An Analysis of the
Trade in Tropical Red Seaweeds and their Products
2000-2007

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focus on Indonesia and the Philippines in the BIMP-EAGA region of the Coral Triangle

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Global significance of the RAGS trade

For countries examined during the present study the RAGS accounted for about 52% of total value and 65% of total volume for total seaweed and gum imports. Proportions of various seaweed genera that appeared in official trade data are shown this figure.

The primary use of non-RAGS seaweeds was as human food or as raw material for making alginates. Non-RAGS gums compete with RAGS gums in some applications and are complementary in other applications.

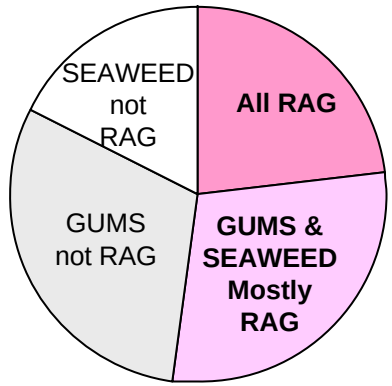
Annual global seaweed (marine macro-algae) production was reported by FAO to be on the order of 1.4 million dry tons per annum. According to the 2006 FAO analysis seaweed-based value chains generated a range of products with annual production value estimated at 5.5 -7 billion USD/annum. Of this human food products accounted for about 90%, hydrocolloids for about 6-8% and other products such as agricultural nutrients accounted for the rest.

Almost 90% of commercial seaweed production came from cultivation. The tropical RAGS were mainly from farms in the Coral triangle. Cultivated cold-water seaplants were primarily Laminaria, Undaria and Porphyra cultivated in China, Japan and Korea.

Since many seaplants and their products were exchanged in local markets there are gaps in the available statistics and actual volumes were undoubtedly higher than shown. For example Indonesia had a substantial domestic agar industry that required about 40,000 tons per annum of raw, dried Gracilaria but this material did not appear in generally available official statistics.

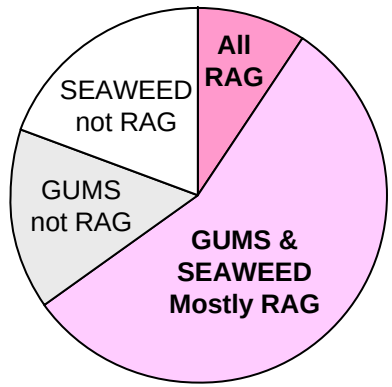
Food and Agricultural Organization of the United Nations (FAO) 2006. *State of World Aquaculture 2006*, FAO Fisheries Technical Paper No. 500 (FAO Rome), 162 pp. FAO / WB Study; "Value Chain Analysis of the Indonesian Seaweed Sector," June 2007

Global seaweed and gum imports for the countries and categories covered in the present study for the period 2002-2006. RAGS products accounted for about 52 % of total value and 65% of total volume.



A. VALUE IN K USD CIF

	TOTALS	%
All RAG	941,064	23.4
Mostly RAG	1,150,587	28.6
gums NRA	1,231,736	30.6
NRA swd	699,789	17.4
TOTALS	4,023,176	100.0



B. VOLUME IN TONS

	TOTALS	%
All RAG	153,462	9.4
Mostly RAG	911,773	55.6
gums NRA	256,095	15.6
NRA swd	318,633	19.4
TOTALS	1,639,965	100.0

Global sources of tropical seaweeds and seaweed products

Most current tropical seaweed production was used as raw material for making the red algal galactan (RAG) hydrocolloids known as carrageenan and agar. The most commonly cultivated red algal galactan seaweeds (RAGS) were of the genera Kappaphycus (cottonii of the trade); Eucheuma (spinosum of the trade) and Gracilaria. These were, respectively, sources of kappa-carrageenan, iota-carrageenan and agar.

Gracilaria is a genus with many species and these are distributed widely throughout both tropical and temperate seashores. Official data concerning Gracilaria production were sparse. Commercial trading patterns suggested that most production of cultivated Gracilaria was from Indonesia and China where it was mostly used for production of domestically consumed agar. Chile was also a major Gracilaria producer.

Cultivation of Kappaphycus and/or Eucheuma was known to have been attempted or successfully undertaken in at least 29 countries. An analysis of official import data from 2002-2006 for 34 countries active in the seaweed and hydrocolloid trades showed that 19 were sources of seaweed and seaweed products. The Coral Triangle accounted for almost 86% of volume and 85% of value of tropical seaplant production. Official export data from Indonesia, Malaysia and the Philippines showed that import data from the basket of countries included in the study accounted for 82% of reported export volume and 67% of reported export value from 2002-2006.

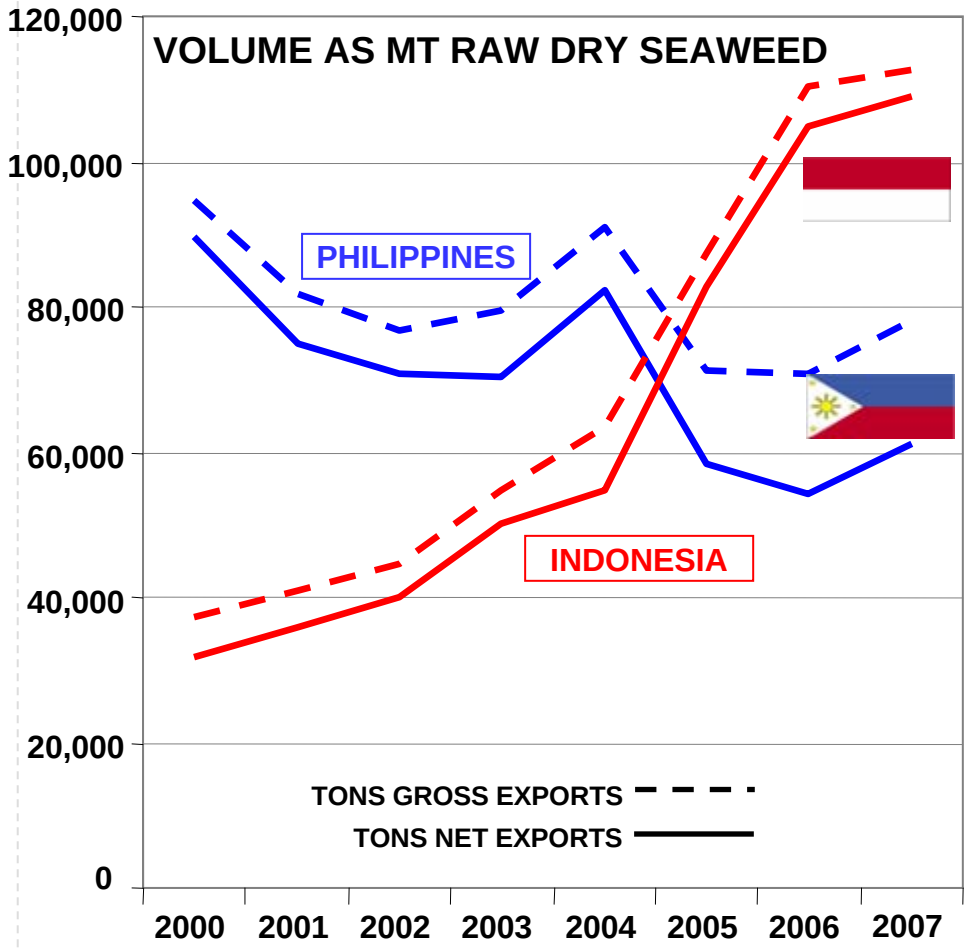
The period 2000-2006 was characterized by tight supplies of Kappaphycus but adequate supplies of Eucheuma and Gracilaria. Estimates of seaweed production in support of exports from the Coral Triangle indicated that by 2007 Indonesia production was about 110,000 dry tons and 2007 Philippine production was about 70,000 dry tons. Most of this was Kappaphycus.

Tropical countries known to have been sources of seaweed and seaweed hydrocolloids from 2002-2006. Note that Fiji was known to have exported some Kappaphycus during the reporting period but that did not show up in these statistics. Also India was known to have exported several hundred tons of Kappaphycus since 2003 but these shipments were lumped with other products in the customs data so exact quantities were not known.

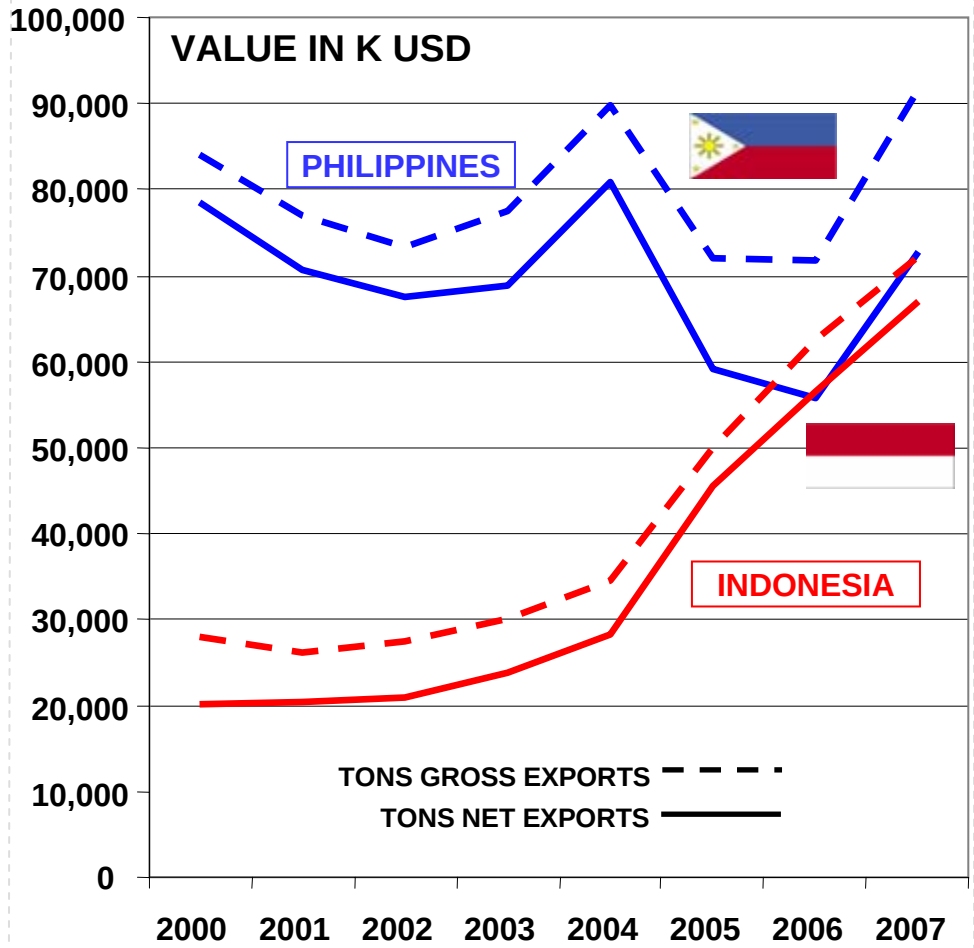
SOURCE	TOTAL TONS	% TONS	SOURCE	K USD CIF	% USD CIF
Indonesia	238,734	49.2	Philippines	251,605	51.2
Philippines	170,564	35.2	Indonesia	151,273	30.8
Tanzania	29,756	6.1	Taiwan	30,091	6.1
Peru	14,278	2.9	Malaysia	14,302	2.9
Vietnam	8,292	1.7	Peru	12,343	2.5
Malaysia	5,369	1.1	Tanzania	11,392	2.3
Thailand	5,191	1.1	Thailand	7,526	1.5
Cambodia	3,451	0.7	Tonga	3,144	0.6
Taiwan	2,553	0.5	Vietnam	3,128	0.6
Madagascar	2,365	0.5	Cambodia	2,165	0.4
Tonga	2,061	0.4	Madagascar	1,454	0.3
Kiribati	576	0.1	Brazil	1,139	0.2
Brazil	532	0.1	Senegal	554	0.1
Solomon Islands	471	0.1	Namibia	479	0.1
Namibia	374	0.1	Solomon Islands	358	0.1
Senegal	161	0.0	Kiribati	346	0.1
Dominican Republic	57	0.0	Cuba	339	0.1
Sri Lanka	44	0.0	Dominican Republic	73	0.0
Cuba	18	0.0	Sri Lanka	67	0.0
	484,850			**491,776**	

Indonesia and Philippine 2000-2007 exports of RAGS products (raw dry seaweed basis)

Indonesia, Philippines gross and net exports as tons of raw, dried seaweed (2000-2007).



Indonesia, and Philippines gross and net exports in thousands of USD (2000-2007)



Trade flows among Indonesia, the Philippines, China and Hong Kong

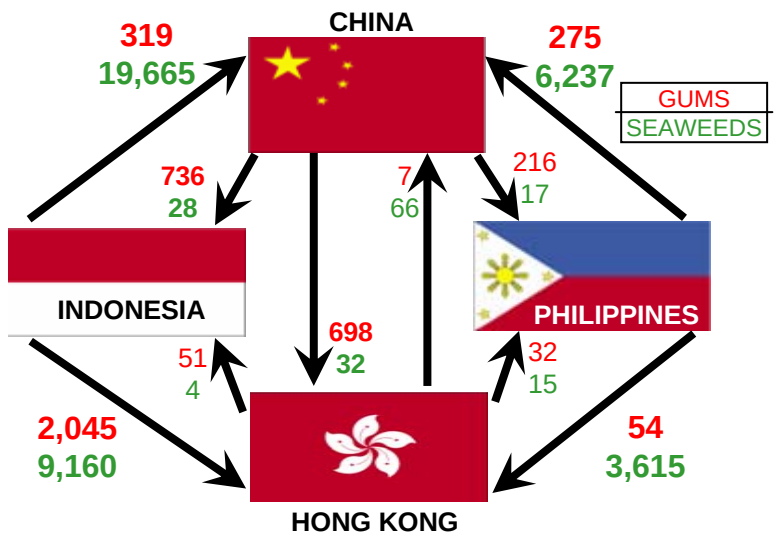
1. For BIMP-EAGA by far the largest flow of RAGS seaweeds from 2000-2006 was to China and Hong Kong.

2. Although records of RAGS seaweeds moving into China from Hong Kong were scanty, industry intelligence indicated that most Hong Kong seaweed imports did, indeed, end up being processed in China

3. Most China imports were of seaweed, not gums.

3. Processed gum exports from China were mostly agar to Indonesia.

Trade patterns of Indonesia and the Philippines with China and Hong Kong (2001-2006).



Data were average annual export tons for customs categories designated as gums and seaweeds.

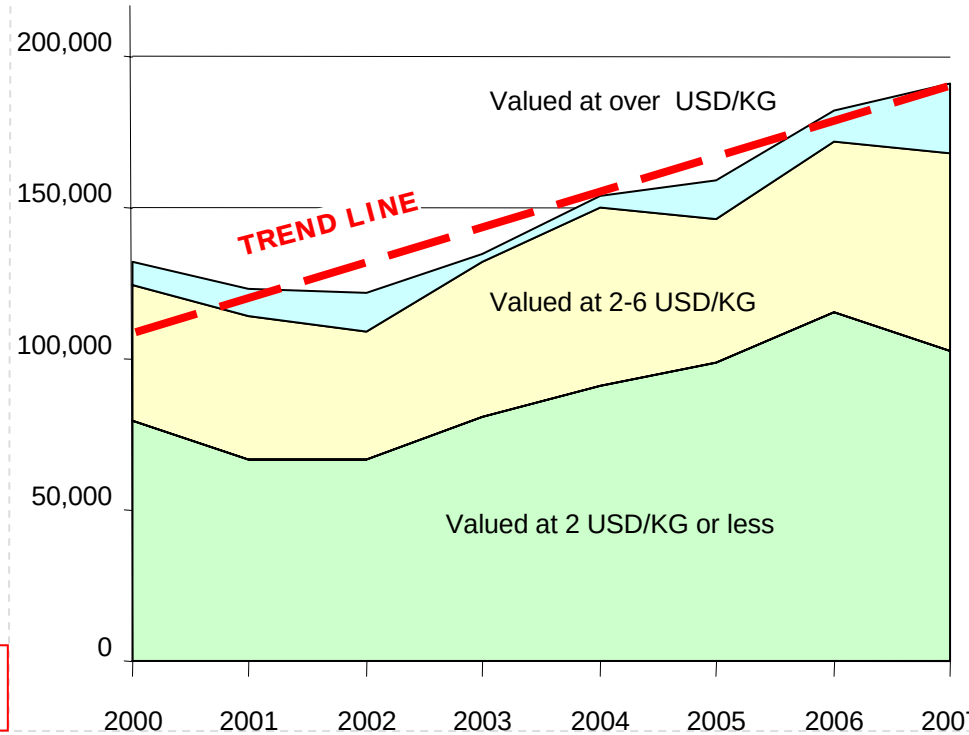
Market growth from 2002-2007

1. The figure below shows total recorded 2000 – 2007 exports (converted to raw, dry seaweed basis) from Indonesia and the Philippines for three declared-value categories.

2. The general trend showed a RDS production increase from about 110,000 tons/annum to about 190,000 tons/annum over the 8 year period for an annual average increase of about 10,000 tons/annum.

3. Over the study period there was a notable increase in the proportion of exports shipped as value-added gums rather than as raw seaweed.

Growth in annual tonnage of RAGS seaweed and gum exports from Indonesia + the Philippines (2000-2007).



Projected market growth from 2007-2012

1. There was evidence from in-house studies of SEAPlant.net and in studies done for IFC Advisory Services that the RAGS seaweed supply – especially for kappa carrageenan - was inadequate to meet probable demand for the study period.

2. Based on models developed for the China market and on trade data included in the present study SEAPlant.net has made projections for the overall RAGS gums market. The results are shown in this figure.

3. This projection indicated a projected doubling in the requirement for RAGS seaweed raw materials over the next five years.

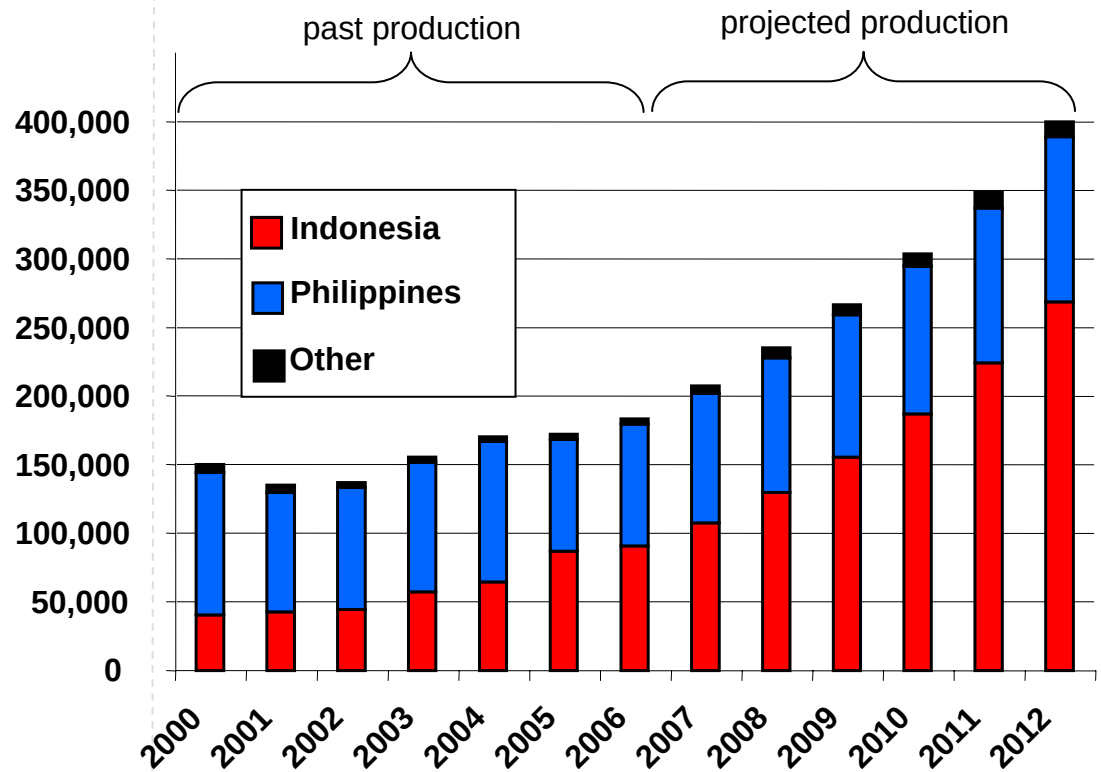
4. Most of this requirement is expected to be for sources of agar and kappa carrageenan that can be made in semi-refined or gel-press process facilities.

5. Based on trends since 2000 and also based on value-chain studies that SEAPlant.net has been involved with it appeared that most of this increase is likely to be generated from Indonesia.

6. Perceived cottonii supply shortages during 2008 and the resultant chaotic pricing will probably cause all major buyers to examine their value chain strategies.

7. The 2008 cottonii value chain failures may combine with carrageenan regulatory issues and with resistance to the introduction of cottonii to non-indigenous locations to negatively impact the projections show here.

Past and projected growth in global markets for tropical RAGS seaweed and gum products – especially agar and kappa carrageenan.



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