

## Prawn farming in New Caledonia

*Source: Note Express de l'Institut d'Émission d'Outre-Mer, France (November 2010) ([http://www.ieom.fr/IMG/pdf/ne26\\_aquaculture\\_crevettes\\_nc.pdf](http://www.ieom.fr/IMG/pdf/ne26_aquaculture_crevettes_nc.pdf))*

*New Caledonia's second largest export industry after nickel is prawn farming,<sup>1</sup> which has been in existence for over 30 years. With its XPF<sup>2</sup> 1.5 billion turnover<sup>3</sup> in 2008, and 500-strong workforce, it is a significant source of employment and income for the territory's rural population. After consistent growth up until 2005, the industry suffered considerable production and export setbacks following biological issues aggravated by a shortage of post-larvae. Although it has been in recession for several years now, it still has room for action as well as development potential in terms of production sites and farm expansion. Despite being heavily dependent on government subsidies, prawn farming has contributed to economic decentralisation and is one of the territory's major development sectors.*

### Industry overview

#### Significant contributor to rural New Caledonia's wealth and employment

The Établissement de régulation des prix agricoles (ERPA)-listed farms registered an XPF 1.5 billion turnover in 2008, making prawn farming the rural sector's second-largest income generator after vegetables. In 2008, it also accounted for nearly one-third of all revenues from animals and produce.

Since 1995, the industry has been the territory's second largest exporter, albeit far behind nickel. In 2008,<sup>4</sup> it accounted for 84% of all agricultural exports and 67% of all marine products.

In 2006, the industry had a 515-strong workforce in full-time-equivalent terms, and 32 separate companies, with farms and hatcheries employing nearly 60% of personnel and a packing plant one-third. Two-thirds of the jobs are seasonal. The average number of staff on a prawn farm is 7 workers and 29 in a packing plant.

Assuming that one aquaculture job generates five indirect jobs,<sup>5</sup> 2,000–3,000 extra jobs have been created in New Caledonia.

Prawn farming also contributes to keeping the rural population in their home areas. For example, most shareholders in the Webuihoone Farm in Voh are from neighbouring Melanesian villages.

#### A vertically integrated industry

Aquaculture is a vertically integrated industry made up of three tiers:

1. feed suppliers and hatcheries that supply prawn feed and post-larvae, respectively, to non-broodstock farms;
2. non-broodstock farms, where prawns are bred until they are mature (i.e. seven or eight months); and
3. packing plant that processes, packages and dispatches the prawns.

Being highly integrated, the industry incurs systemic risks, but also enjoys various synergies.

Most prawn-farm produce (i.e. two-thirds) is for export through two operators who handle packaging and marketing, namely STANC,<sup>6</sup> a SOPAC<sup>7</sup> subsidiary, and SAS Peneide de Ouano, a member of the Blue Lagoon Farm/Peneide de Ouano group (BLF-PO).

The main export markets are mainland France, Japan and the United States.

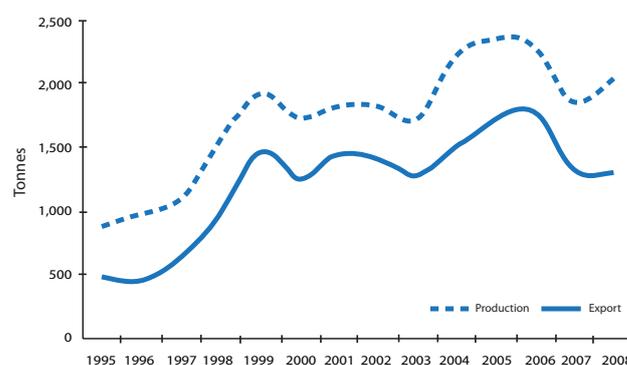
### An industry in recession

#### Yields and exports clearly in decline ...

After the 2,339-tonne peak reached in 2005, prawn yields fell by 13% over the following three years and export volumes plummeted by 24% during the same period.

In recent years, export destinations have undergone change, with mainland France falling to second place (from 56% to 36% between 2005 and 2008) and superseded by more profitable Japan.

China is a promising market, owing to high growth and rising living standards with an ever-increasing proportion of the population demanding luxury foodstuffs.

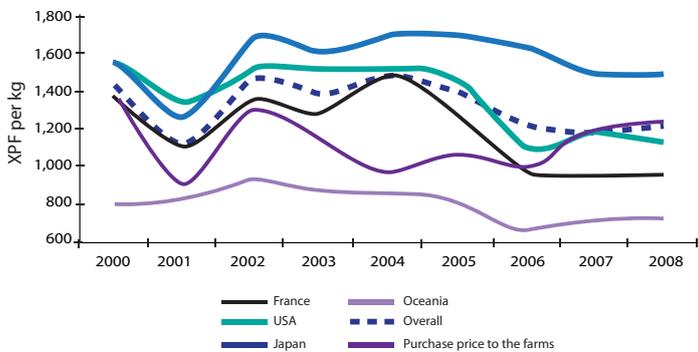


Prawn production and export in volume (Source: ISEE)

...against a backdrop of falling prices

New Caledonia's share of world prawn production is negligible at less than 0.1%. The local aquaculture industry has, therefore, to adjust to world price fluctuations. Following a worldwide glut and the US dollar's fall against the Euro, the average per-kilogramme export price of New Caledonian prawns declined from an XPF 1,482 peak in 2004 to XPF 1,223 in 2008 (i.e. an 18% decline).

Falling sale prices on mainland France market (-37% from 2004 to 2008) led to exports' being gradually redirected to other markets offering higher prices, but the trend has slowed for the time being by the production slump.



Average price per destination (in XPF per kg)(Source: ISEE)

Japan is a wealthy market that clearly illustrates the industry's niche-market strategy. It is currently the most profitable, providing an average revenue of XPF 1,602 kg<sup>-1</sup> (i.e. 37% better than other markets during the same period), although the sale price fluctuated significantly (-11%). The export price to Pacific countries<sup>8</sup> rose by 28%, but these markets only accounted for 9% of total export revenue in 2008.

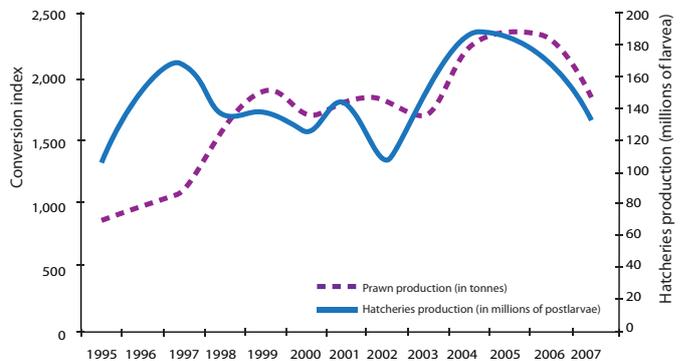
The combination of declining export prices, production slump, and currently oversized processing plant led to a falling per-kilogramme purchase price at the plant, which fell on average from XPF 859 to XPF 744 between 2003 and 2008 (i.e. a decline of 13%).

The difficulties encountered by post-larval producers and farms...

→ Post-larval shortage

Post-larval yields plummeted by 23% from 2004 to 2008. The steep yield decline, due to late seeding in production ponds, led to a major fall in farm operations and hence packing plant trade. Several hypotheses have been advanced to explain the significant post-larval shortage. The problems were caused by high pond temperatures (i.e. >30°C), particularly during the warm season and especially

during the 2007/2008 production season. In more general terms, the root cause pointed out from the outset by operators was recurrently declining breeding stock fertility during the warm weather. Funds have been committed to resolve the issue and thereby ensure summer harvesting so as to make production more regular.



Production from farms and hatcheries (Source: ERPA)

→ Disease leading to highly seasonal production

Yields have been affected by two diseases for several years (cf inset below) and these have spread to most farms, leading producers to opt for an annual production cycle so in order to avoid the cool season when mortality rates are particularly high. Approximately three-quarters of farm production was, therefore, conducted from December to June/July. Such timing was viable while prices and farm profitability were relatively high, but is no longer workable today. Although almost all farms seed their ponds only once a year, some seed a small surface area twice yearly to stagger their production.

Diseases affecting local farms

Two seasonal bacterial diseases affect New Caledonia's aquaculture, namely "winter syndrome", which appeared in 1993, and "summer syndrome" which appeared in 1997. Farms adapted to the first disease by shifting their production cycle to start after the cool season. Summer syndrome only affected a few farms, but did so severely. Both diseases lead to lower-than-normal survival rates and, therefore, a higher conversion index (CI). Experiments carried out by IFREMER in partnership with industry stakeholders on Aigue-Marine farm in Boulouparis, showed that the syndrome can be significantly mitigated by altering breeding protocols.

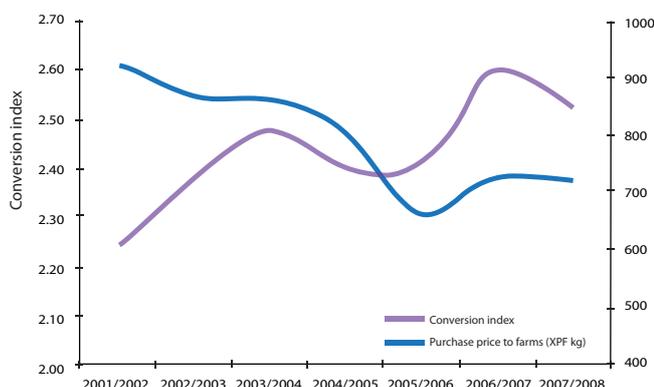
New Caledonia has so far been able to protect itself from major viral diseases that affect most prawn producers in the world, particularly in Latin America and Asia. When a Hawaiian stock was introduced to offset New Caledonian stock's low genetic variability and high inbreeding levels, the introduced stock proved susceptible to the IHNV virus, demonstrating how important it was to preserve and protect the local stock that is resistant to the virus. Once the Hawaiian stock was totally eradicated, the virus fortunately ceased to be a problem. UPRAC-NC adopted five resolutions to implement a programme for protecting the industry from disease and elaborating a genetic approach including a plan to re-introduce the Hawaiian stock as safely as possible.

### ... raise structural and profitability issues...

Packing plant capacities increased significantly while yields and prices were falling, leading to a considerable overall profitability loss to the industry. In addition, low survival rates were experienced largely due to disease. The average survival rate for the period 2000–2008 was low at 52%, and operators consider that below 50% the situation for farms becomes critical.

Conversion index (CI) trends (i.e. in the amount of feed required to obtain one animal unit), are good indicators of farm profitability because feed is the largest budget item, accounting for 25–30% of total production costs. This rose by 15% from 2001/2002 to 2007/2008, reaching CI of 2.5 in the latter season.

Industry operators consider a CI of 2 to be acceptable, and farms are aiming to reduce it in the short term to 2.4 (i.e. the average index from 2003 to 2006).



Purchase price to farms and conversion index (Source: ERPA)

### ... and weaken operators

The fact that farms concentrate their production into five months of the year requires the rest of the industry to operate seasonally. Hatcheries and feed suppliers who provide inputs have adapted to this, with hatcheries operating for seven months (from September to March) and feed suppliers experiencing a production peak in autumn. Such concentrated operations make the entire industry prone to any difficulty that any of the operators may encounter.

The post-larval shortage is a good illustration of this (cf. above).<sup>9</sup> The industry was able to overcome the crisis with government intervention through ERPA, which considerably increased its export assistance for farms, raising it twelve-fold from 2005 to 2008.

Also, for approximately seven months of the year (from August to February), the STANC packing plant operates at an average of 18% capacity, but close to full capacity for the rest of the year (over 80% in June). This seasonal pattern has a negative impact on the short-term payment of fixed costs and, more generally, on the whole

industry's plant cost effectiveness. It also leads to a high dependence on seasonal labour.

## Post-recovery policies and the industry's future prospects

### Applied research

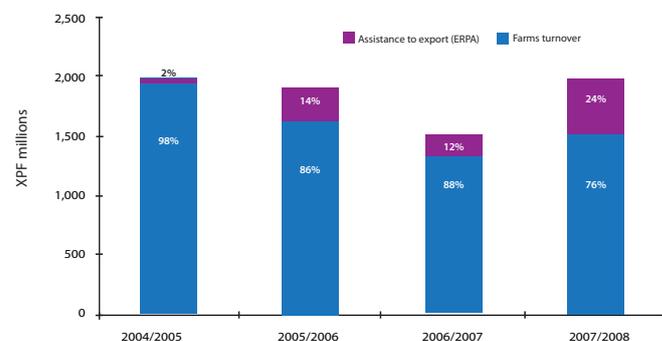
An experimental project entitled "Post-Recovery Experiments" aimed at conducting tests to mitigate summer syndrome in the short term by improving survival rates and yields was launched in late 2006 by the Groupement des Fermes Aquacoles (GFA) (aquaculture group) in partnership with IFREMER and Northern and Southern Provinces government departments. Experiments were carried out during the 2006/2007 and 2007/2008 seasons on Aigue-Marine farm that had been heavily affected by summer syndrome in the earliest stages of production. Results have so far been generally encouraging with both technical inputs and knowledge increasing significantly. It has been found that pond sediment richness plays a decisive role in lowering mortality rates.

The fact that the breeding programme has been shelved has, however, been disappointing for the industry as it promised progress.

### Government impact on supply

#### ➔ An industry heavily supported by government

Government assistance to the aquaculture industry increased sharply from XPF 400–900 million between 2007 and 2008. More than one-half of the assistance came from ERPA and the remainder from the Northern Province (38%), Southern Province (5%) and Territory (4%). Out of the total XPF 343 million of assistance provided by the Northern Province in 2008, 41 million was allocated to prawn farming proper, with most of the funding being earmarked for part of CCDTAM's (New Caledonian marine aquaculture development and transfer centre in Kone) preliminary construction costs.



Funding assistance to export and farm turnover (Source: ERPA)

In an attempt to mitigate recurrent post-larval shortages of recent seasons, a programme has been set up by ERPA to provide incentives to hatcheries to produce as many post-larvae as possible.

The industry also benefits from technical assistance in the form of research programmes conducted by IFREMER as part of the latter's partnership with the French, New Caledonian, Northern and Southern Provinces governments. The assistance programme is governed by a four-year contract between the various partners under the 2006–2010 development programme. Research mainly focuses on understanding the diseases affecting New Caledonian prawn farming, analysing the causes of low hatchery yields, developing optimised feed, and understanding prawn physiological phenomena and reactions in a farm environment. Through the partnership, the LAC (New Caledonian aquaculture laboratory) facilities in Boulouparis were restored, the first stage being completed in 2009, and a branch of the laboratory was set up in Kone.

→ *Virtually no progress on tax exemptions for farm and hatchery start-up projects since 2004*

Tax incentives are provided for starting up aquaculture farms under the joint effects of the Girardin and Frogier Acts<sup>10</sup> (replaced in late 2007 by new overseas-country-based legislation<sup>11</sup>). The aquaculture industry was significantly developed with this assistance and now appears to be dependent on it. The per-hectare investment cost is high owing to rising overall costs of excavation and civil engineering works, the complex facilities required and the observance of environmental constraints.

Since 2004, only one project, which involved restoring a hatchery, was approved. If other projects are set up, they may contribute to developing the industry.

### *The industry's niche-market strategy*

Obtaining quality certification is crucial to a high-added value, niche-market strategy. The blue prawn marketed by SOPAC was well received by buyers, because it had been awarded several quality certificates and SOPAC is currently attempting to gain the "red label". In order to find other more profitable market outlets and to promote New Caledonian prawns as a luxury produce, SOPAC has also launched a high-end prawn, which has been

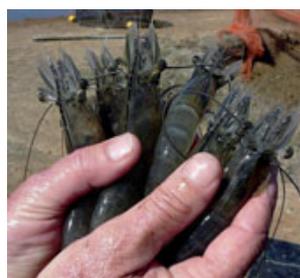
adopted by several leading Parisian chefs and accounts for about 15 tonnes of the local yearly yield.

### Conclusion

Prawn farming has been practised for 30 years in New Caledonia and has developed significantly up until the early years of this century. It was able to acquire the techniques and know-how to expand and produce a quality product that has received worldwide recognition. The industry currently has excess processing capacity and is suffering from over-investment in addition to a structural problem caused by high prawn mortality rates and a highly seasonal production cycle that hinders significant development. Low survival rates have had a considerable impact on farm cost-effectiveness. The recession has deepened in recent years, with hatcheries under-producing, underlining the whole industry's currently fragile state and, as a result, government has significantly increased its assistance. For the time being, however, the industry's critical situation is no incentive for funding new projects.

There are, nevertheless, ways out of this difficult situation and some such avenues have been explored for several years now. Initially, the prime objective is to strengthen post-larval production and enable farms to return to yield levels that will ensure sufficient volumes for marketing. It is vital to hold on to traditional clients, avoid losing the ground gained by the search for new niche markets, and promote New Caledonian prawns as a luxury produce.

With new nickel smelters being built in the territory, diversifying the economy is a critical issue and prawn farming is a sustainable source of income and employment for the rural population.



*The blue prawn  
(Litopenaeus stylirostris).  
Image: Jacky Patrois*

1 Based on *Litopenaeus stylirostris*, also known as "blue prawn".

2 XPF 100 = EUR 0.84 (or USD 1.15 or AUD 1.15 in January 2011)

3 Source: ERPA (agricultural price regulation body). This figure only covers sales by all farms, except Bassins de Dumbéa, to the packing plant and direct sales on the local market. It does not, therefore, include packing plant and hatchery income that, taken together, would double the industry's turnover.

4 Sources: ISEE (New Caledonia institute of statistics and economic studies) and DAVAR (New Caledonia directorate of veterinary, food and rural affairs).

5 Source: FAO (Food and Agriculture Organization of the United Nations).

6 Société de Transformation Aquacole de Nouvelle-Calédonie (New Caledonian aquaculture processing company).

7 Société des Producteurs Aquacoles Calédoniens (New Caledonian aquaculture producers' company).

8 Australia, New Zealand, Tahiti and Wallis and Futuna.

9 Unité Néo-Calédonienne de Sélection et de Promotion des Races Animales (New Caledonia unit for the promotion and selection of animal breeds)

10 The Frogier Act, ie Overseas Country Act no 2002-019 of 29 April 2002

11 Overseas Country Act no 2008-1 of 3 January 2008 on tax incentives for investment purposes.