

Yayasan  
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# Seaplants as the Basis for Integrated Mariculture in the Coral Triangle



Presented by Iain C. Neish of SEAPlant.net at the Sustainable Integrated Mariculture Meeting & Workshop Makassar, 27- 30 November, 2007

## IMPACT+

Integrated Multi-trophic Program for Aquaculture in the Coral Triangle + adjacent regions



**SEAPlant.net** working with tropical seaplant-based enterprises to develop IMTA opportunities

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**Three major  
seaplant  
opportunities  
in the  
Coral Triangle**

Focus on the  
"Coral Triangle"  
& adjacent regions

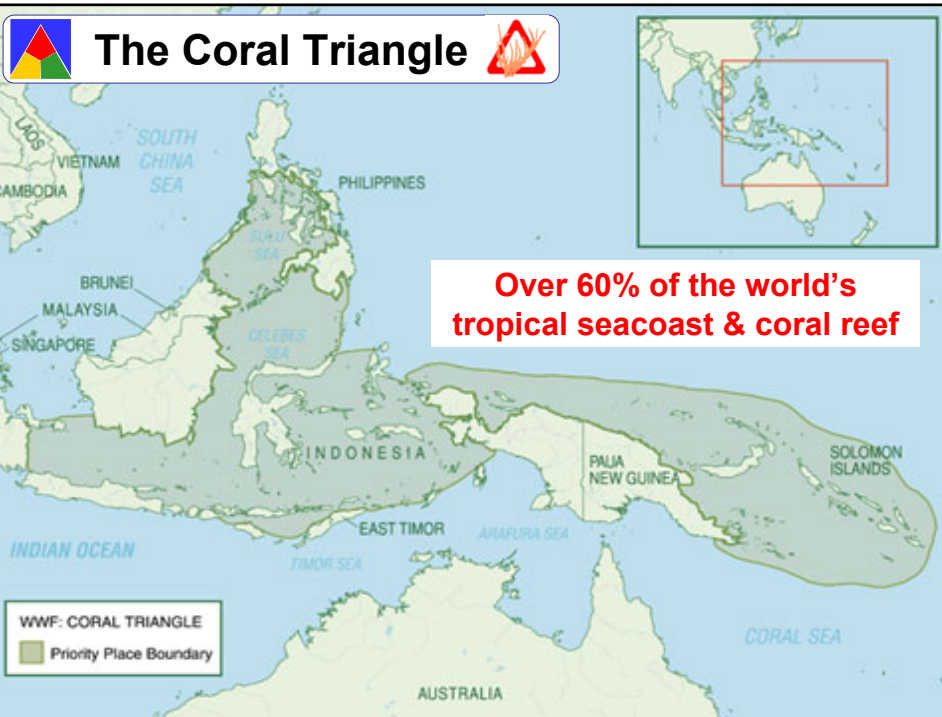
BIMP-EAGA is  
the core of the  
Coral Triangle



1.  
Capture  
more value from  
seaplant  
biopolymers.

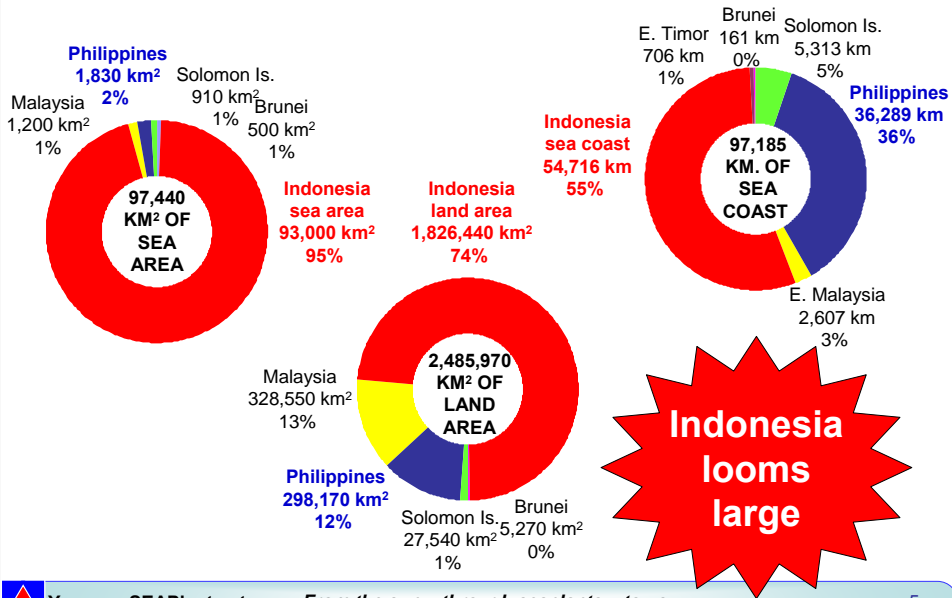
2.  
Utilize  
seaplant nutrients  
& bio-actives  
rather than  
wasting them

3.  
Build  
Integrated multi-  
trophic aquaculture  
(IMTA) on a strong  
seaplant foundation





# Coral Triangle Geography



1.  
**Capture  
 more value  
 from seaplant  
 biopolymers.**

## Moving forward means moving beyond “copycat” technology



- ❖ technology stagnant ~ 30 years
- ❖ same for product development
- ❖ much “copy & follow”
- ❖ little research & development
- ❖ innovation can have major positive value-chain impacts

## Basic RAGS value-chain products

### Red Algal Galactan Seaplants

#### RAW WEED

- ❖ **Gracilaria**
- ❖ **Spinosum**
- ❖ **Cottonii**
- ❖ **Sacol**
- ❖ poor standardization
- ❖ constant quibbles among buyers & sellers over MC and quality factors

#### BUILDING BLOCKS

- ❖ anything from seaweed to “pure” gum
- ❖ transparency, GMP & QC important

#### SOLUTIONS

- ❖ blends and systems built from building blocks

**transparency adds value...  
I.P. difficult to protect**

**intellectual property is a core asset**

## RAGS supply situation

### Gracilaria spp. & Eucheuma spp. (spinosum):

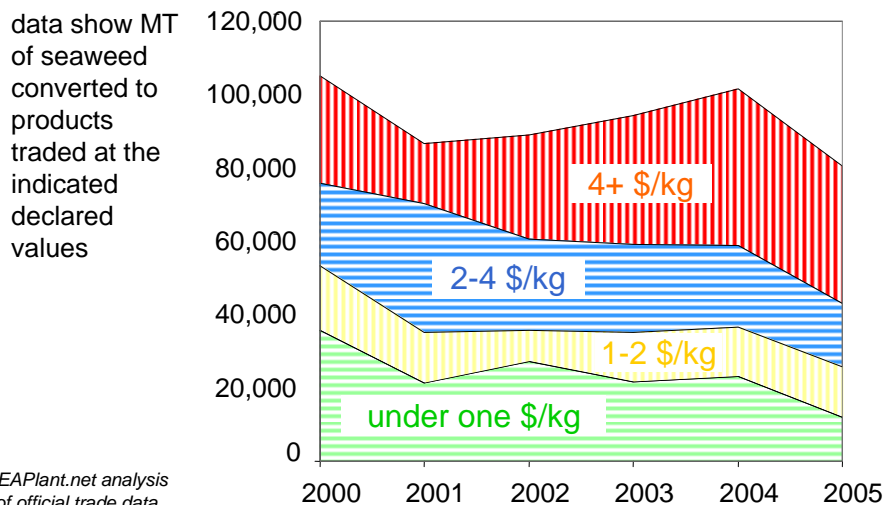
- ❖ Supply can easily out-strip demand
- ❖ Farmers will grow even at price below 150 USD/kg (commercially dry weight)

### Kappaphycus spp. (cottonii & sacol):

- ❖ Chronic under-supply for more than a decade
- ❖ Currently prices rising
- ❖ **\$1,000 / ton prices again !!**

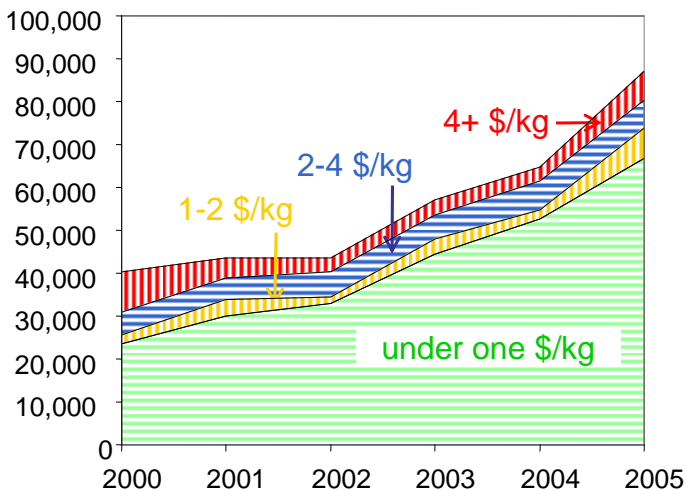


## Most Philippine seaweed is now exported with value added



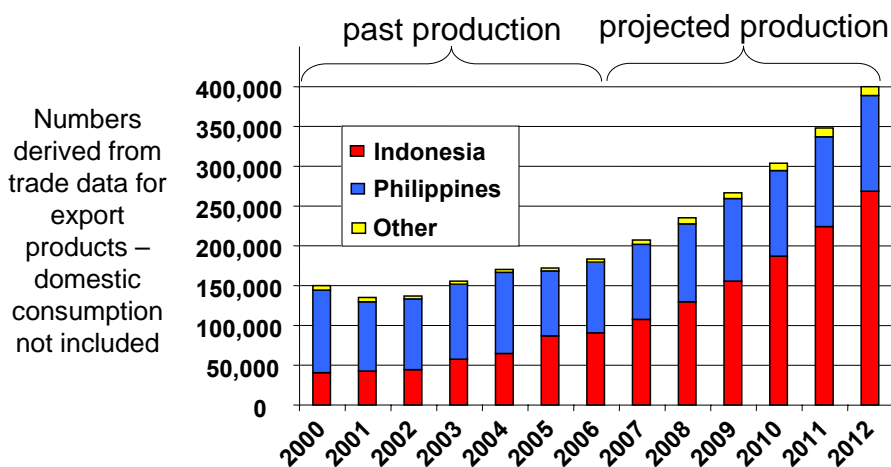
## Most of Indonesia's seaweed crop is still exported as raw weed

data show MT of seaweed converted to products traded at the indicated declared values



SEAPlant.net analysis of official trade data

## RAGS history & projections for CT



- ❖ Includes *Euचेuma*, *Kappaphycus* and *Gracilaria*
- ❖ Data expressed in terms of commercially dry tonnes of seaweed

## Key challenges...

- 1 Double the annual production of *Kappaphycus spp.* by 2015 – which may mean tripling in Indonesia
- 2 Build markets for carrageenan and agar concentrates produced by franchise systems
- 3 Extend the range of commercially useful cultivars... including new genera and species of seaplant

A very useful breakthrough would be...  
**robust *Kappaphycus* that is less seasonal**



need to screen wild Indonesian stocks for new cultivars



that grow as vigorously as *Eucheuma* during all seasons !!



**SPNF must find support for this screening program**

## 2. Utilize seaplant nutrients & bio-actives rather than wasting them

### RAGS value chains

R.A.G.S  
CROPS

INGREDIENT  
BUILDING  
BLOCKS

INGREDIENT  
SOLUTIONS

**Red Algal Galactan  
Seaplants (RAGS)**  
include  
*Kappaphycus spp.*  
*Euचेuma spp.*  
*Gracilaria spp.*

dry or semi-processed seaweed  
“pure” carrageenan & agar

blends ready for end-  
use applications

seaplant juice & concentrates

nutrient &  
nutraceutical products  
ready for use

**FOCUS ON  
THREE  
GENERA**



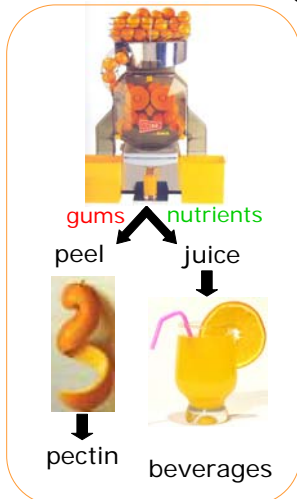
**With “traditional” technology  
1 ton carrageenan ≈ 1 ton nutrient solids**



**Millions of dollars worth of valuable nutrients  
have been flushed down the drain**

**Both “gum” and “nutrient” products  
are feasible if live weed is used**

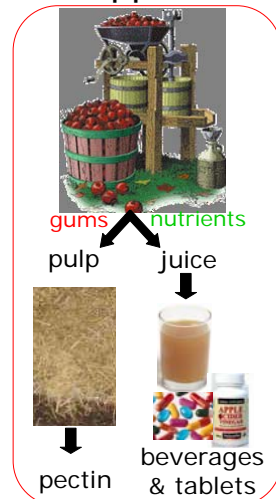
**citrus fruits**



**eucheuma seaplants**



**apples**



## Two value streams

- ❖ Less labour
- ❖ Lower energy needs
- ❖ Low water requirement
- ❖ No effluent



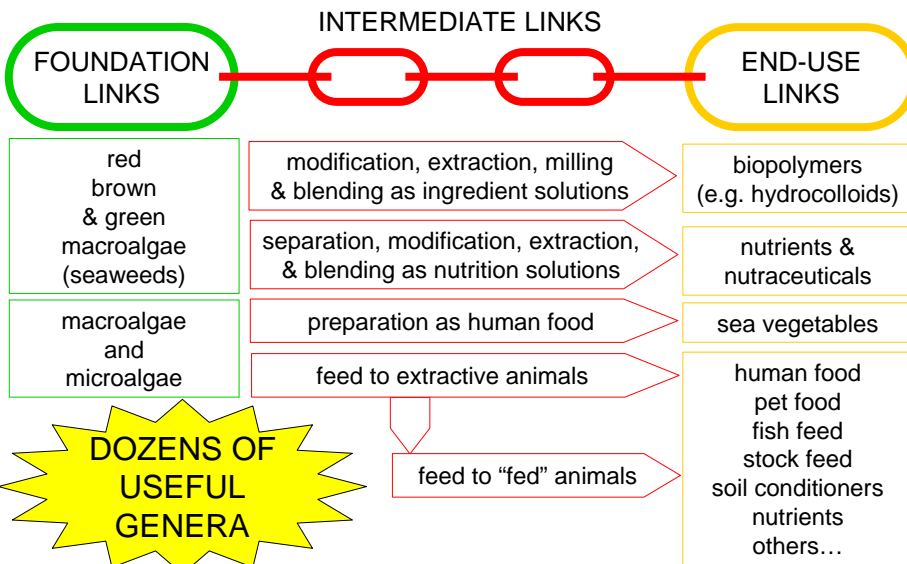
### NUTRI-ENTS

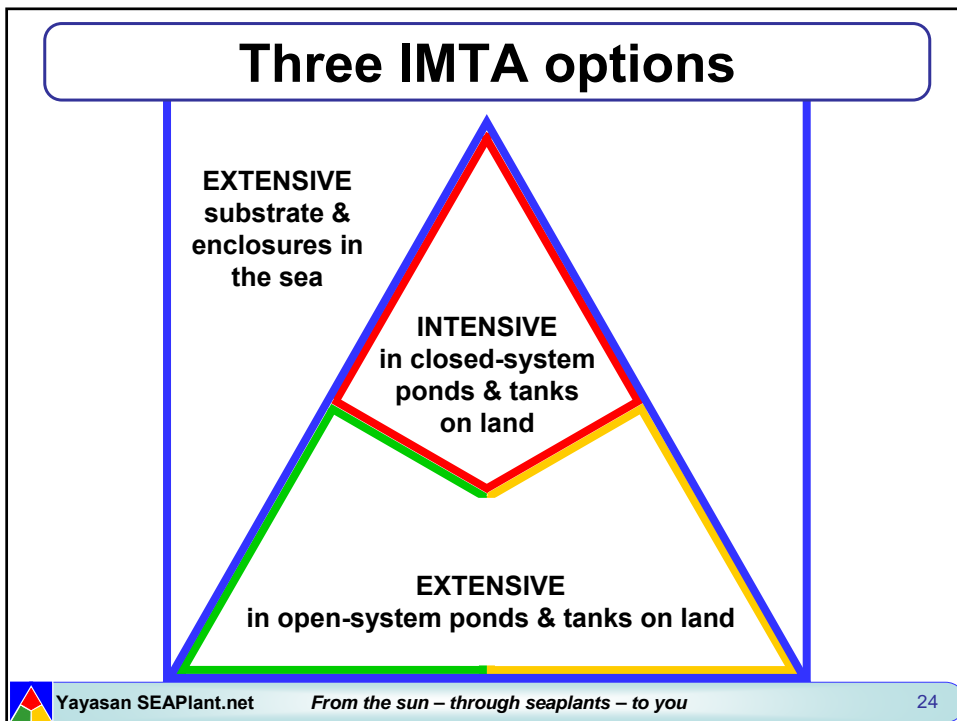
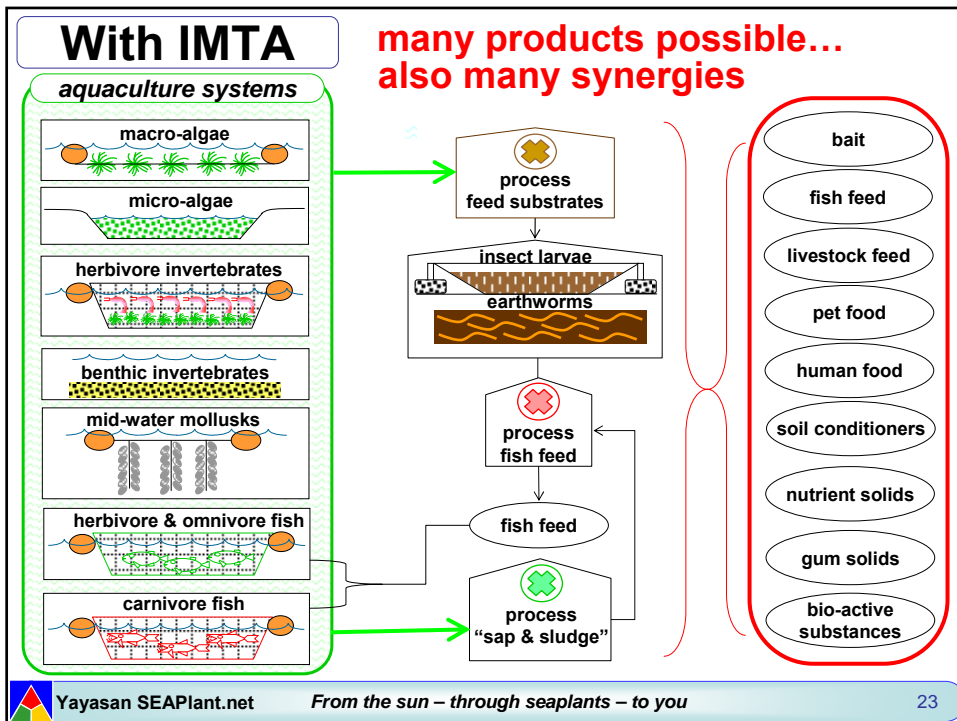
## Key challenges...

- 1** Build alliances and anchor buyer relationships for marketing of seaplant nutrient building blocks from the SEAFare franchise system
- 2** Foster & participate in scientifically sound studies of processing, chemistry, efficacy and composition
- 3** Extend the range of commercially useful cultivars... including new genera and species of seaplant

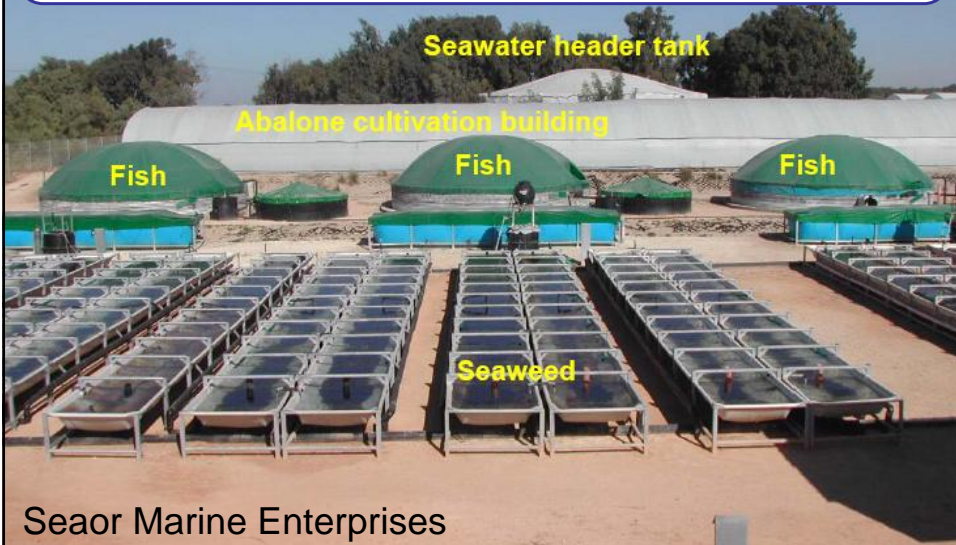
### 3. Build Integrated Multi-Trophic Aquaculture (IMTA) on a strong seaplant foundation

### Examples of seaplant value chains





**INTENSIVE in enclosures on land...  
high degree of control**



Seaor Marine Enterprises



**EXTENSIVE in ponds on land...  
moderate degree of control**



Palopo, Luwu, Sulawesi Selatan

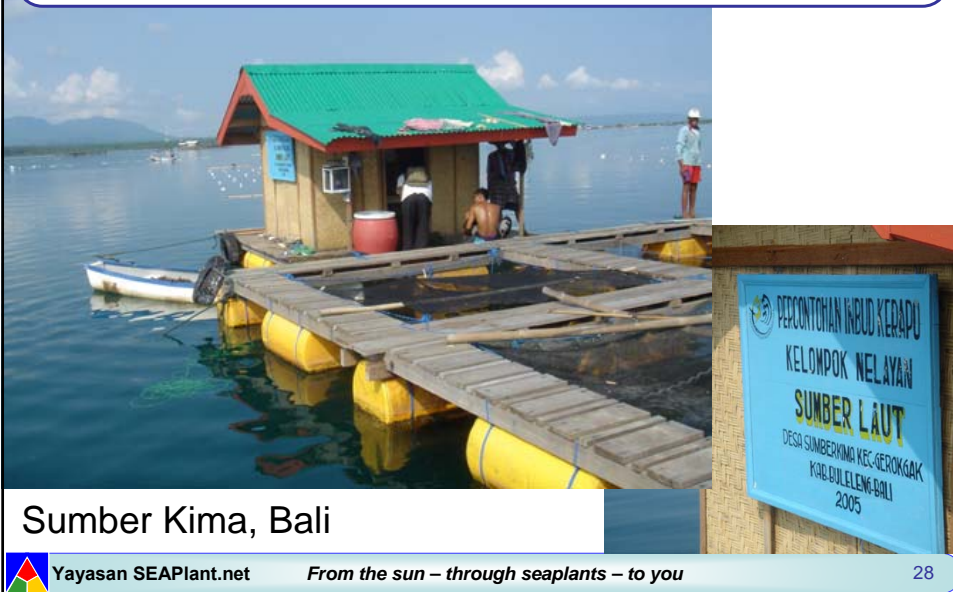


## Rationale for land-based IMTA

- ❖ Minimize ecosystem degradation by waste control & recycling
- ❖ Avoid harmful algal blooms, escapes and 'gene leaks'
- ❖ Avoid pathogen exchange between the culture and the wild
- ❖ Optimization of growth parameters & feed utilization
- ❖ Avoid regulatory constraints in common-property foreshore areas
- ❖ Minimize conflicts with other users of the sea, 'Greens' & NGO's
- ❖ Minimize weather damage
- ❖ Minimize poaching and vandalism
- ❖ Discharge of chemicals to the sea
- ❖ Control of composition for algae and animal crops
- ❖ The rate of water recirculation can be controlled & varied

(\* From Daniel Pauly as cited by Neori & Shpigel, 2006)

## EXTENSIVE substrate & enclosures in the sea... low degree of control



Sumber Kima, Bali

## An immediate opportunity... Cultured abalone, *Ulva* & *Gracilaria* \*



\* from Seacor Marine Enterprises

IMTA

## Key challenges...

- 1** Build and “IMTA Alliance” that supports development of the SEAFare franchise system
- 2** Establish steady growth in active franchise units of all three types
- 3** Extend the range of cultivars useful in IMTA... including new genera and species of seaplants and sea animals

## An essential key to success is...



## Business-enabled family farms are the key

processing steps must be undertaken “at the beach” by farmers aggregated into sustainable enterprises





## The SEAPlant.net Franchise system

business essentials for farmer enterprises  
that are...

**A**AVAILABLE

and

**A**CCESIBLE

and

**A**PPPLICABLE



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