Lopez Portillo y Rojas), is being rediscovered and appreciated by advocates of modern Yucatecan environmentalist practices (timeanddate.com).

A belief in the celestial *Chaac* (lord of rain and water) and the *Kanans*, spirits which protected fertile lands with dark soil (C. Wells, L.D. Mihok. 2009), reinforced these traditional practices<sup>8</sup>.

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7 Not every small business eventually grows to the size of large corporation. Some businesses are ideally suited to operate on a small scale for years, often serving a local community and generating just enough profit to take care of company owners.

8 Time and Date.com. It's worth noting that Maya calendars reflect that people's cyclical concept of time. Wheels Working Together *The Mayan Calendar consists of three separate corresponding calendars: the Long Count, the Tzolkin (divine calendar), and the Haab (civil calendar)*. Each of them is cyclical, meaning that a certain number of days must occur before a new cycle can begin. The three calendars are used simultaneously. The Tzolkin and the Haab identify the days, but not the years. The Long Count date comes first, then the Tzolkin date, and last the Haab date. A typical Mayan date would read: 13.0.0.0.0 4 Ahau 8 K'umku, where 13.0.0.0.0 is the Long Count date, 4 Ahau is the Tzolkin date, and 8 K'umku is the Haab date.



In sum, the research reported here leads to the consideration that the convergence of environmental consciousness and modern-science-based new applications/markets for white henequen can allow better pay/labor conditions based on small-scale, relatively simple semi-mechanized/moderately labor-intensive/draft-animal-assisted henequen processing that can attract the number of young people required to sustain an improved way of life as an alternative to out-migration from the region or emigration from the country.

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