Toward Inclusive Dialogue for Sustainable Sea Cucumber Conservation in Malaysia*

AKAMINE Jun
Institute for the Study of Global Issues
Hitotsubashi University
akamine.jun@r.hit-u.ac.jp

1 Introduction

A growing concern over biodiversity and environmental conservation is causing some cultures to abandon wildlife as their food resources. From Asian culinary perspectives, the harvest of such wild animals as whale, tuna, shark, and sea cucumber has provoked concern. For example, international conventions such as IWC (International Whaling Commission) and CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora) have attempted to regulate the harvest and international trade of those wildlife as part of their conservation programs.

This phenomenon known as "environmentalism" has become globally conspicuous after 1970s, where elephants played symbolic roles for conservation. The current environmentalism shows a greater interest in conservation of marine environment and marine life. While most of the wildlife, as elephant being a notable example, were not consumed as food, some species of marine life currently attracting environmentalist' attention could be food and some of them, such as whales, sharks, seahorses, and sea cucumbers, have long history of exploitation in Asia. Some marine animals such as whales have been distributed and consumed domestically especially in Japan, but the other resources, such as sharks and sea cucumbers in particular have been exported from neighboring countries into China at least for three hundred years.

I have been involved in debates on conservations of commercially exploited aquatic species (CEAS) at the CITES and FAO (Food and Agriculture Organization of the United Nations) since 2003. Through attending those international conferences and

experts meeting, I have noticed that wildlife conservations become a highly political issue but not a pure scientific matter. Parties with a stake in the sustainable use of wildlife have found it increasingly difficult to discuss the matter calmly and on scientific grounds, especially when animal protection activists enter the debate. These activists often criticize conventional relationships between human beings and animals, including wild animals, livestock, and pets. For example, CITES has held conferences of the parties (CoPs) as part of its open debates on *ecopolitics*; at the conferences, it is not unusual for individual stakeholders to clash with one another. A term "ecopolitics" here is temporally defined as "dynamics evolved through interaction between various stakeholders who hold vested interests such as government, IGOs, NGOs, traders, and consumers." Such perspective assists in better understanding that environmentalism has become a political issue after the end of the Cold War in the early 1990s [AKAMINE 2013].

Having shared such political background, the present report will first introduce my interest in this topic: history of sea cucumber use cultures in Asia and its present day conservation. The second section of the report will examine how the environmentalism transformed its conservation concerns from terrestrial wildlife into marine species, taking examples of the CITES and IUCN. In this section, I would like to show the inconsistency between science and politics. The article will thirdly illustrate and describe new trends in conservation effort observed in Malaysia based on my fieldwork from August 2013 to August 2014: (1) a culture of wild sea cucumber juveniles into matured ones in their pens (*pagar* in local Bajau language or *sangkar* in Bahasa Malaysia) in Kudat/Pitas areas, Sabah and (2) developing inedible health and cosmetic products such as soaps and lotions from sea cucumber extracts in Kota Kinabalu, Sabah and Langkawi Island (Kedah). These two phenomena share a common feature: *value addition*. Then the article will compare Malaysian case with cases in other Southeast Asian nations and will identify future research topics in Southeast Asian studies.

2 Background of my research project

In November 2002, the CITES (Convention on International Trades in Endangered

Species of Wild Flora and Fauna) issue came out. Debates on sea cucumber conservation at the CITES started in its CoP12 [CoP12 Doc. 45]. As a social scientist, I was involved in conservation issue, attending many international conferences by FAO (Food and Agriculture Organization of the United Nations) and the CITES [AKAMINE 2005b, 2009]. Through these experiences, I understood that environmental issues were highly political. I became conscious of the *multi-sited approach* [MARCUS 1995] being applied to sea cucumber issues; (1) focusing on an overview of global commodity chains from production sites, transport and distribution section, and consumption sites, and (2) observing international intervention in sea cucumber conservation as one of my important *fields/sites*, and (3) trying to collaborate with many different actors, from fishermen, traders, NGO workers, bureaucrats, to scientists, etc. if possible [AKAMINE 2004, 2007, 2013].

Global concerns for sea cucumber exploitation are not just a matter of fishermen's attitudes towards their "unsustainable" or "unregulated" fishing activities. This is a matter of how human beings share marine food resources and conserve biodiversity as well as cultural diversities in the world. Foodways is a complex system that has been cultivated and developed through interaction between ecology and human behaviors against it. Thus, foodways can indicate what we are and how we live and could provide us a new perspective in looking into a society.

3 Evolution of trends in commercially exploited aquatic species (CEAS) management within CITES

CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora) is an international convention, which came into effect in 1975 and has been under the UNEP (United Nations Environmental Program) management. CITES regulates the international trade of threatened wildlife species to protect them "endangered". Its executive office is based in Geneva, Switzerland. As of August 31, 2014, there are 180 parties.

Most global environmental agreements, such as the CBD (Convention on Biological

Diversity), merely specify their purposes and frameworks, and individual problems are dealt with by technical committees and working groups. A characteristic of CITES is that target species are specified in the appendix of the convention. According to CITES, species fall into one of three categories according to the degree to which the species are in danger of extinction, and different management is specified for each category. Appendix I includes species threatened with extinction. Appendix I lists elephants, tigers, gorillas, and other such large mammals which visitors to a zoo typically admire. Trade in specimens of these species is permitted only in exceptional circumstances. The species listed in Appendix II are not necessarily threatened with extinction, but trade in these species must be controlled in order to avoid utilization incompatible with their survival. In order to export species listed in Appendix II, the exporter must first obtain an export permit issued by the management authority of the state of export. In order to add or delete a species in Appendix I or II, the Conference of the Parties must obtain more than a two-thirds majority, excluding blank votes. In Appendix III, signatory parties can list species whose trade is banned or restricted domestically in order to solicit cooperation from other countries. However, Appendix III is not so effective, because voting is not conducted at CoPs.

The word 'protection' has two meanings: that of "conservation" and "preservation." These two meanings differ significantly from each other regarding the degree of human intervention implied. Conservation means "efficient use," as in *conserve water* and *conserve energy*. By contrast, preservation means "maintenance of the original state" or "avoidance of damage," as in *preserve historic landmarks*. The latter term implies as much absent as possible of human intervention. My position is, of course, for sustainable use of wildlife, meaning conservation. Today, debates at CITES seem to put more weights on "biodiversity preservation" rather than the "sustainable use of wildlife," which was the organization's original objective in 1973. This is simply because CITES is in the middle of *ecopolitical* struggle between preservationists and conservationist.

According to the CITES website, about 5,600 animals are under the control of CITES as of September 30, 2014. Among them are 22 families, 27 genera, and 105 species of fish, listed in Appendices I and II (and summarized here in **Table 1**). The overall number of fish species is not large, but if analyzed over a time series, the list becomes more

interesting. A Japanese conservation ecologist Kaneko Yoshio, who had working experience in the CITES secretariat, has done this and has elucidated an important characteristic of the list as expressed in **Table 2**. He points out that (1) at the time of the CITES enforcement in 1975, the fish species listed in Appendix I or II were all (except for the coelacanths) freshwater fish and (2) this tendency continued throughout the 1990s, leading to (3) the unmistakable conclusion that CITES started managing marine fish after CoP12 in 2002 [KANEKO 2010].

A good reference for this subject is the summary report of CoP12 in the *Earth Negotiations Bulletin* (*ENB*) published by the NGO International Institute for Sustainable Development (IISD), which reports on the processes of multilateral negotiations regarding environments and sustainable development in which the UN engages. Under the title "Marine Species Make a Splash," the *ENB* mentions that "CITES has traditionally avoided discussing marine species, preferring to defer whale issues to the International Whaling Commission (IWC) and fish-related issues to the Food and Agriculture Organization (FAO). But, the listing of basking and whale sharks, and seahorses in Appendix II broke this trend, signaling that marine species were becoming increasingly important for CITES protection" [ENB 21(30): 15].

As the *ENB* predicted, at the CoP13 in 2004, two marine species, the great white shark and the humphead wrasse were included in Appendix II, as shown in Table 2. At the following CoP14 in 2007, the World Wild Fund for Nature (WWF), which is the largest environmental NGO in the world, enumerated 10 target species, and half of them were marine species. The CoP rejected all of them, but the proposals for revisions to appendices discussed at CoP15 held in Doha, Qatar in March 2010 included 9 species of fish (8 sharks and 1 bluefin tuna). On the other hand, the CoP16 held in Bangkok in March 2013, 9 sharks and rays were listed in Appendix II of the Convention. The *ENB* thus describes the CoP12 in 2002 as "the turning point of CITES," and that marine organisms subject to CITES, especially commercially exploited species, are attracting more and more attention.

As seen from Table 2, sharks and rays (Elasmobranchii) currently attract most attention at the CITES. Needless to say, shark fin is one of the must items in Chinese "traditional"

banquet. Among fish listed in CITES Appendix I and II, humphead wrasse or Napoleon fish (*Cheilinus undulates*) and seahorses are also consumed mainly by Chinese. Sea cucumbers share similar characteristics in Chinese foodways.

The sea cucumber market is China and its diaspora communities but production sites globally scatter. Neighboring countries such as Japan and those in Southeast Asian started to harvest sea cucumbers for export to China at the end of 17th century. South Pacific islands followed this [WARD 1972]. They began to process dried sea cucumbers in the 18th century [WARREN 1981]. In the late 1980s, sea cucumber production expanded to South America and African countries. In the middle of 1995, environmentalists began to show their concerns for sea cucumber fisheries in the world. Then sea cucumbers became the CITES agenda at the CoP12 in 2002. From then on until the CoP16 in March 2013, debates on sea cucumber conservation continued and the Parties finally agreed that each party should be responsible for the management of sea cucumber [AC26 DG1 Doc. 1, CoP16 Doc.64 (Rev. 1)].

This conclusion put an end to CITES's intervention in sea cucumber management. However, in July of the same year (2013), the IUCN (International Union for Conservation of Nature) announced sixteen (16) species, out of 371 reviewed, of sea cucumbers in the world were at the risk of threatened: 7 EN; 9 VU; 109 LC; 246 DD. Among them, ten (10) live in Southeast Asian tropical waters as shown in **Table 3**. A structure of IUCN's threatened category is summarized in **Figure 1**.

There are no direct connection between listing in the CITES Appendix and IUCN Red List as shown in **Table 4**, which may probably indicate inconsistency between environmental politics and pure scientific research.

We should bear in mind that the IUCN nominates five Southeast Asian species as EN. Among such species are *H. lessoni* and *H. scabra* commonly harvested in Sabah (as shown in the next section). The main species used for making sea cucumber products in Langkawi Island is *S. hermanni* and the IUCN considers it VU. Needless to say, whether it is listed or not in the CITES Appendices, conservation of sea cucumbers should be top priority for making our cultural heritage and diversities sustainable.

4 Changes in Kota Kinabalu (KK)'s sea cucumber retail market

I have been investigating dried marine product specialty shops (DMPSS) in Southeast Asia, especially the Philippines and Indonesia for the last 18 years [AKAMINE 2001, 2002, 2005a]. I will describe the characteristics observed in Kota Kinabalu, that is probably different from other major cities in Southeast Asia below.

(1) Not a few Malays (including former Philippine origin residents) own such DMPSS and only a few Chinese own the similar DMPSS. In almost every major cities in Southeast Asia those DMPSS are a kind of monopoly by Chinese. It seems quite reasonable because those dried marine products have been exclusively consumed by Chinese and thus Chinese traders are in advantageous positions. However, many Malays have entered the dried marine product business, which is the first unique point in Kota Kinabalu.

(2) Further more, there are two drastic differences between Malay and Chinese DMPSS. The Malays sell frozen seafood such as groupers and lobsters, which "traditional" Chinese DMPSS never do. Also, Malay DMPSS sell sea cucumber soap (*sabun gamat*) together with other "traditional" dried marine products such as shark fins, sea cucumbers, and fish maws.

The phenomenon in which the Malays make inroads into the traditional Chinese food market is noteworthy because DMPSS had been under Chinese monopoly. Only one exception I know of is Indonesian Bugis cases in eastern Indonesian archipelago where Bugis merchants are competing with Chinese businessmen to buy and sell these dried marine products. According to an Indonesian Chinese businessman whom I interviewed at Makassar in Sulawesi in 2005, he found it yielding little profit because of high cost price of sea cucumbers and having better to invest other kinds of business instead. As of now I have no particular reason in mind and examine closely, but one thing to be pointed out here is that most of the materials sold in KK market are imported from the

Philippines or from Indonesia through Tausug or Bugis merchants and former Philippine or Indonesian Malay merchants may have easy access to those networks.

Photo 1(Left): Sabah Natural Soap and Dry Seafood Center, Kota Kinabalu.
Photo 2 (Right): Borneo Frozen & Dried Seafood, Kota Kinabalu.

(3) On the other hand, many Chinese run general "Borneo" souvenir shops that sell dried *H. scabra* (sandfish) and *H. lessoni* (golden sandfish), birds nest, fish maws, cuttlefish cookies, Tongkat ali, Sabah tea, Sabah coffee, honey, durian chips and related products, peppers from Sarawak, cosmetic coconut oils flavored with native plants, and sea cucumber soap, etc. To the best of my memory, this kind of souvenir shops did not exist in early 2000s when I traveled in Sabah and thus seem rather new phenomena. I interviewed some of them and was informed that and they started their business only a few years ago. Moreover, there are more new souvenir shops opened between March 2014 and August 2014. Usually, such Chinese souvenir shops sell dried sea cucumbers with high commercial value such as *Holothuria scabra* or *H. lessoni* (formally called *H. scabra* var. *versicolor*) as well as sea cucumber soaps. Those dried sandfish are in very good condition both in size and in quality. They come mainly from Kudat/Pitas area, especially, Tigabu Island, Jambongan Island and Kalibungan in Pitas.

How and why did such souvenir shops emerge? One possible reason would be that they target Chinese tourists. KK currently prospers with tourists from mainland China, Hong Kong, or Taiwan with the help of Air Asia's direct flights to Chinese cities. When Chinese tourists look for their souvenirs from Borneo, they go for Chinese souvenir shops. They are able to buy everything they want from local sweets, traditional dried marine products, traditional herbal medicines to health and cosmetic products. Such Chinese souvenir shops may have been a response to (1) many Chinese tourists visiting KK and (2) Malays' inroads to the Chinese "traditional" dried marine goods business.

(4) Health and cosmetic (HC) products made from sea cucumber extracts are commonly sold in KK in both Malay DMPSS and Chinese Borneo souvenir shops. Among ingredients of sea cucumbers, four substances could be useful for human body: saponin, collagen, ceramide, and Cuvierian tubules [PURCELL et al. 2014]. These are considered to be effective in water retention for skin, regeneration of skin tissue, and anti-fungus agent to skin. Among these substances, only saponin is water-soluble and the others oil-soluble. To absorb all of four kinds of substances, manufactures have to mix with water- and oil- soluble measures.

As far as I surveyed the souvenir shops and DMPSS in KK in February 2014, there were at least seven local brands of sea cucumber soaps available. Some companies produce more than one kind of sea cucumber soap varieties. They specialize in the soap that contains *natural* herbal ingredients and is hand-made. Aside from sea cucumber soap, soap with other kinds of flavor such as ginger, turmeric, lemon grass, cinnamon, mangosteen, etc., are plenty in souvenir shops. The price is around RM6 to 10 per piece depending on the brands (RM1 is equal to USD0.32 at the time of writing). Most of them are beautifully packaged with batik wrapped. According to a souvenir shop owner, local Malay people buy them and Japanese and Korean tourists prefer such items as their souvenir. The Japanese tourists whom I interviewed knew the sea cucumber soap before they came to Sabah and they bought 10 to 20 pieces at one time. Some are for home consumption for themselves and some for giving away as gifts to their friends.

Photo 3: Borneo Natural Handmade Soap.

5 Wild sea cucumber farming in Pulau Tigabu, Pitas, Sabah

Pulau Tigabu looks like an ordinary remote island in Southeast Asia whose majority is Bajau Ubian (descendants from the Philippines' South Ubian Island in eastern Tawi-Tawi islands). According to the village head (*kutua kampong*), almost all 116 households own their own fish pen (*pagar*). They harvest wild *bibid gamat* (sea cucumber fry) at around Kalibungan or Jambongan. They can buy the wild juveniles for RM0.3 to RM2 per piece depending on the size. Normally, a fry of the size of the thumb cost RM0.5. It normally takes 10 to 12 months before harvesting. When the juveniles grow large enough, it costs from RM8 to RM10 per piece. They can feed cassava to sandfish but normally they do not provide any bait for sandfish. After harvest of the farmed sandfish, the bed of the pens should be swept up.

Pagar is made of dead stony corals and giant clam shells. Usually wall of the pen is 30 to 50 cm high and 30 to 50 cm width. Size of *pagar* changes and no particular regulation exists. For example, Kutua Kampong's *pagar* is an equilateral triangle like shape with each base has about 25 meter long. He puts 1000 *ekor* of juvenile sandfish.

According to the Kutua Kampong, When the juveniles are as small enough as the first knuckle of the little finger, fish eats them. About 10% of the initial inputs normally die before harvest.

Photo 4: Pen for sandfish at Tigabu Island.

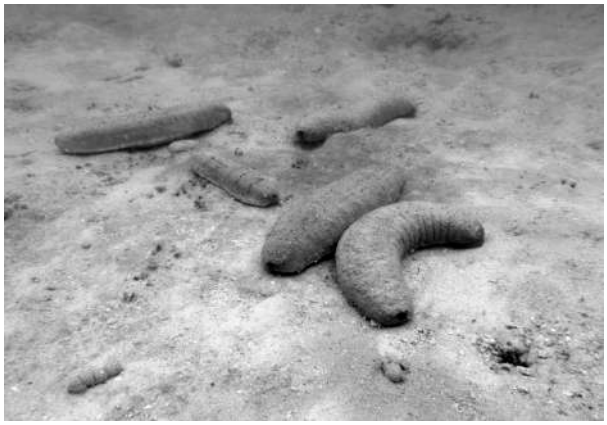

Photo 5: Sandfish in the pen at Tigabu Island.

Most of the residents process their sandfish before selling to merchants in KK. They first gut intestines and put them into salt for four days. Then they boil them for about two hours. After boiling sea cucumbers should be sun dried for five to six days before shipment. I observed a man processing his sandfish. He was clearing surface covered by calcium skin with iron brush. It took him five to six minutes to clean one piece of cooked specimen. This cleaning process is important to value addition to the final products. If the final products still remain calcium skin in part, they will get lower commercial value. According to him, it is difficult to clear the calcium skin if sea cucumber is too small. He pointed that the size of sea cucumbers should be as large as

his fist. His final dried products weigh about from 30 g to 40g per piece. He normally sells his product at KK around RM350 per kilogram. His products may contain some moisture but such size of well-dried sandfish at KK cost RM700 to RM800 per kg. **Table 5** shows a retail price of fully dried *H. scabra* at a major DMPSS in KK based on my interview.

6 Preliminary observation of sea cucumber industry in Langkawi Island

Langkawi Island is famous for sea cucumber products such as *minyak gamat* (sea cucumber oil) among the Malays. The Malays in Malay Peninsula take *air gamat* (sea cucumber water) for curing their internal disorder. The *gamat* here refers to only *Stichopus herrmanni* (curry fish) and *S. horrens* (warty sea cucumber). In Langakwi, they do not exploit other kinds of sea cucumbers but they only "traditionally" utilize those *Stichopus* spp.

Minyak, balm, and gel (not *sabun*) are the popular products among the Malay manufactures and sellers in Langakawi. However, currently young generation prefers gel to *minyak* and one of the manufactures tries to strengthen sales of different types of gels.

When the manufactures make *minyak gamat*, they usually put 3 kg of dried *Stichopus herrmanni* into 80 little of palm oil (They used to use home-made coconut oil). They usually heat the cauldron with a medium flame for three to four days until dried sea cucumbers dissolved. Some manufactures prefer firewood and the other gas for boiling. If they use firewood, they can expect remaining heat. There seems nothing secret for boiling dried sea cucumbers with oil. If there is any secret in their products, it would be in other ingredients. Manufactures compete with blending herbs to make their products more attractive. A manufacture in Langkawi told me he used 70 species of herbs.

Photo 6: Typical *gamat* manufacture's sales shop in Langakwi Island.

It was a "traditional" kampong business in Langkawi, especially Padang Matsirat and Kuala Teriang districts. After Langkawi became a duty free port in January 1987, many people came to the island and got to know *minyak gamat*, resulting in making *minyak gamat* popular nationwide in Malaysia. As news and anecdotes that *gamat* is healthy spread widely, new products such as *kopi gamat* with *tongkat ali* or *biskut gamat* have appeared in the market.

Photo 7: *Gamat* coffee with *tongkat ali*.

Sea cucumber soap is one of such items that sells well as special souvenir from Langakwi Island for foreigners. A Japanese woman opened a souvenir shop in 1997 and she tried to attract young Japanese female tourists by packaging with beautiful batik wrap. She used to work at travel industry in Japan and had experiences in European

souvenir business. She is well acquainted with Japanese tastes, too. She has long been nursing the idea for her own souvenir shop in Langakwi. Thus, her souvenir shop is well coordinated with native crafts such as Langkawi batik and bags and clothes. Her shop has a relaxed and sophisticated atmosphere that appeals to Japanese customers. In fact, her shop is famous in Japan through Internet and magazines.

Photo 8: A Japanese souvenir shop at Langkawi.

7 Further study needed

For conservation matter, we should be careful about how healthy is wild juveniles stocks of *H. scabra/lessoni* in Kudat/Pitas area. Unfortunately, there is no scientific research conducted regarding this question. If inputs of wild juvenile are plenty and healthy enough, farming of *H. scabra/lessoni* in *pagar* in kudat/Pitas region would be sustainable and promising. Fishermen could profit more to sell larger specimens than small ones. It could be a good model for high commercial value *H. scabra/lessoni* fisheries in Southeast Asia, even in South Pacific and Indian Ocean nations.

Expanding *gamat* market in Malaysia and abroad, with new products coming in, is most welcomed in developing perspective. But at the same time we need to be careful about their resource conditions. Many soap and *minyak* manufactures in Langkawi told me that they depend on imported *gamat* from Thailand for their primary materials. No manufactures can produce their *gamat* products without supplies from Thailand because local *gamat* supply is very scarce. Malaysian Fisheries Agency currently is working hard for seedling *gamat*. However it is not successful at the commercial level.

As for health and cosmetic products, other sea cucumber species could take place *S. hermanni/horrens*. For example, I encountered one manufacture of *gamat* soap in KK; he emphasized "Species matter less. Most important thing is how to dissolve as much sea cucumber's essence to oil as possible." If other than *S. hermanni/horresn* can produce sea cucumber health/cosmetic products, it can greatly help resolve *gamat* exploitation in Langkawi in general.

The Malays in Malay Peninsula inherit a "tradition" to use sea cucumber as local medicines especially for skin diseases. This makes Malaysia very unique among Southeast Asian countries. Moreover, the Malays in Langkawi in particular takes sea cucumbers for curing inner problems as a form of *air gamat* (sea cucumber water) and eating their cooked bodies as well as raw sexual gonads. Historical root of sea cucumber used in Malay Peninsular, or in Langkawi particular, is yet to be investigated.

Development of sea cucumber health and cosmetic products in Sabah is probably a recent event. Many manufactures have started to produce their sea cucumber products four or five years ago (around year 2010). I have yet to make clear the reason sea cucumber health products market suddenly emerged in Sabah. I suspect that manufactures from Langkawi got in contact with those in Sabah in their search of sea cucumber supplies from Sabah and Sabah manufactures would have felt business chances of *gamat* products.

Interestingly enough, there seems no tendency to produce sea cucumber soap in other resort areas in Southeast Asia such as Bali, Cebu, and Phuket though they promote "spa-tourism" and already sell various kinds of herbal and fruit flavor soaps. According

to a Japanese souvenir shop owner in Langkawi Island, there were some inquires on her sea cucumber soap from Indonesia and the Philippines. However she rejected those business offers. She likes to stick to "made in Langkawi" brand. In addition, she has her own capacity for producing good quality hand-made soap that she satisfies herself. If she exports her soap to the Philippines or Indonesia, it would go beyond her capacity.

In Southeast Asia, consuming sea cucumbers is few. Bajau is one of those groups who eat sea cucumbers as well as their intestines and sexual gonads. However, if we look at the South Pacific region, many islanders consume raw sea cucumbers. From this point, we need to extend our Southeast Asian perspective to cover South Pacific waters. Langkawi is facing Indian Ocean and Thailand and Myanmar are a short distance away. Naturally sea cucumber used in Langakwi may have been related to maritime cultures in Indian Ocean region. Thus, cross-regional/multi-sited research on sea cucumber products is necessary to overview sea cucumber cultures and proper interpret its dynamic history in maritime Southeast Asia.

Notes

*Main contents of the present article were partially presented as (1) "Conserving marine biodiversity for cultural diversity: A case for sea cucumbers among Bajau societies," The 12th Borneo Research Council (BCR2014), Universiti Malaysia Sabah, August 5, 2014, and (2) "Potential for sustainable use of sea cucumbers in Malaysia," special lecture in series of the LESTARI's 20th anniversary, LESTARI (Institute for Environment and Development), Universiti Kebangsaan Malayasia, August 28, 2014.

References

AKAMINE, Jun, 2001. "Holothurian exploitation in the Philippines: Continuities and discontinuities," *TROPICS* 10(4): 591-607.

AKAMINE, Jun, 2002. "Trepang exploitation in the Philippines: Updated information," *SPC Beche-de-mer Information Bulletin* 17: 17-21.

AKAMINE, Jun, 2004. "The status of sea cucumber fisheries and trade in Japan: Past and present," in LOVATELLI, Alessandro, Chantal CONAND, Steven PURCELL, Sven UTHICKE, Jean-Francois HAMEL, Annie MERCIER eds, *Advances in Sea Cucumber Aquaculture and Management*, FAO fisheries technical paper series 463, Rome: FAO, 425pp., pp. 39-47.

AKAMINE, Jun, 2005a. "Role of the trepang traders in the depleting resource management," *Senri Ethnographical Studies* 67: 259-278.

AKAMINE, Jun, 2005b. "International intervention is not the only way to save depleting resources," *Journal of Chinese Dietary Culture* 1(2): 1-30.

AKAMINE, Jun, 2007. "Namako and iriko: Historical overview on holothuria (sea cucumber) exploitation, management and trade in Japan," in CHEUNG, Sidney, and Chee-Beng TAN eds, *Food and Foodways in Asia*: *Resource, Tradition and Cooking*, London: Routledge, 215pp., pp. 23-36.

AKAMINE, Jun, 2009. "Challenging 'boom and bust' market pressures: Development of self-managed sea cucumber conservation in Rishiri Island, Hokkaido, Japan," *Biosphere Conservation* 9(2): 1-12.

AKAMINE, Jun, 2010. “Trepang and lalipan: A linguistic note towards the reconstruction of social history of maritime Southeast Asia,” *Hakusan Review of Anthropology* 13: 35-41.
AKAMINE, Jun, 2013. *Conserving Biodiversity for Cultural Diversity: A Multi-sited Ethnography of Sea Cucumber Wars,* Hadano: Tokai University Press, pp. 286.
ANIMALS COMMITTEE, CITES, 2012. “SEA CUCUMBERS [DECISION 14.100 (REV. COP15)] (Agenda item 19) AC26 DG1 DOC. 1.
ANIMALS COMMITTEE, CITES, 2016. “Species trade and conservation, SEA CUCUMBERS.” COP16 DOC.64 (REV. 1), 2pp.
INTERNATIONAL INSTITUTE FOR SUSTAINABLE DEVELOPMENT (IISD), 2002. *Earth Negotiations Bulletin* 21(30).
INTERNATIONAL UNION FOR CONSERVATION OF NATURE (IUCN), 2012. *IUCN Red List Categories and Criteria Version 3.1*, 2nd edn. Gland, Switzerland: IUCN, 32pp.
KANEKO, Yoshio, 2010. “Current trends in CITES of fishery resource,” *Fisheries Science* 76(2): 263-264.
MARCUS, George E., 1995. “Ethnography in/of the World System: The Emergence of Multi-sited Ethnography,” *Annual Review of Anthropology* 24: 95-117.
PURCELL, Steven, Poh Sze CHOO, Jun AKAMINE, and Michael FABINYI, 2014. “Alternative product forms, consumer packaging and extracted derivatives of tropical sea cucumbers,” *SPC Beche-de-mer Information Bulletin* 34: 47-52.
UNITED STATES OF AMERICA, 2002. Interpretation and implementation of the Convention Species trade and conservation issues: TRADE IN SEA CUCUMBERS IN THE FAMILIES HOLOTHURIDAE AND STIC HOPODIDAE (CoP12 Doc. 45), 28pp.
WARD, R.G. 1972. “The Pacific beche-de-mer trade with special reference to Fiji,” in WARD, R.G. ed. *Man in the Pacific islands: Essays on Geographical Change in the Pacific Islands*, Oxford: Oxford University Press, pp. 91-123.
WARREN, James F., 1981. *Sulu Zone: Dynamics of External Trade, Slavery and Ethnicity in the Transformation of a Southeast Asian Maritime State*, Singapore: Singapore University Press, Reprinted by New Day Publishers, Quezon City, 1985.

Acknowledgement

Most of the research for this article was conducted during my stay at Kota Kinabalu from August 2013 to March 2014 as the Nippon Foundation’s API (Asian Public Intellectuals) Fellow (*Pas Penyelidikan #3207*). Fieldwork in Langkawi Island was conducted in August 2014 as part of “Local Communities and International Environmental Regimes” project headed by Prof. Wil de Jong of Kyoto University (JSPS research grant #24310182). I thank the Nippon Foundation to provide me such a wonderful opportunity and Prof. de Jong and JSPS for providing me follow-up research opportunities at Langkawi Island. Also my sincere thanks go to Mr. Mustapa Abdul Talip of UMS (Universiti Malaysia Sabah) and Associate Professor Dr. Ahmad Fariz Mohamed of UKM (Universiti Kebangsaan Malaysia) to accommodate me as a visiting scholar during my API fellowship. *Terima kasih banyak dan magsukul toongan ma kamemon*.

Legend

Table 1: Fish listed in the CITES Appendix I and II (27 genera 105 species).
Tabel 2: Fish listed in the CITES Appendix I and II in chronological order.
Table 3: Southeast Asian sea cucumbers in the IUCN Red List as of 2014.
Table 4: CEAS in the CITES Appendices I/II and their IUCN's evaluation.
Table 5: Retail prices of dried *H. scabra* in KK (Aug. 2014).
Figure 1: Structure of IUCN's threatened category.