

## **SUSTAINABILITY OF SEAWEED FARMING IN SOUTH SULAWESI, INDONESIA**

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### **1.0 INTRODUCTION**

Back in 2008, Indonesia has been producing 214,505.9 metric tons of dried seaweed and it has tripled to 651,485.4 metric tons in year 2012. Significant growth projected Indonesian seaweed will keep growing and gets more productive. However, in 2015 Indonesian seaweed farmers struggled to market the seaweed product as the demand from overseas markets especially China the main importer has slowed down. China which was the main export destination for Indonesian seaweed has ceased the imports and it caused a huge volume of stockpile of the commodity (Andi Hajramurni, 2015).

### **2.0 SEAWEED FARMING INDUSTRY IN INDONESIA**

Indonesian Seaweed Industry Association secretary stated that the significant decline in overseas demand for Indonesian seaweed started in early 2015, and the government of Indonesia must build warehouses in seaweed production centers to store the surplus. For records, Indonesia is the world's biggest producer of seaweed, that produced 10.2 million tons of seaweed, with 30 percent of it exported to foreign markets, while the domestic market can only absorb 40 percent of the national production, leaving the remaining 30 percent unabsorbed. In resolving this matter, Andi Hajramurni (2015) said the government needed to build at least 30 seaweed storage facilities across the archipelago, with each capacity to store 500 tons of seaweed.

### **3.0 PROSPECT AND CHALLENGES**

The price of standard-quality seaweed currently stands between Rp 3,000 (25 US cents) and Rp 3,500 per kilogram. The price was a sharp drop from Rp 9,000 per kilogram earlier this year, while the high-quality seaweed is priced at around Rp 6,00 per kilogram. South Sulawesi is one of the biggest seaweed production centres in Indonesia, with 800,000 tons came from South Sulawesi (Andi Hajramurni, 2015). During the authors' work visits in 2013, 2014, and 2015, seaweed price was at a good mark, ranging from Rp 7,493.21 to Rp 10,490.49<sup>4</sup>. Areas visited were Kecamatan Jeneponto, Kalumpang, and Kebok Kasih of South Sulawesi, Indonesia (Datu Razali, James, Arsiah, and Roslinah, 2015).

After 30 years, seaweed farming is now a fundamental part of livelihood of 200,000 smallholder farmers, and the sale price is \$1,000/ton that keeps farming families above the poverty line. The government of Indonesia has a vision of process more seaweed domestically, create new

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<sup>4</sup> By current conversion rate MYR 2.50 = Rp 7,493.21 and MYR3.50 = Rp 10,490.49

products, and capture more of the value chain (Paul Nicholas, 2016) would be the key start for sustainable development, whereas the next step is to recognize the indirect value of aquaculture for ocean health. Paul Nicholas provides an insight that Australia has not capture that aquaculture has ocean health benefits, as in other economies, aquaculture of filter feeding molluscs are recognized as living resources with value to water quality, as much as Scandinavia values the role of mussels in cleaning the environment and the United States values the role of oyster reefs in treating urban estuaries. He stated further that the concept of integrating the ocean health, technology, and commercialization become comfortable, as some futurist concepts are arguably "mainstream" now, such as the idea of using seaweed to draw down carbon from the atmosphere. Although the scale is a challenge, but the premise founded on the ability of seaweeds to treat the water and create valuable products at the same time. Paul Nicholas provides a consideration here as for every 100,000 tons of dried seaweed produced in Indonesia, the seaweed has removed from the coastal water: 500 tons of nitrogen, 50 tons of phosphorus, and 15,000 tons of carbon (which equals more than 50,000 tons of CO<sub>2</sub> sequestered).

Apart from the scientific sustainable concept of it, the authors have confirmed that the younger the age is more participative the women of Jeneponto are, as the age was found to have an inverse relationship with women participation. Education has negative relationship with women participation, indicated higher education does not increase their employability or perhaps seaweed farming does not require formal learning qualification. Household size has positive coefficient, as the women have larger families the probability of them to participate seaweed farming is higher. From the visit made by the authors all these years, participation in seaweed farming allow women to derive job satisfaction and to be recognized by own peers, and of all sites visited, seaweed farming is a village-wide effort, supported by active family participation.

Vivien Cumming, a freelance journalist specializing in science and the natural world reported that Professor David Smith of the University of Essex, a marine biologist has found that there are 75 percent less fish today than when they start recording in 2002. The reasons stated are due to overfishing, loss of coral cover and multiple reasons too. Smith highlighted that the matter is a global problem, and in low-latitude developing nations like Indonesia, crisis is brewing as more than 17,000 islands and 260 million people, would led to malnutrition. Solution to this probably is seaweed farming.

As of September 2016, Cattonii is priced around Rp 8,000 (USD 59 cents) per kilogram, but historically the price has been volatile. In 2008, prices range from Rp 5,000 to 8,000 before tumbles again to 10,000 (Vivien Cumming, 2016). The Opwall Trust (a UK charity organization) is piloting a plan over the next few years to build a seaweed processing plant in the region, however it would cut out the middleman, as to have the local farmers getting better price for their seaweed. Prof Smith warned that if seaweed farming is to be the answer, it is better to look at the most sustainable ways to manage and farm now rather than wait for expansion, unregulated farming and environmentally degrading processes.

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