

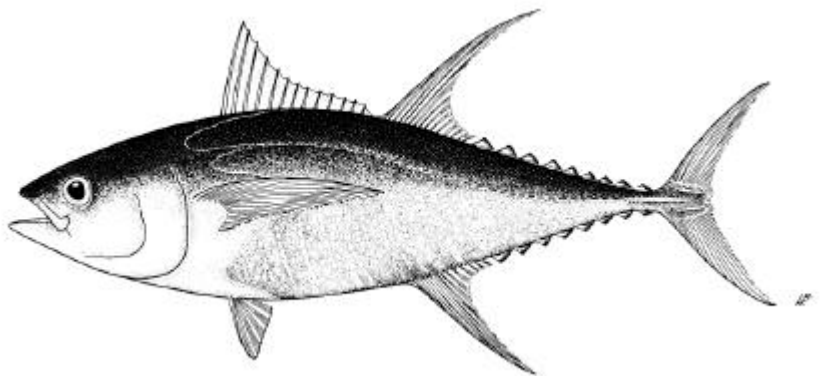


SCTB16 Working Paper

**NFR-21**

## **National Fisheries Report – Papua New Guinea**

(Prepared for the 16<sup>th</sup> meeting of the Standing Committee on Tuna and Billfish, Mooloolaba, Queensland, Australia, 9<sup>th</sup> –16<sup>th</sup> July, 2003)



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## 1. Background

PNG's EEZ, 2.4 million km<sup>2</sup> in extent, is one of the largest and more productive in the Western and Central Pacific Ocean. Industrial scale fisheries for tuna and associated species have operated since the 1950s, and in certain years, around 10% of the global catch of the main market species of tuna has been taken within the PNG EEZ. The tuna fishery is the largest of PNG's fisheries and represents a balance of both domestic industry development and foreign (DWFN) access arrangements.

Currently, domestic longline vessels and purse seine vessels - domestic, locally-based foreign and foreign access - operate under various arrangements. A large domestic pole-and-line fishery operated in the past but has not been active since 1986.

Since 1999, the development of the tuna fishery has been guided by a National Tuna Fishery Management Plan which establishes an overall management structure, and an application framework for the longline, purse seine and pole-and-line fisheries, including licence limits and total allowable catches (TACs). The Plan is currently undergoing its first revision, to take account of developments in the past four years.

The PNG purse seine fishery operates within the guidelines of several important regional and sub-regional arrangements eg PNA, Palau, and FSM Arrangements. The entry into force of the Western and Central Pacific Fisheries Convention, with many implications for regional and national tuna management, is anticipated.

Under the present Government's export-driven economic growth strategy, onshore investment in tuna processing for export is being actively encouraged. Foreign and domestic access by purse seine vessels is, as a result, increasingly linked to commitment to onshore investment, preferably in the form of tuna processing.

## 2. Total catch for all species and gears combined

The estimated total catch by all vessels fishing in the PNG EEZ for the past five years (1998-2002 inclusive) is shown in Table 1, and is comprised for the most part of purse seine catches (> 98% of the total catch). The considerable inter-annual variations seen in these catches are the result of both large scale environmental events (ENSO) affecting surface tuna availability in the PNG EEZ (higher in La Nina years such as 1995 and 2000) and changes in access arrangements (eg no access with two major distant water fishing nations (DWFNs) during 1999). The average annual purse seine catch in the EEZ has been around 180,000t during this recent five-year period, roughly 20% of the regional purse seine catch.

**Table 1 Total catch by all vessels fishing in PNG waters**

(Source: Purse seine - SPC raised data (BEST) from logsheets and landings data; longline - NFA logsheet data; incomplete but including catches by tuna and shark longliners; some by-catch included)

Year	1998	1999	2000	2001	2002	Historical high
Purse seine	175,593	124,855	280,444	160,710	166,356	368,763 (1991)
Longline	928	1,093	1,561	2,289	3,819	19,584 (1978)
Pole&line	0	0	0	0	0	74,649 (1974)
<b>TOTAL</b>	<b>176,521</b>	<b>125,948</b>	<b>282,005</b>	<b>162,999</b>	<b>170,175</b>	

The purse seine catch in the EEZ by domestic vessels, and foreign vessels based in PNG, the latter now numbering over 25 in total, has increased steadily since the establishment of the Madang cannery in 1997, and through more recent association with onshore commitments (Table 2). It is now over 40% of the total purse seine catch in the EEZ and is expected to increase further as new onshore developments come on stream and concurrently, bilateral access arrangements are accorded lower priority.

**Table 2. Catch by domestic and locally based foreign purse seine vessels in PNG waters** (Source: NFA logsheet data)

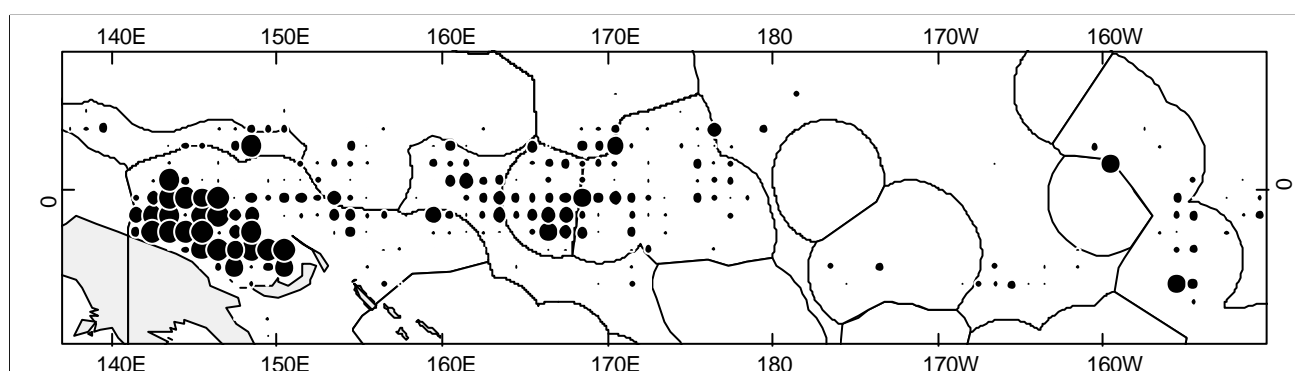
Year	1998	1999	2000	2001	2002
Catch (mt)	35,794	31,825	52,184	53,178	72,275

The locally-based foreign vessels operate widely throughout the WCPO, mostly under FSM Arrangement licences. The total catch by these PNG-associated vessels in the WCPO exceeded 120,000t in 2002 (Table 3), having increased steadily from just over 1,000t in 1994 (SPC Yearbook 2001). Figure 1 shows the wide distribution of the WCPO catch by these vessels.

**Table 3. Catch by domestic and locally-based foreign purse seine vessels in the region** (Source: SPC Yearbook (1998-2001): NFA logsheets (2002))

Year	1998	1999	2000	2001	2002
Catch (mt)	50,115	40,060	68,928	93,153	123,100
Vessels	13	17	20	24	27
CPUE	22.2	21.4	25.1	21.5	n/a

**Figure 1. Distribution of catch by PNG-associated purse seine vessels, 2002**



### 3. Fleet structure

#### *Domestic longline*

Since 1995, participation in the PNG longline fishery, under a domestication policy, has been restricted to national or citizen companies, with limited allowance for dry charter of additional foreign vessels. Although the fishery began primarily as a fresh chilled tuna fishery, some vessels with freezer capacity increasingly targetted shark, beginning on a large scale in 1997. Since 2002, a distinct shark longline fishery has been recognized, with separate statistical arrangements and monitoring activity

assigned to this fishery. Under the Shark Longline Management Plan, effort limits (vessel numbers and hook numbers) and a TAC have been established. Shark catches by the tuna longline fishery are also to be accounted for under the Plan.

During 2002, 40 tuna longline and 10 shark longline licences were issued, though not all of the licensed tuna longline vessels were active. There were no longer any chartered foreign vessels, these all having changed to PNG flag prior to 2002.

During 2003, total tuna longline vessel numbers have remained stable, with a limit of 9 on shark vessels, although individual tuna longline vessels continue to enter and leave the fishery

A trial handline fishery involving two Philippine vessels (bancas or pump boats) commenced in December 2002; interest in this fishing method, considered part of the longline/midwater fishery, is growing.

#### *Domestic purse seine*

Seventeen (17) purse seine vessels are regarded as domestic. Eleven of these are not PNG flag vessels but are associated with the tuna cannery, and land all their catch there. Most are small-medium sized vessels which fish in association with FADs, transfer catch to carrier motherships at sea, and take most of their catch within archipelagic waters.

#### *Locally based foreign purse seine*

Eight larger vessels, mostly flagged in Vanuatu and operating widely throughout the region under FSM Arrangement licences (Figure 1), were locally based during 2002 (11 in 2003), and are associated with present or planned onshore processing developments. They typically take around 30% of their catch in PNG waters. The number of vessels in this category may be expected to increase in future years.

#### *Foreign access purse seine*

PNG currently has bilateral purse seine access agreements with China, Korea, Taiwan and Philippine companies, as well as being a signatory to the USMLT. A total of 122 foreign purse seine vessels is currently licensed (Table 4) with these fleets taking varying proportions of their regional catch in PNG waters. Vessels of other parties to the FSM Arrangement also fish in PNG waters to a limited extent.

**Table 4. Number of licensed vessels by category fishing in PNG waters, 1998-2003.**

(Source: NFA licensing database; vessel numbers are for calendar and include replacements; longline vessel numbers include some inactive vessels; two handline vessels included in longline numbers for 2002/2003)

Year	Longline (tuna)	Longline (shark)	P/seine (local)	P/seine (locally based)	P/seine (bilateral access)	P/seine (USMLT)	P/seine (FSM non PNG)	TOTAL
1998	21	7	11	1	77	41	5	163
1999	34	13	12	5	17	38	6	125
2000	36	21	15	5	80	35	8	198
2001	39	12	19	5	80	35	11	201
2002	40 (+2)	10	19	8	84	32	15	210
2003	39 (+2)	9	18	11	80	26	16	201

#### 4. Catch by species by gear type

##### *Longline (tuna)*

There has been no licensed access by DWFN longline vessels to PNG waters since 1987, with a peak historical catch of nearly 20,000t (1978) achieved by Japanese vessels during this earlier period. Domestic longline activity started in 1995, following the introduction of the domestication policy.

Prior to 2001, logsheet coverage of the domestic fishery has been poor and catches are difficult to estimate with any confidence. Whilst this situation is improving, coverage has remained seriously incomplete until recently. Table 5 summarizes logsheet data held for all longline vessels (tuna and shark), since they were not separated until 2002.

Raised estimates of the tuna longline catch for 2002 from available logsheet data indicate a total catch of 2,650t (all species), of which 1,832t yellowfin, 368t bigeye and 159t albacore.

The catch is thus dominated by yellowfin (70% of the total catch and 80% of the tuna catch) with lesser catches of bigeye. Small quantities of albacore are taken, mostly in the Coral Sea. With tuna comprising close to 85% of the catch by number and weight, levels of by-catch are low, based on observer data, with shark around 6% or less, and billfish 9%. Other species typically comprise less than 1% of the catch.

Catch rates have generally been much lower than the Japanese historical catch rates, but are steadily improving as targetting yellowfin and bigeye becomes more effective. Most of the catch is taken in the Coral and Solomon Seas. The optimal fishing areas, in terms of catch rates and bigeye proportion in the catch, are in the north of the EEZ. Distant from the principal ports of Port Moresby and Lae, these waters remain lightly fished, and the lack of activity there contrasts with the large catches in directly adjacent waters by foreign vessels.

**Table 5. Domestic longline catches**

(Source: Logsheet data held by NFA, known to be incomplete especially prior to 2001; shark and minor quantities of by-catch are included in the total)

	Effort ('00 hooks)	Albacore		Yellowfin		Bigeye		TOTAL	
		Catch	CPUE	Catch	CPUE	Catch	CPUE	Catch	CPUE
1998	11,008	70	0.29	322	1.11	28	0.08	959	1.63
1999	14,558	54	0.25	206	0.47	25	0.08	1,112	0.91
2000	23,885	100	0.22	532	0.68	118	0.19	1,562	1.32
2001	43,937	102	0.14	1,488	0.68	216	0.20	2,432	1.66
2002	58,879	136	0.14	1,738	1.09	324	0.24	3,819	1.75

Comparisons of logsheet and export data (Table 6) suggest that the logsheet coverage was around 80% in 2001 and close to complete in 2002, although not all the tuna catch is exported.

##### *Longline (shark)*

The fishery started on a significant scale in 1997, when vessels licensed as tuna vessels and with freezer capacity began targetting shark. This quickly expanded to over 20 vessels, although many of these did not fish for lengthy periods of time. Data coverage prior to 2002 is sparse (less than 30%) with poor facility on the existing

tuna logsheets to record shark catch. Shark and tuna catches taken by longline vessels targeting shark, now limited to nine, have been included in Table 5.

Estimates of the shark longline catch for 2002 from the available logsheet and landings data, indicate a total catch (all species) of 1,965t, with 1,531t of dressed shark (78%), and 119t of H & G tuna (6%). Billfish (12%) and various other fish species (3%) make up the remainder of the catch.

The main shark species taken, based on extensive observer data, are silky shark, silvertip, grey reef, black tip and oceanic whitetip, although species composition of the catch varies considerably by area.

Based on available export data, 1,329t of frozen shark meat (more than 2,000t whole weight of shark) was exported in 2002 (Table 6), suggesting that considerable and increasing quantities of shark are being processed and consumed locally.

**Table 6. Comparison of declared catch (logsheet data) and exports for tuna and shark taken in the longline fishery**

(Source : NFA data; tuna and shark catches dressed weight; shark whole weight equivalents are bracketed in export figures; 2002 figures are incomplete)

Year	TUNA			SHARK		
	Declared l'sheet catch	Chilled exports	Coverage as % of exports	Logsheets /landings catch	Frozen exports	Coverage as % of exports
1998	398	590	67%	426	793 (1,348)	54%
1999	285	679	42%	659	1,320 (2,244)	50%
2000	749	1,196	63%	585	1,747 (2,864)	33%
2001	1,504	1,822	83%	391	1,483 (2,521)	26%
2002	2,141	2,097	102%	1,531	1,329 (2,259)	>100%

*Purse seine (local and locally based foreign)*

The catch by local licensed and locally based foreign vessels in PNG waters continues to increase (Table 7), and exceeded 70,000t in 2002. It now makes up over 40% of the total purse seine tuna catch in the EEZ. Skipjack contributes around 70% of the declared catch by species, with yellowfin most of the remainder. The proportion of yellowfin in the declared catch has exceeded 30% in the two most recent years. Observer data suggest that the percentage of yellowfin and bigeye in the catch in associated sets may be even higher, as much as 60% of the total by weight from these sets. Most of the catch by the locally licensed vessels has been taken in association with anchored FADs; recent adoption of an FAD Management policy will see restrictions placed on FAD numbers and operations, due to resource and gear conflict concerns.

**Table 7. Domestic and locally based foreign vessel purse seine catch in PNG waters by species** (Source: Logsheets data - unraised)

	Vessels	Bigeye		Skipjack		Yellowfin		Other	TOTAL mt
		mt	%	mt	%	Mt	%		
1998	9	403	1	25,743	72	9,226	26	420	35,793
1999	13	319	1	22,850	72	8,562	24	94	31,825
2000	17	415	1	40,059	77	11,673	22	38	52,184
2001	22	278	-	34,366	65	18,462	35	72	53,178
2002	26	122	-	48,126	67	23,742	33	285	72,276

### *Purse seine (bilateral and multilateral)*

Of the foreign access fleets, only the Philippines fleet of ten vessels (an eleventh vessels is flagged in PNG but fishes elsewhere) consistently takes virtually all of its catch in the PNG EEZ, with the other fleets (Taiwan, Korea, China and US) taking varying proportions of their catch in PNG waters, higher in La Nina years. Table 8 shows the species breakdown of the Philippines catch since 1998; most of the catch is taken around FADs, with at-sea transshipment permitted for smaller vessels (<600t capacity). Several of the Philippines vessels have access agreements with other PINs but have not fished there to any great extent.

**Table 8. Purse seine catch by Philippine foreign access vessels**

(Source: SPC webpage data 1998-2001; NFA logsheet data for 2002)

	Vessels	Skipjack		Yellowfin		Others		TOTAL	
		mt	%	mt	%	mt	%	mt	CPUE
1998	12	32,071	73	10,793	25	990	2	43,563	12.59
1999	10	24,302	78	6,660	21	217	1	31,180	16.92
2000	9	27,677	78	7,008	20	768	2	35,453	18.86
2001	10	15,138	60	9,684	38	429	2	25,252	15.09
2002	11	18,891	71	6,968	26	778	3	26,723	(17.23)

The catch in PNG waters by other foreign fleets is shown below (Table 10). The Taiwanese and Korean fleets account for most of the catch. High catches were recorded during the La Nina year of 2000, but have declined since then. They are expected to be higher this year (2003) with the return of mild La Nina conditions in the early part of the year.

**Table 10. Purse seine catch, all species – other fleets**

(Source : SPC raised (BEST) data)

	Korea	Taiwan	USA	China	FSM (Non PNG)
1998	28,775	42,713	9,514	0	4,798
1999	2,717	28,959	12,545	0	8,234
2000	78,900	93,277	12,225	0	12,811
2001	17,748	43,734	14,433	1,325	4,360
2002	15,090	50,495	1,508	1,395	5,181

## **5. Monitoring**

### *Observer programme*

PNG operates a significant observer programme with monitoring and compliance functions, and funded by a combination of access agreement levies and direct cost recovery. Observers are stationed at major ports and landing points in the country, under the supervision of senior observers, and provide coverage of the purse seine fishery (domestic and foreign), the longline fishery (tuna and shark), as well as transshipment of purse seine catch to carrier vessels/mother ships, and FAD deployments. Non-tuna fisheries (prawn) and trial fishing operations also receive observer coverage.

44 trained observers are currently available for deployment and made 122 trips, totalling 4,098 sea days, in 2002. Purse seine trips account for 70% of this coverage. Table 11 summarizes details of the observer coverage achieved during 2002. Early in 2002, the decision was taken to reduce observer coverage on mothership

operations and alternatively target 100% coverage of purse seine vessels involved in the mothership operations. This has yet to be fully implemented.

Incident reports are filed by observers where compliance infractions occur and may lead to enforcement action. The biological data collected are sent to SPC/OFP for entry and verification for incorporation into regional databases. Biannual summaries for national application will be produced in the near future with SPC assistance.

**Table 11. Observer activity summary for 2002**

(Source: NFA observer data)

Fishery/activity	Target coverage	Fleet size (vessel no.)	No. of trips	No. of sea days
PNG purse seine <sup>1</sup>	100%	6	13	564
Phils purse seine <sup>2</sup>	100%	21	48	2,075
Foreign p/seine	5%	122	10	330
Phils reefer			9	271
PNG reefer/m'ship			2	64
Tuna longline	5%	40	18	357
Shark longline	20%	9	2	95
FAD deployment	100%			12
Other fisheries (including trial fishing)	100% (trial fishing)		20	342
<b>TOTAL</b>			<b>122</b>	<b>4,098</b>

<sup>1</sup>Vessels flagged in PNG and operated by PNG companies

<sup>2</sup> Philippine-flagged vessels operated by PNG or Philippines companies

Port sampling activity was re-established during 2002, to gather information primarily on size and species composition of landed catches. 15 port samplers are stationed in ports throughout the country. 44 purse seine and 321 longline unloadings were sampled during 2002.

## 6. Market destination of catches

### *Domestic longline (tuna)*

The majority of the fresh chilled tuna catch (yellowfin and bigeye) is exported by airfreight to markets in Australia and Japan. Exports have increased steadily since 1994 and based on available records, exceeded 2,000t dressed weight (est. 2,400t whole weight), valued at over USD 8 million, for the first time in 2002 (Table 12). Frozen tuna (mostly albacore, around one hundred tonnes per year) is also exported. Smaller amounts of lower grade tuna and by-catch species (wahoo, mahi, some shark) are sold on local markets, and some sharkfin is (mostly frozen) exported.

### *Domestic longline (shark)*

Shark meat has been exported since the fishery moved to a significant scale in 1998, with over 2,000t whole weight equivalent exported each year since then. During 2002, increasing amounts of shark meat were processed in PNG for sale to local food outlets.

Frozen sharkfin exports have been in excess of 100t since 2000.

Tuna caught by the shark longline vessels (approx. 6% of the catch by weight) is also exported frozen (several hundred tonnes per year).

### *Local licensed purse seine*

In each of 2000, 2001 and 2002, over 30,000t of frozen tuna was exported by the three local companies, representing around 50% of the total catch taken by these

vessels; 2002 figures were slightly down as the RD Cannery processed more of the catch by its vessels, and minor amounts were unloaded by one other company. As the Frabelle (PNG) loining plant/cannery comes onstream in Lae during 2003, this volume of unprocessed exports should decrease further during 2003.

Limited quantities of by-catch species and small fish are sold locally.

The local market for canned tuna, in addition to exports, has expanded rapidly, with annual sales in 2002 now worth K 33 million (over 5,000 tonnes whole fish equivalent).

#### *Locally based foreign purse seine catch*

All of the catch by these vessels is currently transhipped and exported, apart from small quantities unloaded to the RD cannery from time to time (< 1,000t in 2002). Much of the transshipment occurs in non-PNG ports. By the end of 2003, when the large (200t/day) SST loining plant in Wewak is expected to be operational, much of the estimated 50,000t taken by these vessels in PNG waters and beyond will be landed and processed in PNG.

#### *Foreign purse seine vessels*

All of the catch taken by foreign bilateral and multilateral access vessels is transhipped, some from PNG designated ports, and exported.

Unloading of by-catch during transshipment is encouraged.

## 7. Exports

Table 12 lists tuna fishery exports by main category and value for the period 1998-2002. The total value of tuna fishery related exports increased by 20% in 2002, to reach a record USD 63.2 million (close to K250 million); these figures may still be incomplete. The export figures do not include the value of tuna transhipped by PNG-based vessels.

Chilled tuna, as noted, is mostly exported to Japan and Australia, frozen tuna to Philippines, Japan and Taiwan, canned tuna mainly to the USA and European markets (Germany, Great Britain), with small quantities to MSG countries, and fish meal to Australia and Japan. Shark products are mostly exported to Taiwan.

**Table 12. Tuna fishery product exports by volume and value**

(Source: NFA records; values in USD; frozen shark and frozen tuna weights are dressed; the 2002 figures may be incomplete; dried shark fins are not included)

Product \ Year	Chilled tuna		Frozen tuna		Canned tuna		Fish meal		Shark meat (frozen)		Shark fins (frozen)		TOTAL (USD million)
	Mt	Value	Mt	Value	Mt	Value	Mt	Value	Mt	Value	Mt	Value	
1998	589	1.7	28,165	25.1	5,339	12.0	1,010	0.2	792	0.6	70	1.2	40.9
1999	679	2.2	29,122	14.5	6,710	12.3	260	0.1	1,320	0.9	80	1.0	31.0
2000	1,196	5.1	33,004	13.5	10,298	18.1	1,690	0.4	1,747	0.9	110	1.0	40.0
2001	1,822	8.0	30,613	20.2	9,667	17.1	1,419	0.5	1,483	0.8	138	1.1	47.7
2002	2,097	8.4	30,728	30.5	11,679	22.4	1,609	0.6	1,329	0.5	111	0.8	63.2

## 8. Onshore developments

### *Infrastructure*

Under the ADB Fisheries Development Project, two wharves to primarily support longline fishery development were planned for Kavieng and Lombrum (Manus) respectively. The former was completed in March 2003, with work started on an associated fish processing facility; the Manus wharf was due for completion in late

June, with onshore development (eg net repair facilities, longline base) likely to occur in association with the wharf. Manus is well placed with respect to access to Guam, a primary entrepot for fresh tuna to Japan.

Further wharves are planned under forthcoming fishery development projects in Lae, Daru and Alotau. An airport chiller facility (60t capacity), to allow consolidation and storage of chilled fish prior to export, is under construction in Port Moresby.

Net repair facilities are available in Lae and Madang (Vidar) and have been proposed for at least one other location.

### *Processing*

The RD tuna cannery, established in Madang in 1997, continues to enhance production capacity with daily throughput of 120t now being achieved. Plans have been announced for the construction of a second larger cannery at Vidar, north of Madang (200t/day), in association with a 2,000t cold storage facility.

Construction is proceeding on the South Seas Tuna Wewak loining plant (200t/day capacity), with completion scheduled for early November 2003.

Work has also started on the proposed Frabelle cannery (100t/day) in Lae, with the associated 600t cold storage and ice plant nearing completion.

## **9. Future prospects and developments**

Under the Government's export driven economic growth and recovery strategy, further onshore development is being encouraged, as a condition of access.

Approval for the construction of a second loining plant (60t/day) in Madang is in the final stages, and interest has been expressed in additional smaller plants in at least two other locations. Proximity to the resource seems to be becoming a major factor influencing investment in onshore processing facilities in PNG, along with the prospect of improved access to key markets.

Should all of these plants come to fruition, up to 175,000t of raw material per annum might be required. Assuming that at least one third of this might be sourced outside PNG waters, locally sourced material (125,000t) would still represent only about half of the projected sustainable yield from PNG waters, assuring sustainability of supply and leaving room for further expansion. Some projections see tuna export values reaching USD 250 million (K one billion) within the next five years.

Further development of the longline fishery is currently constrained by logistical factors, particularly freight availability and high freight costs, but the fleet nonetheless continues to expand. Access to foreign longline vessels is likely to continue to be denied if domestic vessel numbers begin to approach existing nominal limits (100 vessels total). The nominal longline TAC of 10,000t (yellowfin and bigeye) remains some distance off.

The future development of the handline fishery (which has attracted considerable interest) will be closely monitored and regulated, whereas artisanal tuna fishery development will be encouraged under forthcoming projects and as an adjunct to onshore developments.

The planned development of "frozen smoked" processing plants is seen as a positive development for the longline sector, as it will preclude in part the need for increasingly expensive airfreight.

Other opportunities for value-adding to tuna products exist, and landing of by-catch by all vessels landing or transshipping is being encouraged.

Prospects for continued development of the sector seem bright.