Building a Caribbean Seaweed Industry

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Industrial Development & Innovation

- A culture of Industrial Development and Innovation is only possible when we write less papers and build more prototypes.

- A Picture is worth a thousand words, but a Prototype is worth millions.

Rule #1 for Industrial Development

- Research is based on seeing, observation, interaction with resources, science and engineering.
- Concept Exploration – see an abundance of new ideas, select the better ideas, based on selected resources and processes.
- Development- Prototype- See how it works Test- Market Test
- Market- make it sexy (attractive)
- Commit to ongoing improvement until it diffuses and then get out of there wealthy.

Rule # 2 for Industrial Development

- You cannot start an industry with a scare resource in mind. Free or extremely cheap abundant resources that produces final product for supply and demand chain.
- Start with free natural or free renewable resources.
- Start with the end – how would someone other than myself use this, since I want to export how would a Asian uses this.

Innovation Menu

Natural Elements Alphabetical by Name and by Symbols

Actiniun	Ac	Europiun	Eu	Molybdenun	Mo	Scandium	Sc
Aluminun	Al	Fluorine	F	Neodymium	Nd	Seleniun	Se
Antimony	Sb	Franciun	Fr	Neon	Ne	Silicon	Si
Argon	Ar	Gadolinium	Gd	Nickel	Ni	Silver	Ag
Arsenic	As	Gallium	Ga	Niobium	Nb	Sodium	Na
Astatine	At	Germaniun	Ge	Nitrogen	N	Strontium	Sr
Barium	Ba	Gold	Au	Osmium	Os	Sulfur	S
Beryllium	Be	Hafniun	Hf	Oxygen	O	Tantalun	Ta
Bismuth	Bi	Heliun	He	Palladium	Pd	Telluriun	Te
Boron	B	Hydrogen	H	Phosphorus	P	Terbium	Tb
Bromine	Br	Indium	In	Platinum	Pt	Thorium	Th
Cadmium	C	Iodine	I	Polonium	Po	Thallium	Tl
Calcium	Ca	Iridium	Ir	Potassium	K	Tin	Sn
Carbon	C	Iron	Fe	Promethium	Pm	Titaniun	Ti
Ceriun	Ce	Krypton	Kr	Protactinium	Pa	Tungsten	W
Cesium	Cs	lanthanun	La	Radium	Ra	Uranium	U
Chlorine	Cl	Lead	Pb	Radon	Rn	Vanadium	V
Chromium	Cr	Lithium	Li	Rhenium	Re	Xenon	Xe
Cobalt	Co	Lutetium	Lu	Rhodium	Rh	Ytterbium	Yb
Copper	Cu	Magnesium	Mg	Rubidium	Rb	Yttrium	Y
Dysprosium	Dy	Manganese	Mn	Ruthenium	Ru	Zinc	Zn
Erbium	Er	Mercury	Hg	Samarium	Sm	Zirconium	Zr

Rule # 3 for Industrial Development

- Avoid cultural blindness
  - Your culture blinds you from seeing abundant resources and opportunities.
  - When your culture darkens the light in the tunnel
  - When other cultures modes and means of innovation and development block out the light and takes over our mode and means of development and innovation.

Innovation Investment

- Another factor in looking at innovation investment is at human demands, before we look at market demand, the base human demands are:
- Fresh water
- Fresh food
- Security
- Work
- Rest
- Relationship
- Energy

Caribbean Industrial Context

- The fact that we are islands does not limit our means and modes of production, as Karl Marx defines it, but rather it contextualize and reshapes our means and modes of production, therefore small island states in the Caribbean under develop themselves, by not exploring the industrial and scientific opportunities within their contextual resource sphere.

Caribbean Development & Innovation

- For new industries to develop the abundant resource has to be explore for all its value added, therefore if Barbados and the wider Caribbean is to foster new industries, new economic growth, we must look at what are the abundant, free, sustainable, resources available to us, and if we accept this, then we will have a clear starting point for genuine Caribbean Development.

The Climate

- Sun
- Heat
- High condensation
- Two seasons wet and dry
- Consistent day night patterns.
- High wind

The Ocean

- Sea water
- Seaweed
- Sea life
- Sea minerals
- Sea plants
- Sea sand
- The island
  - Coral stone- Lime stone
  - Fresh water
  - Clay
  - High calcium soil
  - Biomass

Innovation Focus

- Judging from our innovation and industrial categorization, based on means and modes of production we in the Caribbean have what I call “Ocean Economy”, we are sea people. Barbados, we live on a coral reef. Must develop Ocean Industries.

Building a Caribbean Seaweed Industry

Cultural Blind Spot

- Ocean Industry


DRYING SEAWEED

The Target

To Develop a sustainable seaweed Industry in the Caribbean

Utilizing abundant raw materials

Leacaena (River Tamarind)

INDUSTRY VALUE

- The FAO fisheries and Aquaculture depart estimate that the global seaweed industry estimate a total annual value of US$5.5-6 billon a variety of product are produced. With the industry using 7.5-8 million tones of wet seaweed annually.
- Seaweed demand has outstrip supply globally, shortage of wild or naturally grown seaweed, therefore35 countries now engage in seaweed commercial cultivation, which now accounts for 90% of market supply.
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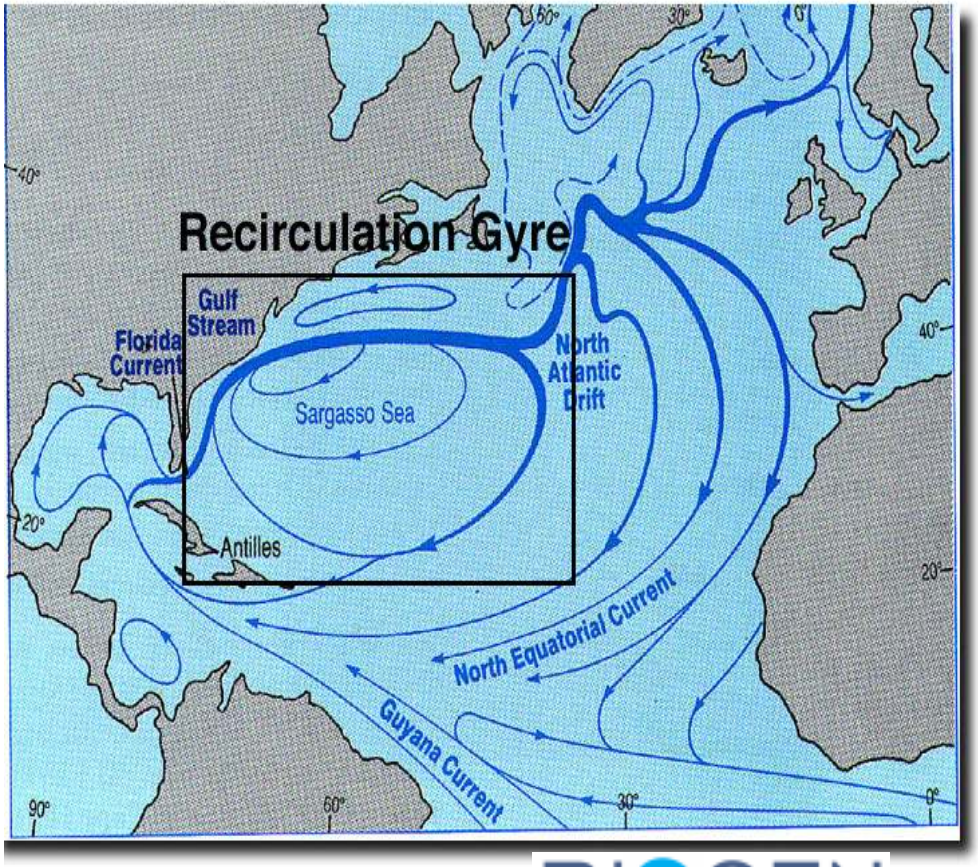
Ocean Currents

- Change in Ocean Pattern
- Change in Seaweed growth
- No Industrial activity with resource



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2011- 2015 ANALYSIS

12%
Moisture content
20,000 Dry Tons

GREENLAND SEAWEED PROCESSING PLANT

100,000-250,000 Wet Tones/Year Needed for Industrial Scale SEAWEED INDUSTRY

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BARBADOS SEAWEED INDUSTRY MAP

NORTH HARVEST 150,000 WT/Y

Gulf Stream, North Equatorial Current, South Equatorial Current

Excess Growth

GREENLAND SEAWEED PROCESSING

GREENLAND STORAGE & DRYING

HARVEST

LIVE SEAWEED

SEAWEED INFLOW 250,000 WT/Y

Export product Seaweed Extract

50,000 tons of extract
Value @ $120 Million

BIOMASS

Thermohaline Circulation

SOIL CONDITIONER / FERTILIZER LOCAL FARMS

NATIONAL CLEAN UP

SOUTH HARVEST 100,000 WT/Y

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Core Goal

Job creation for unemployed persons, women and youth primarily, facilitating community development.

Industrial Design philosophy

- Creation of solutions not rooted in high investment, capital intensive technologies, nor methodologies, for harvesting nor processing .
- Technique should be adoptable and implementable by low income earners.
- Solution must tell a Caribbean story, enhance historical offering.

Research in Horse or Donkey Harvesting

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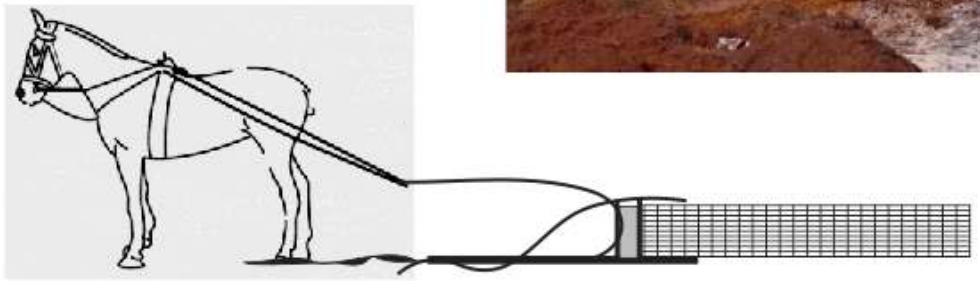
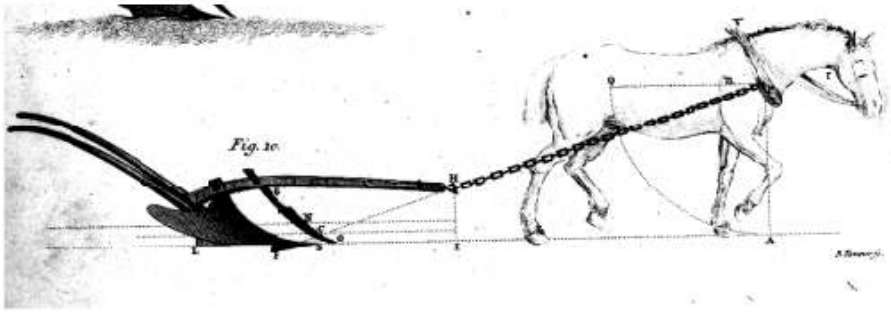
Industrial Design Process

industrial design process





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Seedling Growth Mix

Very Nutritious Meal

Seaweed Partial Board

PRODUCT DEVELOPMENT

- "BioPower-p" Liquid Sargassum Seaweed extract foliar spray compound bio organic fertilizer for plants pineapple banana melons

US $2000-6000/metric Ton

US $12.00 Liter

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BARBADOS SEAWEED TOURISM IMPACT

If we do not develop an industry from this biomass

QUESTIONS