

FIJI ISLANDS

INVESTMENT OPPORTUNITIES IN THE SEAWEED INDUSTRY

1.0 INTRODUCTION

The Fiji seaweed industry showed early promise between 1985 and 1990, with a total production of 684.4 metric tonnes. Its highest production was achieved in 2000, totalled 520 tonnes. Given Fiji's wealth of diverse marine resources and its strategic location, Fiji is a natural place for extensive seaweed farming.

Seaweed species that is proven to grow well in Fiji includes *Gracilaria*¹; *Meristotheca procumbens*² (*tosakanori*); *Caulerpa racemosa*³ *sp* (Seagrapes) and *Cladosiphon*⁴ *sp.* (*limu tanga'u*, *mozuku*) and *Kappaphycus alvarezii* (*eucheuma*, *cottoni*). All the species grow naturally within the region except for *Euchema* seaweed species; *Kappaphycus alvarezii*, also known as *Euchema cottonii* which was introduced and cultivated at Tavua in Fiji in 1984 under a New Zealand Biological project. *Kappaphycus alvarezii* has been proven to grow well under local conditions in pristine clean environment, which is an added appeal to products from Fiji.

2.0 RESOURCE BASE

Fiji has a competitive advantage for seaweed farming in terms of the pristine eco system, easy access and abundance of clear marine waters, a better-educated work force, and existence of established distributions links. It is a fast cash crop and takes only 6 – 8 weeks to mature and is the major raw ingredient for the extraction of *carrageenan*⁵, which is widely used in food processing. Seaweed farms of whatever species have at least two beneficial impacts: they can increase local fish populations, by providing shelter and food for herbivorous fishes and act as 'nutrient sinks' that take up inorganic nutrients (ammonia, nitrate, phosphate) from the water.

3.0 INFRASTRUCTURE AVAILABILITY

The farming of *Euchema* seaweed has been widely carried out in Fiji with better growth recorded in the Southern Eastern part of the Fiji Islands particularly in Ono-i-Lau. Low cost technology is used requiring simple equipment and planting method. Farming best suits remote rural locations, particularly the outer islands since basic technology is used and the product is stable after sun-drying requiring no electricity.

¹ *Gracilaria* is a genus of red algae (Rhodophyta). In Japanese cuisine it is called Ogonori or Ogo. In the Philippines it is called Gulaman or Guraman. In Fiji it is called 'Lumi cevata'

² *Meristotheca procumbens* can be eaten (raw or cooked) in other parts of the Pacific; Fiji & Rotuma

³ It is called 'Nama' in Fiji and some species are eaten under the names Sea grape or Green caviar or Umi-budo in Okinawa. They have a peppery taste. Sea grapes are eaten in Indonesia cuisine, sometimes fresh, and other times coated in sugar.

⁴ *Cladosiphon okamuranus* (*Mozuku*) is a type of edible seaweed

⁵ *Carrageenans* are large, highly flexible molecules which curl forming helical structures. This gives them the ability to form a variety of different gels at room temperature. They are widely used in the food and other industries as thickening and stabilizing agents.

Euchema is cultivated inside reefs and inter-tidal sandy lagoons at minimum low tide depths of 2 – 4 feet, to ensure that the plants are covered with cool saline water of between 20 – 28 degrees centigrade all the time as it is prone to heating or high temperatures and runoffs from freshwater inland. As it is at the primary end of the food chain, this seaweed aggregates fish and rabbit fish (nuqa) along with other herbivorous fish are its main predators.

Seed-stock is obtained from cuttings retained after each harvest. Grow-out can be on rope lines and stakes ('off-bottom' method) or nets in shallow back-reef areas, or on floating rafts (e.g. bamboo) in lagoons.

4.0 EXISTING INDUSTRIES

Five seaweed stations are currently in operation and these include Ono – I - Lau, Central Lau (Namuka, Ogea, Fulaga & Moce), Kiuva & Kaba, Macuata and Kadavu. The marketing agent of seaweed, Agro Marketing Authority of Fiji (AMA) buys dried seaweed from seaweed farmers and exports them to overseas markets. There are also other potential seaweed stations within Fiji which include Cakaudrove, Bua, Tailevu Dawasamu, Nakorotubu, Rakiraki Vanuabalavu etc that have not been developed and utilized.

The growing interest and demand from the Chinese markets will revitalize the Seaweed Project to industry status. The availability of markets was the missing link in the early development of seaweed in the 1980s to 1990s and 2000. The increasing interests from Chinese markets and the competitive prices will drive seaweed farming development to a commercial basis. Seaweed production will be market driven now and will be beneficial to all parties concerned, especially to the Seaweed Farmers in the remote rural communities.

5.0 INCENTIVES AVAILABLE

- **Corporate Tax - 28%** for resident and non-resident companies;
- Food processing activities may claim **100% as a deduction** on the amount spent on capital investment. The deduction is available for those new business engaged in value adding process. Re-investment for expansion purposes will also be allowed such a deduction. In order to qualify the investor should utilize 50% of local produce (inclusive of raw materials, labour etc) in its production process; \
- **Investment Allowance - 40 percent deduction** may be claimed on the purchase of capital assets of not less than \$50,000 per annum and provided that the capital asset is not disposed off within 3 years. The capital assets do not include land, buildings, passenger motor vehicle or trading stock. Such investment allowance can be claimed between 2001 and 2010 (both years inclusive) for the expenditures incurred during this period. However, activity should involve substantial transformation⁶ of the natural resources⁷ and the manufacturing⁸ business carried out on a location not less than 25 km from the General Post Office (GPO) in Suva, Lautoka, Nadi, Nausori or Navua;

⁶ Substantial transformation means the process applied to the natural resources, which result in a product having a different classification under the Harmonised System (HS) codes from that of the raw materials. Substantial transformation does not include repackaging and rebottling and logging of timber.

⁷ Natural resources mean unprocessed or raw natural produce, including timber, wholly derived in or from Fiji.

⁸ Manufacturing means any activity included under the major Division 3 of the Fiji Standard Industrial Classification (FSIC) codes.

- **Duty Concessions –**

- Goods imported in primary form for manufacturing purposes, which require further processing qualifies for a concessionary duty rate of 3% fiscal plus 12.5% VAT;
- Capital Items - Duty rates on capital items (which refer to machinery used for converting/processing raw materials) will attract 5% fiscal duty + 12.5% VAT.

6.0 EMPLOYMENT AND SKILL LEVELS

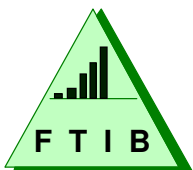
Seaweed farming will benefit rural communities as farming is done part time during low tide which can be programmed with village chores on a daily basis. The main tasks involves planting, de-sedimentation during grow out, harvesting and drying; a cycle which takes between 10 to 12 weeks.

Value adding production for the industry will require specialised expertise and skill set which may require overseas recruitment/training to be undertaken. On the other hand, there is an adequate supply of food technologists in the country. Science graduates of the University of the South Pacific (USP) and laboratory technicians trained by Fiji Institute of Technology (FIT) can, with further in-house training be employed in the industry.

7.0 POTENTIAL FOR EXPORTS AND GROWTH

Kappaphycus alvarezii is the major raw ingredient for the extraction of *carrageenan*, which is widely used in food processing. Recent uses in cosmetic and pharmaceutical industries worldwide have increased the demands for the product. Known uses of the product are as binders in canned meats, drug encapsulation such as in antibiotics, as stabilizers in the manufacture of ice-creams, tomato sauce, glues, resins, Colgate, milkshakes. Demands for the product is huge and increasing at 5% annually as new uses are being identified and developed. Given the appropriate support, this commodity has the potential to develop into an export industry in a decade.

Nevertheless, the demand from the market needs to be fulfilled to ensure farmers get the maximum benefit from this project and 9,000 tons a month is a benchmark set for the next three years. This should increase the number of seaweed lines from the current 32,000 to 600,000 to be able to sustain this market. There is a big opportunity to add value locally once production reaches a certain level, by construction of a processing factory here in the region. The long term objective is to establish a Processing Factory locally once the desired production is achieved and sustained which will create employment opportunities and revenue return.



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