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# Problems related to the foreign exchange earnings of Surinam's shrimp industry

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Keywords : Export earnings - Foreign exchange earnings - Shrimp fishery - Shrimp business - Shrimp sector - Surinam.

**Summary**

*The shrimp grounds of Surinam are actually fully exploited by some 136 trawlers of the Florida type, ranging from 100 to 130 GRT. Through export and import levies and fishing licence fees the country was able to obtain a small piece of the foreign currency cake. The Republic of Surinam has been looking for means to increase the benefits from its shrimp business. The alleged huge profits made by foreign vessels inspired the country to invest in a national shrimp fleet and man it with national crew (SUGAM). For reasons explained in the text Sugam has difficulties to operate with a gain. This paper will review Sugam's attempt to earn hard currency. An analysis is made of the foreign exchange earnings of Sugam and is compared with the results of a Korean company. The main conclusions are as follows: shrimp exploitation in a fully exploited Exclusive Economic Zone can only be brought to success by fishermen of proven ability. Each vessel should make trips lasting from 45 to 60 days and be some 280 days at sea per year. Surinam should also reconsider its present policy of shrimp purchasing.*

**Résumé**

*Les ressources en crevettes du Suriname sont considérées à présent comme exploitées à fond par environ 136 crevettiers du type Florida. Traditionnellement le pays s'assure une partie des revenus d'exportation au moyen des taxes sur les importations et les exportations et des droits de licences. Sur base des profits supposés considérables, réalisés par les sociétés étrangères de crevettes, le gouvernement a créé à son tour une compagnie nationale de pêche à la crevette dont l'équipage était entièrement local: la SUGAM. Celle-ci éprouve cependant des difficultés à être rentable. Cette étude donne un aperçu de la tentative de Sugam de gagner des devises fortes. Une analyse des revenus en devises de Sugam est comparée aux résultats moyens d'une compagnie coréenne. La conclusion principale est que l'exploitation des crevettes dans une "Zone Economique Exclusive" fort pêchée, ne peut être menée avec succès que par des pêcheurs de très bonne qualité. Tout bateau doit faire des sorties moyennes de 45 à 60 jours et totaliser 280 jours en mer par an. Il faut aussi que le pays redéfinisse sa politique d'achat des captures de crevettes.*

## 1. Introduction

It has been a longstanding characteristic of Surinam's economy to sell concessions to foreign enterprises and live from the royalties. Even today this policy can be found in its fishery sector, where one observes Venezuela handliners fishing the highly desired Red Snapper (*Lutjanus purpureus*) as well as Korean and Japanese companies trawling on shrimp (*Penaeus brasiliensis, P. notialis, P. subtilis*).

As many other coastal developing countries, Surinam considers its marine resources as a quick means for solving their foreign currency problem. The reason that they easily accept this view is obvious. Penaeid shrimps score high prices in the overseas markets of the rich countries (U.S.A., Japan, Western Europe) and, as the supply of shrimps is likely to become increasingly inelastic, will continue to do so. Although one often fears the significance of aquaculture and its effect on price making, one expects that by the end of the century

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its contribution will only amount to 5% of total shrimp production (4). Hereafter there may be an upswing in the quantity and international trade of shrimps, once all difficulties regarding intensive shrimp culture systems are solved (3).

Over the years tropical coastal countries have often encouraged private, overseas enterprises to trawl in their waters (1). In Surinam, the number of Japanese and Korean owned vessels grew steadily. Profits were considerable, especially at the time that stocks were only moderately exploited, but were not maintained in the country. Hence the government of Surinam decided to augment its share of its marine resources and founded a national fleet "Sugam" (Surinaamse Garnalen Maatschappij).

Expectations were high but the initial goal of earning foreign currency was not met.

## 2. Profile of the shrimp industry

### 2.1. General considerations

In Surinam, between 1976 and 1984, on an average about 165 trawlers were landing shrimp to two shrimp processing plants. Technically all vessels are of the Florida type, double-rigged trawlers in the range of 100 to 130 GRT and equipped with engines of 350 to 450 hp.

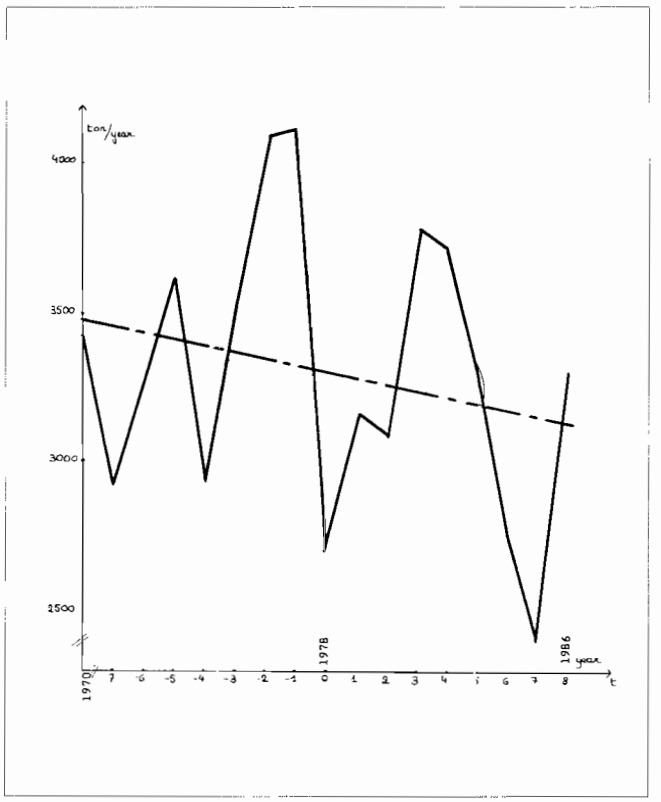


*Figure 1*: Recorded total yearly shrimp landings (head off) 1970 - 1986 (continuous line)
trend: y = 3304 — 21,02 t (interrupted curve)

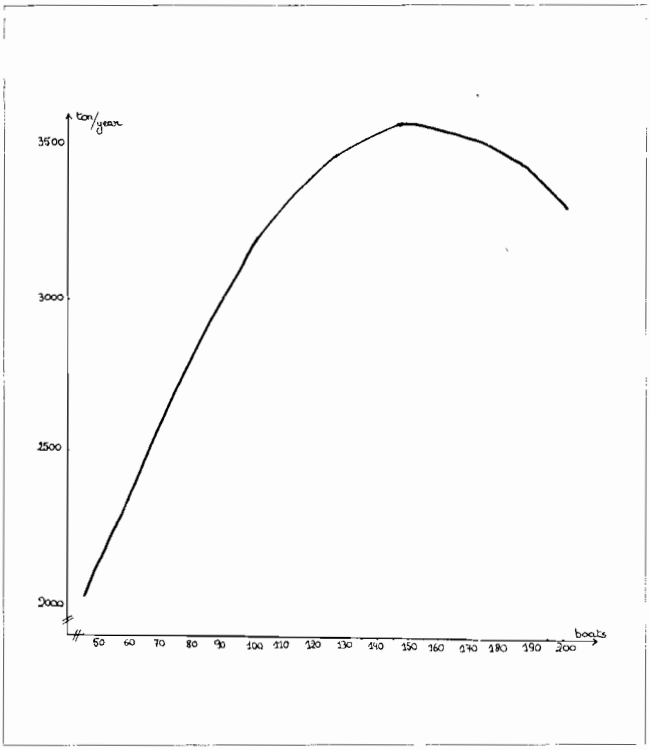


*Figure 2*: Theoretical yearly shrimp production in function of the number of trawlers.
production curve: $y = 2025 + 28,4\,x - 0,13\,x^2$
(number of boats = 45 + x).

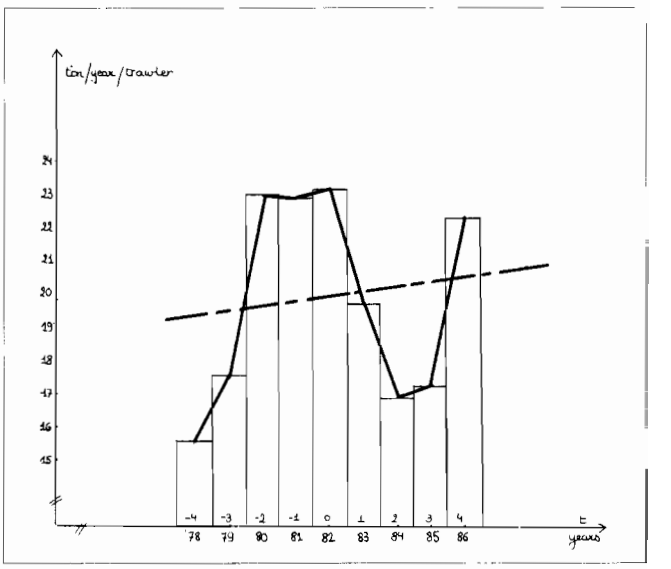


*Figure 3*: Evolution of the yearly average landing of a trawler operating in Surinam waters (block diagram or continuous line)
trend (interrupted curve): y = 0,17 t + 19,8

As the shrimp grounds are considered fully exploited (see fig 1,2,3) there is no scope for further expansion of the trawl fleet. On the contrary, reduced yields over the period 1983- 1985, forced about thirty (30) boats to leave Surinam's Exclusive Economic Zone, so that now 136 vessels are still operating. All boats deliver their landings to one of the two processing plants established in the country (4).

The oldest shrimp processing plant, SAIL (Surinam American Industries Ltd) was founded in 1956. Since 1985 the Republic of Surinam became the only shareholder through a stock purchase agreement.

Through this transaction it also became the sole owner of the local Sugam fleet, set up for the purpose of generating foreign currency, self-management of its marine resources and providing employment for local fishermen. A second venture, called Sujafi (Surinam Japan Fisheries), was created in 1973. Sujafi is a private processing company with 15% of the shares belonging to Surinamese owners. Although the plants have similar capacities, they differ in their degree of integration with the shrimp industry and in their markets.

SAIL is mainly oriented towards the U.S. market and actually buys shrimp from the Korean and Sugam fleet. After processing SAIL is responsible for the marketing. The Japanese vessels hire the processing facilities of Sujafi at a fixed cost per tonne of shrimp and export the shrimp under their fleet's name, predominantly towards Japan. Through shares Sujafi, the fishing companies and the Japanese importing companies are interrelated.

### 2.2. Sugam - the national shrimp company

Sugam was founded in 1972 by the Republic of Surinam and SAIL, but since 1985 Surinam has became the exclusive shareholder. The company set off with 20 boats (in 1975) but, through weather disaster and theft (piracy), the total number of boats employed dropped to 15 in 1984. This number has been maintained until today. The fleet's daily management is carried out by SAIL. In addition, SAIL takes care of the processing of shrimp and acts as a selling agent.

Analyzing the first results of both the local company and the total shrimp industry, the decision made by the Board of Directors, to curtail foreign expenses — of which salaries for overseas crew were and are a main component — through localizing the entire company's crew was logical. Unfortunately and despite the fact that 1977 was an exceptionally good year, this strategy was called for at a time that initial overexploitation was a fact but not then evident.

One year later the symptoms of overexploitation became visible: 1978 was a disastrous year for every trawler operating along the Guyana-Brasil plateau.

The following years, the total shrimper fleet was thinned and trawling became profitable again. But Sugam had a hard time compating with professional Korean and Japanese vessels (5) for the shrimp resources. Furthermore shrimp behaviour and its population dynamics are difficult to forecast.

One thing became obvious: at Sugam's company level it was clear that the local boats (local labour) could no longer stand comparison with the Korean-crewed boats. After two and a half years of experimenting the "nationalization scheme" was abandoned.

Koreans were again playing a key role in Sugam's results. But for other reasons (some of which have a psychological nature, others an obvious physical one e.g. lack of dry-dock facilities, too much idle time during crew replacements). Sugam could no longer operate with a gain. Eight consecutive years of loss followed by at long last, a fairly positive one ('86) amounted the total cumulated loss at close to 15 million Surinam guilders.

Although last year's results brought back aspirations which (in addition) seem to be supported by this year's achievements one should carefully weight off the odds of shrimp fishing, before continuing trawling operations in its own name. The effect of reduced fuel costs and the possibility of replacing the old vessels (average age 14 years) by economically superior ones on the company's financial rentability should be carefully considered, although admittedly these factors raise Surinam's hope for the future.

## 3. Foreign exchange earnings

The net foreign exchange earning is the difference between the F.O.B. value of yearly exports and the foreign exchange payments for imported capital goods, services and labour.

Sujafi's only contribution to the foreign currency balance is payment of the licence fee of its vessels. SAIL however generates dollars through marketing of shrimps and supplying fuel and capital goods on which taxes are levied to its centracted vessels and of course from licence fees. In order to obtain a good estimation of the shrimp industry's importance as dollar generator, two methods are at hard. In the first model one analyzes sales and cost of sales of the transactions between the processing factor and its vessel companies (export shrimps, local market of shrimps, fuel and lubes, bondeo warehouse and local goods). Assumptions are made on the foreign currency component of each item. The gress profit is then scrutinized for the remaining foreign currency expenditures. In a second model seen from a national point of view, the distinction is made between the production and processing part of the shrimp industry. As far as production is concerned one examines the average cost structure of standardized boat. With regard to the latter, estimations are made of the dollar component of industrial shrimp processing.

Parameters used to calculate the foreign exchange cost of the export earnings of the shrimp industry:

*1. Production components:*
— fuel and lubrication: 100/103 (3 % import tax)
— supplies: 100/103 (3 % import tax)
— repair and maintenance: 50 % foreign component (F.C.)
— crew wages: 80 % F.C.
— insurance, depreciation: 100 % F.C.
— licence fee: 100 % F.C.

*2. Processing components:*
— packing material: 50 % F.C.
— depreciation of buildings: 50 % F.C.
— computer expenses: 100 % F.C.
— repair and maintenance: 50 % F.C.

Both methods, of which the first is preferable as it includes fewer assumptions due to better data access, give rise to approximatively the same results. For each dollar gained, the industry has to spend 85 to 92 dollarcents, in order to ensure a continuation of activities (6). In view of the fairly limited possibilities for net foreign exchange earnings — most cost components are external factors and thus beyond Surinam's control — it made a great deal of sense to think of substituting Korean crew members by locals in order to enhance economic gains.

## 4. Localizing the Sugam fleet

### 4.1. Difference in trawling performances according to crew composition

It was expected to economize 20 % on dollar costs through an altered crew policy while at the same time securing, if not augmenting present landings of shrimps.

Maximum exploitation of the shrimp stocks put the competition in fishing skills between different national fleets to a real test. Results are shown in table 1.

***TABLE 1***

**Average trawler performance according to company (Korean versus Sugam)**

| Year | Days at sea | | Catch (kg) per day at sea | | Total catch (kg) | | Efficiency in % | |
|---|---|---|---|---|---|---|---|---|
| | Korean | Sugam | Korean | Sugam | Korean | Sugam | Korean | Sugam |
| 1978 | 203 | 155 | 56 | 44 | 11.368 | 6.820 | 100 | 60 |
| 1979 | 230 | 174 | 85 | 50 | 19.550 | 8.700 | 100 | 45 |

Source: SAIL, Yearly financial statements - Sugam, 1978-1979.

As can be seen from table 1, local manned boats were performing at about half the efficiency of Korean vessels belonging to the same company.

One had not to wait for the 1980 results to take action. The company quickly signed an agreement with a Korean agent for the recruiting of Korean crew. Arrangements were made to restore the traditional ways of shrimp catching, Korean were confirmed in their reputation of indefatigable fishermen.

***TABLE 2***

**Terms of efficiency between Sugam and average foreign owned and managed company.**

| Year | Average landing per trawler (excl. Sugam) | Average landing per Sugam/trawler | Fishing efficiency (2):(1) (in %) | Number of days at sea per Sugam/trawler | % of idle time per Sugam/trawler |
|---|---|---|---|---|---|
| '77 | 20,2 | 33,7 | 167 | N.A. | N.A. |
| '78 | 16,3 | 9,2 | 56 | 183 | 50 |
| '79 | 17,7 | 15,5 | 88 | 209 | 43 |
| '80 | 23,9 | 19,6 | 82 | 248 | 32 |
| '81 | 22,6 | 25,4 | 112 | 285 | 24 |
| '82 | 24,1 | 16 | 66 | 224 | 36 |
| '83 | 20,1 | 16,1 | 80 | 244 | 31 |
| '84 | 17,1 | 14,7 | 83 | 237 | 38 |
| '85 | 17,5 | 15,3 | 87 | 246 | 32 |
| '86 | 22,4 | 21,4 | 96 | 237 | 34 |

P.S. optimal % of idle time = 23,3 %.

Source: Ministry of Agriculture, Yearly Publications of Agriculture Statistics, 1977-1986.
Sail, Yearly Financial Statements - Sugam, 1977-1986.

Over the years, as new data was collected, indications on the difference in fishing efficiency between the Sugam and Foreign companies became irrefutable (see table 2). If the Sugam fleet had been operated as efficiently as any other Korean company the present accumulated loss would have been reduced from about Sf.* 12 million during the periods 1977-86 to less than a million (see table 3).

***TABLE 3***

**Effect of equal efficiency in shrimp catching on Sugam's financial results (in Sf. 1.000)**

| Year | Average income per Sugam trawler | Average yearly income per trawler by equal efficiency | Average yearly company income (Sugam) |
|---|---|---|---|
| '77 | + 65 | + 65 | 1300 |
| '78 | — 115 | — 29 | — 580 |
| '79 | — 27 | + 5 | + 95 |
| '80 | — 84 | — 12 | — 228 |
| '81 | — 8 | — 8 | — 144 |
| '82 | — 135 | + 126 | 468 |
| '83 | — 80 | 0 | 0 |
| '84 | — 168 | — 114 | — 1710 |
| '85 | — 121 | — 85 | — 1275 |
| '86 | 72 | + 89 | + 1335 |

P.S. total accumulated loss (1977-1986) at equal efficiency =Sf. 739.000.

Source: Own investigation.

*1 U.S. = 1,8 Sf.

4.2. Comparison of cost structure of shrimp trawlers (in 1.000 U.S. $) operating Suriname's Executive Economic Zone (Sugam versus an average company).

***TABLE 4***

**Cost structure of Sugam versus an average shrimp company.**

| Items | 1982 | | | | 1986 | | | |
|---|---|---|---|---|---|---|---|---|
| | Cost boat | | Percentage | | Cost boat | | Percentage | |
| | All | Sugam | All | Sugam | All | Sugam | All | Sugam |
| Total costs | 265 | 249 | 100 | 100 | 195 | 191 | 100 | 100 |
| Variable costs | 197 | 184 | 74 | 74 | 151 | 170 | 77 | 89 |
| – Fuel and lubrication | 87 | 75 | 33 | 30 | 55 | 52 | 28 | 27 |
| – Supplies | 20 | 39 | 8 | 16 | 24 | 39 | 12 | 20 |
| – Repair and maintenance | 35 | 48 | 13 | 19 | 16 | 50 | 8 | 26 |
| – Crew wages | 55 | 22 | 21 | 9 | 56 | 29 | 29 | 15 |
| Fixed costs | 68 | 65 | 26 | 26 | 44 | 22 | 23 | 11 |
| – depreciation | 20 | 29 | 8 | 12 | — | — | — | — |
| – interest | 30 | 7 | 11 | 3 | 30 | 4 | 15 | 2 |
| – insurance | 8 | 17 | 3 | 7 | 8 | 10 | 4 | 5 |
| – licence free | 5 | 4 | 2 | 2 | 5 | 4 | 3 | 2 |
| –administration | 1 | 8 | 2 | 3 | 1 | 4 | 1 | 2 |
| Total cost/day at sea in $ | .0,95 | | 1,11 | | 0,70 | | .0,81 | |
| Exploitation cost/day at sea in $ | .0,70 | | .0,84 | | .0,54 | | .0,72 | |
| Cost/kg of shrimp in $ | 11,00 | | 15,56 | | .8,71 | | .3,93 | |

Sources

– William R. and Garcia S.M., A bio-economic model for the analysis of sequential artisanal and industrial fisheries for tropical shrimp (FAO Fish. Techn. Pap, (270) · 49 p.

– Own investigation.

To show the difference in efficiency of shrimp catching Sugam's cost structure is compared to that of an average overseas company. It should be noted that 1982 was a poor year, while during 1986 catches were again good.

Despite a fairly similar cost structure in 1982 (average variable cost: 74% of total costs for both groups), total most and exploitation cost per kg of shrimp landed and per day at sea is significantly higher for the Sugam fleet. High wages for experienced expatriate crew and higher costs for energy reflect the better performance of the foreign fleet. Linked to this are the modest costs for repair and maintenance works and supplies, indicator of more and more efficient days spent at sea by foreign boats.

Most striking for the 1986 cost composition is a substantial reduction of total, variable and fixed costs (and hence production cost of a kg of shrimps), attributed mainly to decreased energy prices and absence of depreciations. The fact that the vessels are completely amortized explains the relative rise of variable costs. In the case of Sugam one notes that the heading repair and maintenance works is still excessively high. This clearly shows the old state of the vessels but also exposes the damaging impact of returning to port to carry out minor repair works which could be taken care of at sea. High landings for both groups resulted in a comparable cost price per unit of landed shrimp. However, an average overseas company outdoes Sugam in cost per day at sea because of less idle time involved between trips and the higher length of an average trip.

## 5. Discussion and conclusion

Although one can only stimulate the idea of self-governing one should not overlook its implications. In its quest for foreign exchange earnings, Surinam had stepped up fishing effort to excessively high levels in the absence of regulatory measures. This means overinvestment and consequent battling for the remaining riches under strong, competitive circumstances. To get the highest return from its fishery foreign currency potentials, fishery policymakers may decide to embark on a scheme to gradually localize the national fleet. In Surinam a first attempt to do so failed. Surinam had to accept the reality that shrimp exploitation in fully fished waters can only be done with benefit by fishermen of proven capability. This of course should not stop the training of local men in view of a localizing of the fleet in the long run.

The first conclusion of the Sugam experiment is that local crews were not able to complete with Koreans. One may understand the Government's point of view in providing employment for as many Surinamese as possible but commercially spoken this has proven to be inadvisable. Apparently local crew were not capable of making the transition form ice boats to freezer boats which have to stay longer at sea before they become profitable.

Secondly, the yearly cost of a shrimp trawler mainly comprises variable costs. However, repair and maintenance works and supplies remain nearly unchanged, regardless of the number and of the length of trips. Hence a trawler needs to spend a certain minimum number of days at sea to cover these and fixed costs. Once above this minimum production, the majority of the gross earnings flows back to the company as profit (after deduction for fuel and lubrication and extra crew pay).

In order to reach an optimum of active days spent at sea it should become compan's policy to fix all minor repairs, for which one need not return to harbour, at sea. In addition dry dock facilities should be upgraded and loss of time inherent in replacement of foreign crew brought to a minimum as these

factors make up main fluctuations in idle time. One should arrive at trips lasting on an average, 45 to 60 days and spend approximately 280 days at sea per year.

As Surinam will largely remain dependent for its shrimp exploitation on overseas goods and services its net foreign exchange gain will continue to be limited. If current trends of decreasing fuel prices and augmented catch efficiency (through hiring experienced fishermen) go on, Sugam may become profitable on a sustained basis.

But in particular Surinam should reconsider its present policy of shrimp purchasing and enforce control of its 200 miles zone. With regard to price policy it should determine a purchase agreement based on the "New York Greensheet price" (the weekly reference price published by the U.S. Department of Commerce) and the actual production cost of shrimps. By doing so the country will have far better chances to withhold more cents per dollar gained than at present.

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**Samenvatting :**

De Surinaamse garnaalgronden worden thans ten volle uitgebaat door ongeveer 136 garnaalboten van het Florida type. Het land verzekert zich, door middel van export- en importheffingen en vangstvergunningen, van een klein deel van de exportopbrengsten uit garnalen. Geïnspireerd door de vermoedde hoge winsten van buitenlandse maatschappijen werd door de overheid over gegaan tot de oprichting van een nationale vloot bemand door lokale vissers · de Surinaamse Garnalen Maatschappij (SUGAM). Sugam heeft evenwel moeilijkheden om winstgevend te zijn. Deze studie geeft een overzicht van de pogingen van Sugam om deviezen te verdienen. Een analyse werd gemaakt van de vreemde valuta opbrengst van Sugam en vergeleken met de resultaten van een "gemiddelde" Koreaanse maatschappij. De belangrijkste conclusie is dat garnalenuitbating in een sterk beviste Economisch Exclusive Zone slechts succesvol kan zijn wanneer gedaan door ervaren vissers. Elke garnalenboot moet 45 tot 60 dagen op zee blijven per reis en jaarlijks ongeveer 280 dagen op zee hebben doorgebracht. Het land moet ook aandacht schenken aan de aanpassing van het huidige garnalen inkoopbeleid.

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