SCIENTIFIC COMMITTEE
EIGHTH REGULAR SESSION

7-15 August 2012
Busan, Republic of Korea

ANNUAL REPORT TO THE COMMISSION
PART 1: INFORMATION ON FISHERIES, RESEARCH, AND STATISTICS

WCPFC-SC8-AR/CCM-18

PAPUA NEW GUINEA

Scientific Committee
Seventh Regular Session

Bussan, Korea
07th -15th August, 2012

ANNUAL REPORT TO THE COMMISSION

PART 1: INFORMATION ON FISHERIES, RESEARCH AND STATISTICS 2011

PAPUA NEW GUINEA

Thomas Usu, Brian Kumasi, Leontine Baje

National Fisheries Authority,
Port Moresby, PNG.

Scientific data was provided to the Commission in accordance with the decision relating to the provision of scientific data to the commission by the 30th April 2011	**YES**

Summary

The Papua New Guinea (PNG) tuna fishery is made up of both the purse-seine and longline sectors with a small, but important handline sector. The longline and handline sector is a citizen-only activity and all vessels fish exclusively in the waters under PNG national jurisdiction. The purse-seine sector is a mix of both domestic and foreign access vessels. The domestic sector comprises the PNG flag vessels and PNG chartered vessels which support processing facilities onshore in PNG. While the PNG flagged vessels fish primarily in PNG waters, but occasionally in the adjacent high seas, the chartered vessels fish both in PNG waters and waters outside of PNG. Foreign vessels under access arrangements fish in PNG EEZ waters (but not territorial or archipelagic waters) whenever there is fish to catch.

Total catch in 2011 within PNG waters was 624,131 mt, an 11 % decrease from the 2010 catch of 702,969 mt. The decrease in total catch is attributed to the decrease in total fishing effort mainly by foreign purse seiners. The catch contribution was 67.7% by foreign vessels that fish under bilateral access arrangements, 27.5% from PNG chartered vessels (locally based foreign) and 4.3% from the PNG flag vessels. Small amount ≈0.5% is from the longline sector. All the catch from PNG Flag vessels was caught inside PNG waters as result of closure of the neighboring high sea pockets. The catch by PNG chartered vessels outside of PNG waters was 49,573 mt and was taken mainly in the waters of the other PNA member countries.

A total of 251 vessels were active in the PNG waters in 2011. Thirty-five (35) were longline and 216 were purse-seine vessels. Ten (10) of the 216 vessels were PNG flagged, 39 were PNG chartered and 167 were foreign vessels fishing under access arrangements. The total purse-seine effort in 2011 by foreign vessels was 14,648 days fishing and searching inside national waters, a 7.2% decrease from 15,796 days in 2010. Longline effort on the other hand increased from 62,605 hundreds of hooks in 2010 to 63,261 hundred hooks in 2011. Catch by purse-seine vessels in PNG waters were mainly on free school sets compared to associated sets. More vessels in the PNG national fleet have recently been concentrating more on free schools sets as a result of the PNA MSC requirements which saw increased catches of skipjack tuna.

Data collection in PNG is comprehensive with above 80% catch & effort data coverage for all fleets. For size and species composition data, PNG runs a port sampling program as well as an observer program that covers the vessels based out of PNG and foreign vessels fishing the PNG Fisheries Zone. The PNG Observer Program runs a program involving over 250 man/women with the aim to increase this strength to 400 observers over the next 3-4 years. Observer coverage on vessels fishing in PNG waters on average (2007 - 2011) ranges from 47% on foreign vessels to 91% on PNG flag vessels. PNG chartered vessels have a 62% observer coverage on average.

PNG is striving towards building its fishing industry; therefore fishing licenses are linked to onshore investment. At full capacity PNG is looking to processing all fish caught in PNG waters, back in PNG. The rights to fish in PNG are also linked to onshore investment.

Table of Contents

Summary 2
Table of Contents 3
1. Background 4
2. Flag State Reporting 4
2.1 Domestic Longline 4
2.2 Purse Seine 5
2.2.1 Domestic - PNG Flag Vessels 5
Catch 5
Effort 5
2.2.2 PNG Charted Vessels 7
Catch 7
Effort 8
3. Coastal State Reporting 10
3.1 Domestic Longline and Handline 10
3.1.1Tuna Longline 10
Catch 10
Effort 12
3.1.2 Shark Longline 13
Catch and Effort 13
3.1.3 Handline 15
3.2 Purse Seine – Foreign Vessels 15
Catch 15
Effort 16
4. Socio –Economic Factors 17
5. Exports 17
6. Onshore Developments 19
7. Future Prospects of the Fishery 20
7.1 Longline 20
7.2 Handline 20
7.3 Purse Seine 20
8. Tuna Fishery Data Collection System and Research 21
8.1 Logsheet data collection and verification 21
8.1.1 Catch, Effort and Size Data Coverage 21
8.1.2 Electronic Data Reporting 22
8.2 Observer Program 23
8.3 Port Sampling Program 23
8.4 Tuna Tagging Project 24
9. References 24
10. Attachments 25

1. Background

Tuna in the areas under Papua New Guinea (PNG) jurisdiction are caught by two main fishing methods, namely purse-seine and longline. The total annual catches have averaged around 475,000 mt per year between 2007 and 2009. This represents about 19% of the WCPO catch and about 11% of the global catch. Most of the catch (99%) is attributed to the purse-seine fishery. Purse-seining started in PNG waters in the early 1980s and has since intensified, with the 2010 catch being the highest on record (702,969 mt). The longline fishery started even earlier than the purse-seine fishery, originally only as access by foreign fleets. But in the mid 1990s a policy on domestication enabled the fishery to be a national activity only, hence doing away with access by foreign fleets.

The tuna fishery in PNG represents a balance of both domestic industry development and foreign distant water fishing nations (DWFN) access agreements. Domestic industry development is pursued by using a model whereby a fishing licence is granted on the condition that the vessels catch fish for processing facilities in-country. Vessels under this scheme are either re-flagged to PNG or are given incentives by way of reduced licence fees and allowing them to fish within archipelagic waters or sponsoring them to fish under the Federated States of Micronesia Arrangement (FSMA). So far only the Philippine and Vanuatu flagged vessels are under this scheme apart from the PNG flagged vessels. The mode of operation by the Philippine and Vanuatu flagged vessels differ in that the Philippine flagged vessels fish exclusively in PNG waters, including the archipelagic waters whilst the Vanuatu flag vessels fish widely including the waters of the other Parties to the Nauru Agreement (PNA).

The fishery is guided by the National Tuna Fishery Management Plan which establishes an overall management structure, and an application framework for all tuna fisheries, including licence limits and total allowable catches (TAC), gear restrictions and the use, deployment and limits to the number of Fish Aggregating Devices (FAD).

The purse-seine fishery operates within the guidelines of important regional and sub-regional arrangements such as the Parties to the Nauru Agreement (PNA), whose requirements are incorporated in the National Tuna Management Plan**.**

2. Flag State Reporting

This section reports activities by the national fleet in Western and Central Pacific Fisheries Commission (WCPFC) convention area including PNG's Exclusive Economic Zone (EEZ). The national fleet comprises domestic longline and purse seine vessels as well as purse seine vessels under charter arrangements.

2.1 Domestic Longline

Activities by the domestic longline vessels are reported under Coastal State Reporting, section 3.1 as the activities by these vessels are entirely inside waters under national jurisdiction. Section

3.1 also includes activities by a distinct shark longline fishery and a very small handline fleet. Although catch by the longline fleet is not reported in this section, it is still considered as part of the essential information required by the Commission.

2.2 Purse Seine

PNG manages a purse seine fleet made up of two categories; domestic vessels which fly PNG flag and Locally Based Foreign (LBF) vessels which are foreign flagged and whose activities is governed by charter arrangements with locally based companies. These vessels unload their catch to processing plants in the country and are supported with some form of incentives by the government.

The PNG Flag and half of the Chartered vessels, mainly Philippine flagged (except one which also fish in Solomon Islands), have been fishing primarily in the PNG EEZ. The other half of the Charted vessels mainly Vanuatu flagged fish throughout the PNA region under the FSMA licensing arrangements. A total of 49 purse seiners (10 PNG Flag and 39 Chartered) were actively fishing in the year 2011.

2.2.1 Domestic - PNG Flag Vessels

Catch

The overall catch estimates for 2011 by PNG flagged domestic vessels was 26,869.82 mt caught entirely in the PNG EEZ (Table 1). SKJ remains dominant comprising almost 68.4% of the catch, followed by yellowfin 30.9% while bigeye and other species (non-primary species associated with purse seine gear) barely making 1% of the catch. The overall 2011 catch is a further decline of 22.5% from 2009 (34,688.25 mt) and 3.9% from 2010 (27,972.30 mt). Catches of SKJ tuna in 2011 (18,365.1 mt), although was still lower than that of 2009 (21,238.38 mt), increased by 19.9% from 2010 (15,305.95 mt) while YFT and BET significantly decreased by 33.5% and 61.5% respectively. These differences in catch composition are mostly a result of the vessels concentrating their efforts on SKJ free schools.

Effort

A total of 10 PNG flag vessels (one more vessel than 2010) were actively fishing in national waters in 2011. The number of active vessels has been steadily increasing from 6 vessels in 2006. The total number of days spent by these vessels fishing and searching in 2011 was estimated at 1202, a 3% increase from year 2010 (1167 days) but still below 2009 effort of 1232 fishing days. Effort by these vessels has also been increasing since 2006 from 642 estimated fishing days (Figure 1). Most of effort is concentrated in the PNG EEZ and catches outside were mainly from the high seas pocket north of PNG. In 2011, all the fishing activity occurred in national waters as a result of the high seas pocket closure.

Table 1: Annual catch estimates (mt) for domestic purse seine vessels (PNG Flag) inside and outside of the PNG EEZ. Source: NFA database.

Species	Fishing Zone	Year				
		2007	2008	2009	2010	2011
SKJ	In EEZ	11,973.39	17,724.86	20,755.17	15,305.38	18,365.10
	Out EEZ	349.74	4.47	483.21	0.57	
YFT	In EEZ	8,064.76	13,226.06	13,123.97	12,498.85	8,311.98
	Out EEZ	162.96		56.37	0.21	
BET	In EEZ	106.08	70.80	212.52	97.32	37.50
	Out EEZ					
OTH	In EEZ	171.67	80.00	56.77	69.91	155.25
	Out EEZ	0.36		0.24	0.06	
TOTAL	In EEZ	**20,315.90**	**31,101.72**	**34,148.43**	**27,971.46**	**26,869.82**
	Out EEZ	**513.06**	**4.47**	**539.82**	**0.84**	-
WCPO Total		**20,828.96**	**31,106.19**	**34,688.25**	**27,972.30**	**26,869.82**

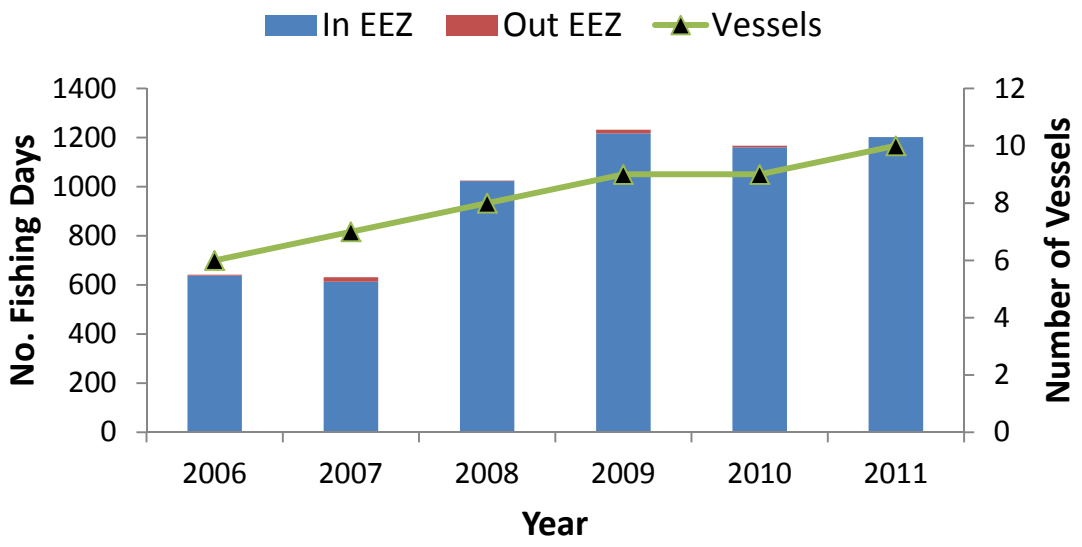

Figure 1: Distribution of fishing effort (number of fishing days) inside and outside of PNG EEZ by domestic purse seine vessels (PNG Flag) and the number of active vessels from 2006 – 2011. Source: NFA database.

Most sets in 2011 were done on free schools or unassociated sets (1043 sets) resulting in higher SKJ catches. Number of free school sets increased dramatically while FAD and log associated

sets decreased since 2007 in PNG waters following the FAD closure measures and recently the adoption of PNA MSC certified free-school caught SKJ tuna. A total of 171 sets were made on anchored FADs, 157 on drifting FADs and 134 drifting logs and debris in PNG waters. 19 sets were made on schools associated with whale sharks and other marine mammals (Figure 2a). Between 1999 and 2001 purse seine sets in other areas of the WCPO (outside PNG EEZ) were mainly on drifting logs. Beginning 2002 the number of sets outside PNG waters concentrated to anchored FADs with 151 sets in 2005. Since 2006 effort by PNG flag purse vessels outside PNG waters decreased and sets were mainly on free schools in 2007 (25 of 30 sets) and almost equal percentage between free schools, anchored FADs and drifting logs of the total (45) sets in 2009 (Figure 2b).

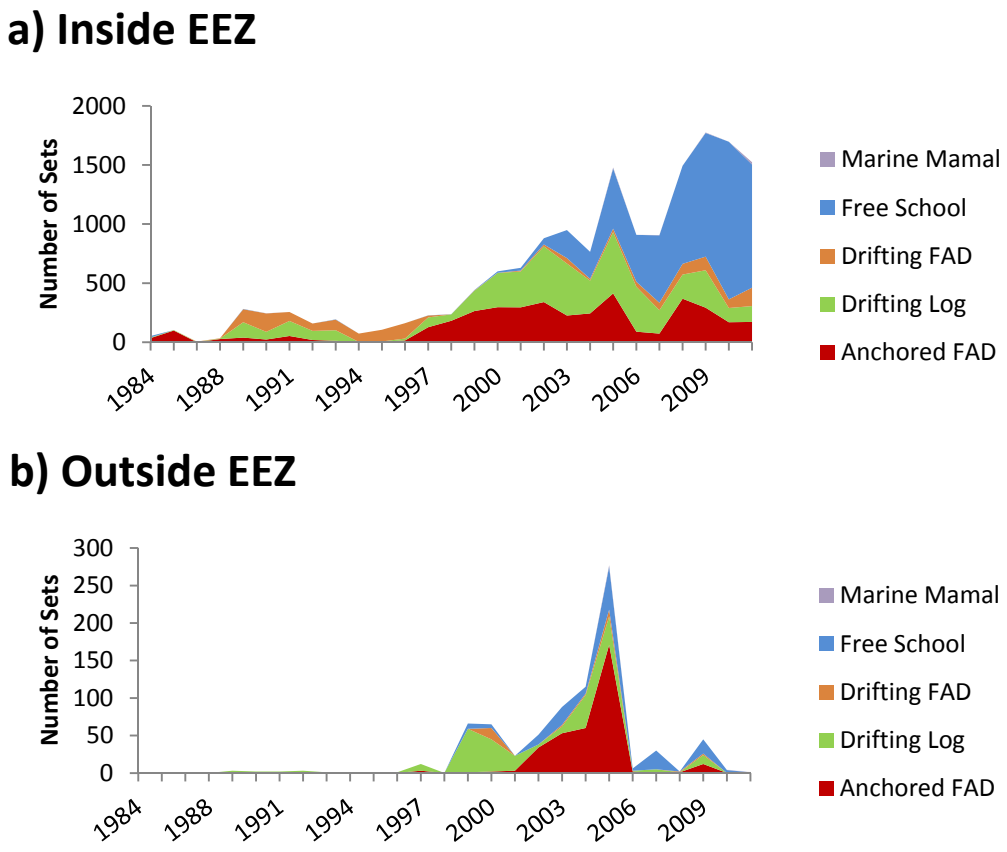

Figure 2: Number of sets by school association for PNG flagged purse seine vessels in the WCPFC convention area including PNG waters,. Source: NFA database.

2.2.2 PNG Chartered Vessels – Foreign Flag

Catch

The 2011 overall catch estimates by locally-based foreign (LBF) vessels in the entire WCPFC convention area was 171,888.86 mt. This was a slight decrease from 2010 (177,865.17 mt) and is

still below the 2006 and 2007 catch estimates (greater than 200,000 mt). Most of the catch, around 71%, was taken inside the PNG EEZ whereas 29% was in other EEZs in the WCPFC convention area in 2011, mainly waters of the PNA member countries. Catch inside the PNG EEZ (122,315.58 mt) were higher than 2010 (114,468.14 mt) while catches outside (49,573.28 mt) were lower by almost 14,000 mt from 2010 (Table 2). The catch increase inside PNG waters was largely due to a 15.7% increase in SKJ catches from 2010. Catch Estimates for Other non-primary species also increased both inside and outside the PNG EEZ by 753.25 mt and 1.75 mt respectively. Due to the high seas closure, no catches were taken from the pockets north and east of the PNG EEZ.

Table 2: Annual catch estimates (mt) for locally based foreign vessels (Foreign Flag) inside and outside of the PNG EEZ. Source: NFA database.

Species	Fishing Area	Year				
		2007	2008	2009	2010	2011
SKJ	In EEZ	98,359.40	85,672.52	69,606.64	84,198.79	97,387.41
	Out EEZ	69,180.00	48,556.47	64,467.80	52,793.80	44,888.10
YFT	In EEZ	26,019.78	26,259.35	25,432.53	29,337.94	23,406.18
	Out EEZ	10,195.15	18,348.49	8,045.00	10,414.40	4,400.70
BET	In EEZ	130.32	173.30	200.26	351.64	188.97
	Out EEZ	124.55	172.32	67.00	185.20	279.10
OTH	In EEZ	63.43	181.45	71.34	579.77	1,333.02
	Out EEZ	16.39	24.12	32.56	3.63	5.38
TOTAL	In EEZ	**124,572.92**	**112,286.62**	**95,310.77**	**114,468.14**	**122,315.58**
	Out EEZ	**79,516.08**	**67,101.40**	**72,612.36**	**63,397.03**	**49,573.28**
WCPO Total		**204,089.00**	**179,388.02**	**167,923.13**	**177,865.17**	**171,888.86**

Effort

The number of active Chartered vessels fishing both inside and outside of PNG waters in 2011 remained the same as in 2010 with 39 purse seiners. An estimated overall of 7,442 fishing days was spent fishing and searching in the WCPO by these vessels in 2011. This is another significant increase from 2010 (5,544 days). Most effort was spent in PNG waters (over 74% on average) than waters in other countries in the past 4 years. In 2011 5,476 fishing days were spent in PNG waters while 1966 days 26%) was distributed in other EEZs of PNA member countries (Figure 3).

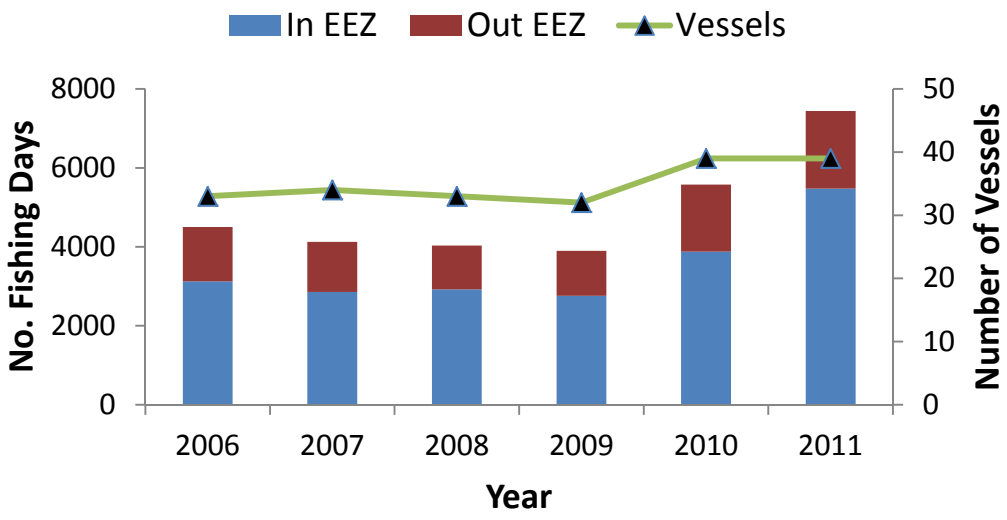

Figure 3: Distribution of fishing effort inside and outside the PNG EEZ by locally based foreign vessels from 2006-2011. Source: NFA database (unraised VMS).

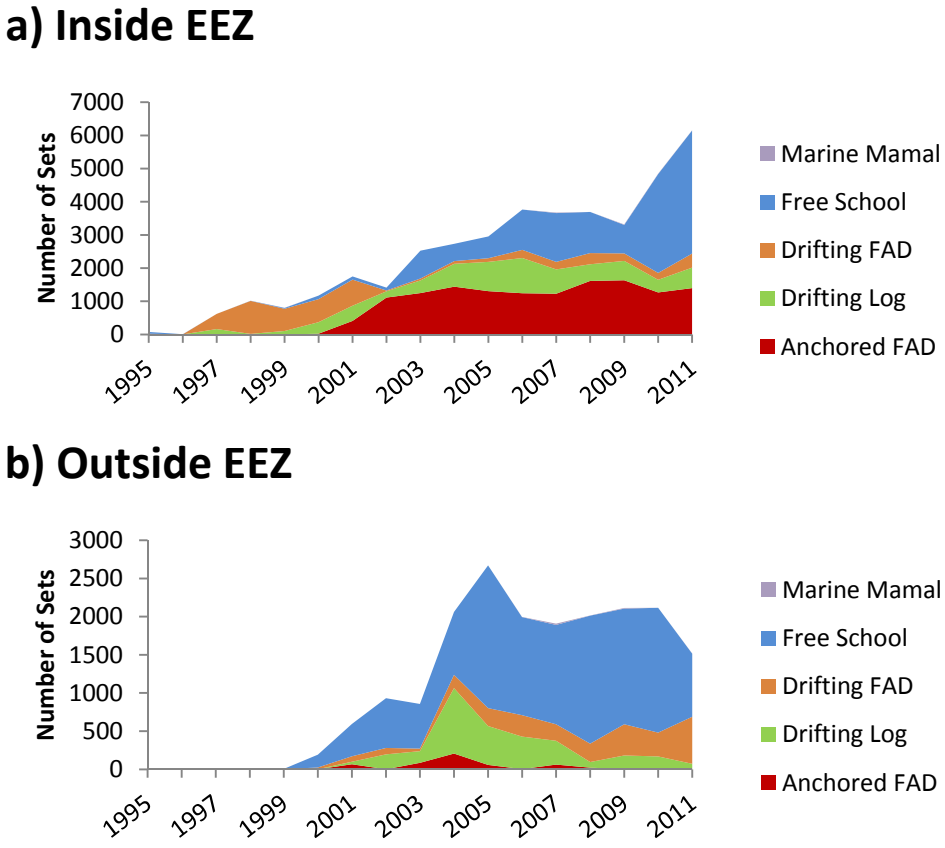

Figure 4: Number of sets by school association for PNG flagged purse seine vessels in the WCPFC convention area including PNG waters. Source: NFA database.

Total number of sets made by chartered purse seine vessels was the highest with 7677 sets, a 10% increase from 2010 (6964 sets). Sets inside PNG waters were mostly on associated schools with a large proportion on anchored FADs, an average of 1352 sets (45%) from 2002 to 2009. Although the number of associated sets (especially anchored FADs) remained fairly consistent, more sets were made on free schools as effort increased beginning 2006 (Figure 4a). A significant increase in free schools sets was seen in 2010 with 2985 sets (62%) following the introduction of PNA MSC requirements and 3709 sets (60%) in 2011. Sets outside PNG waters were mostly on free schools with an average of 1214 (67%) a shown in Figure 4b.

3. Coastal State Reporting

This section reports activities in waters under national jurisdiction by foreign fleets which comprise of tuna purse seine vessels. Domestic longline and a very small handline fishery are also reported in this section since all their activities are inside PNG waters.

3.1 Domestic Longline and Handline

PNG still manages an exclusive domestic tuna longline fleet under the current management plan which limits effort to 100 vessels setting 1200 hooks per set per day and catch to 10,000 mt per year based on the combined catch of yellowfin and bigeye tuna. All vessels fish entirely in PNG waters and do not fish waters beyond areas under national jurisdiction. All catch by these vessels is unloaded in the PNG and exported as frozen products. The domestic shark longline fishery is managed under a separate management plan and the very small handline is managed under set of guidelines.

3.1.1 Tuna Longline

Catch

Catch estimates by tuna longline vessels for 2011 in PNG waters was dominated by yellowfin (1,767 mt) and albacore (881 mt). Bigeye tuna made up 1% of the catch (35 mt) while billfishes, sharks and other species made up 5%, 4 % and 6% respectively. Billfishes that are caught by this fishery as bycatch are mainly black marlin, blue marlin, striped marlin and swordfish. The overall estimated catch in 2011 was 2,618 mt, a 24% decrease from the 2010 estimate which was 3427 mt (Table 3). A major decrease in catches was seen in Albacore (71%), Black Marlin (60%), Sharks (26%) and Striped Marlin (20%). There was also an 11% decrease in catches of yellowfin. Bigeye (50 mt) although increased by 42% from 2010 estimates was still below 2009 estimates of 62 mt and 2008 estimates of 197 mt which was the highest in previous 4 years. 2011 catch of Blue Marlin (123 mt) and other non-primary species (265 mt) was the highest since 2007.

Table 3: Annual catch estimates (mt) of primary species and effort estimate (hundred hooks) for PNG domestic tuna longline fleet in PNG waters. Source: NFA Database.

Year		2007	2008	2009	2010	2011
Effort HHooks		*59,681*	*42,805*	*36,574*	*62,605*	*63,261*
Catch (mt)	Albacore	1567	284	432	881	252
	Bigeye	109	197	62	35	50
	Yellowfin	1511	2254	1466	2006	1767
	Black Marlin	24	13	14	25	10
	Blue Marlin	55	39	43	97	123
	Striped Marlin	13	4	6	10	8
	Swordfish	12	17	24	44	44
	Shark	43	96	99	134	99
	Others	37	37	71	195	265
	Total Catch	**3371**	**2941**	**2217**	**3427**	**2618**

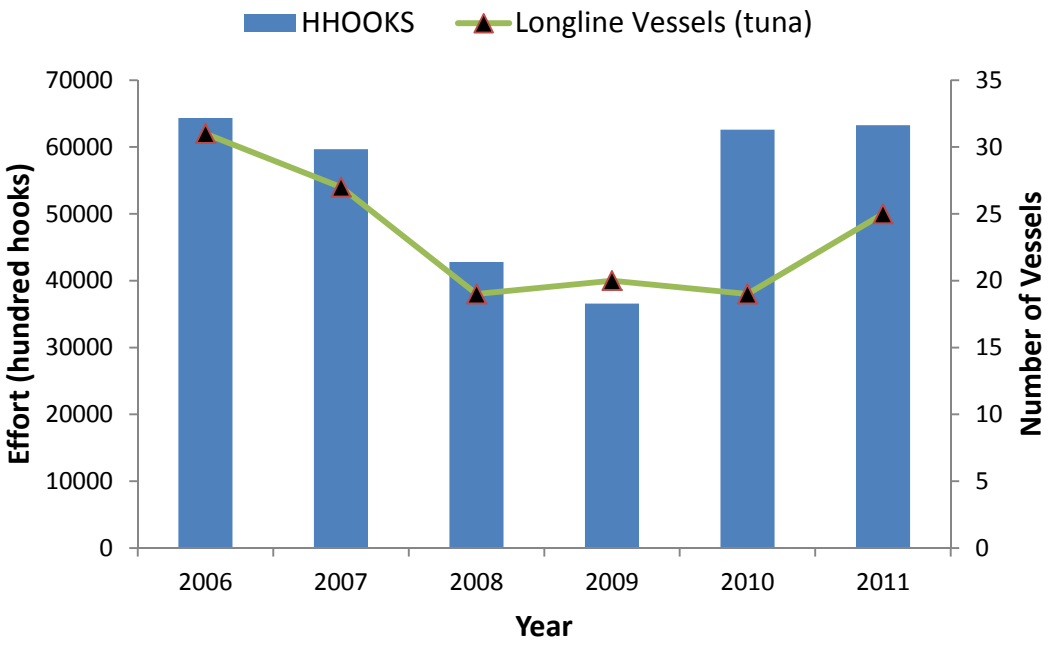

Figure 5: Shows the number of hooks deployed by domestic tuna longline vessels and the number of active vessels fishing in PNG waters from 2006-2011. Source: NFA database.

Effort

The number of hooks deployed by tuna longline vessels declined from 64,344 hundred hooks in 2006 to 36,574 hundred hooks in 2009 (Figure 5). This decline was related to the decline in the number of tuna longline vessels from 31 vessels in 2006 to 19 vessels in 2008, and 20 vessels in 2009. In 2010 a total of 19 tuna longline vessels operated by 3 local companies were actively fishing in PNG waters deploying a total of 62,605 hundred hooks. This is a 71% increase in the number of hooks from 2009 estimates almost reaching the effort level for 2006. 63,261 hundred hooks were deployed in 2011 which was slightly higher than 2010 but still below the 2006 level. This followed the increase in the number of active tuna longline vessels to 26 fishing in PNG waters (Figure 5).

The main fishing area stretches from the Solomon Sea down to the Coral Sea and east of the Gulf of Papua, all inside areas under national jurisdiction as shown by the catch distribution plot in (Figure 6). These areas have been exempted from FAD deployment mainly to avoid gear conflicts between longliners and purse seiners.

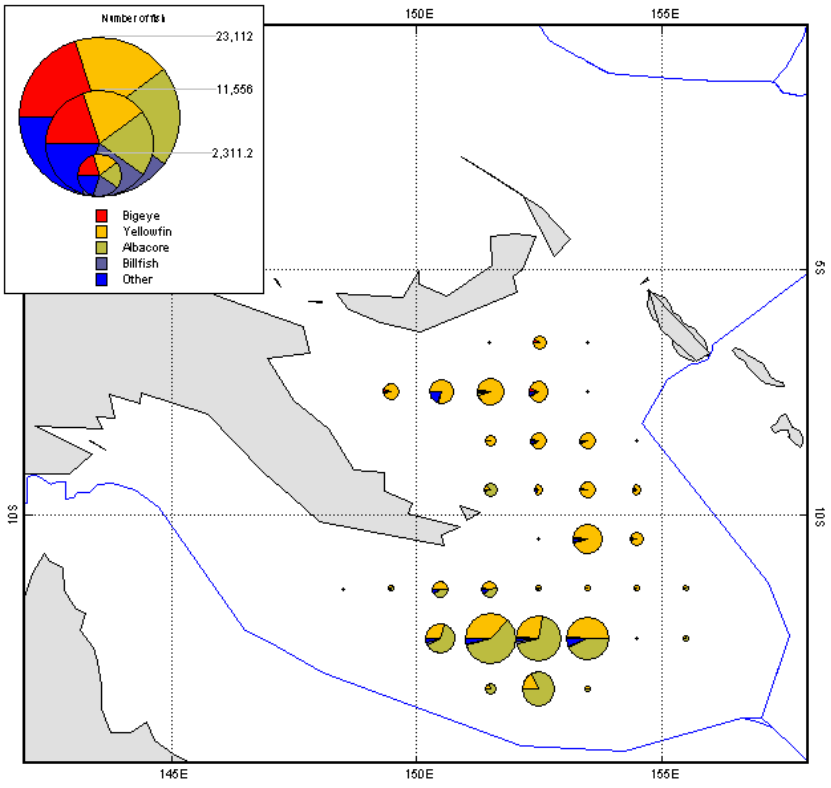

Figure 6: Domestic tuna longline catch distribution and composition of primary species in PNG waters. Source: SPC (CES).

3.1.2 Shark Longline

The shark longline fishery is managed under a separate management plan from the tuna longline fishery. The fishery is limited to 9 vessels, setting 1,200 hooks per day with a total allowable catch of 2,000 mt dressed weight per year. All vessels in this fishery fish only in PNG waters. The number of shark longline vessels increased from 1 active vessel in 2000 to 9 active vessels in 2003. These were mainly tuna targeting boats that were converted into shark targeting boats. The number of sharks caught also increased from 154 (2000) to 50,229 (2009) respectively. In the last 4 years, an average of 7 vessels was actively fishing with an average catch of 56,528 sharks.

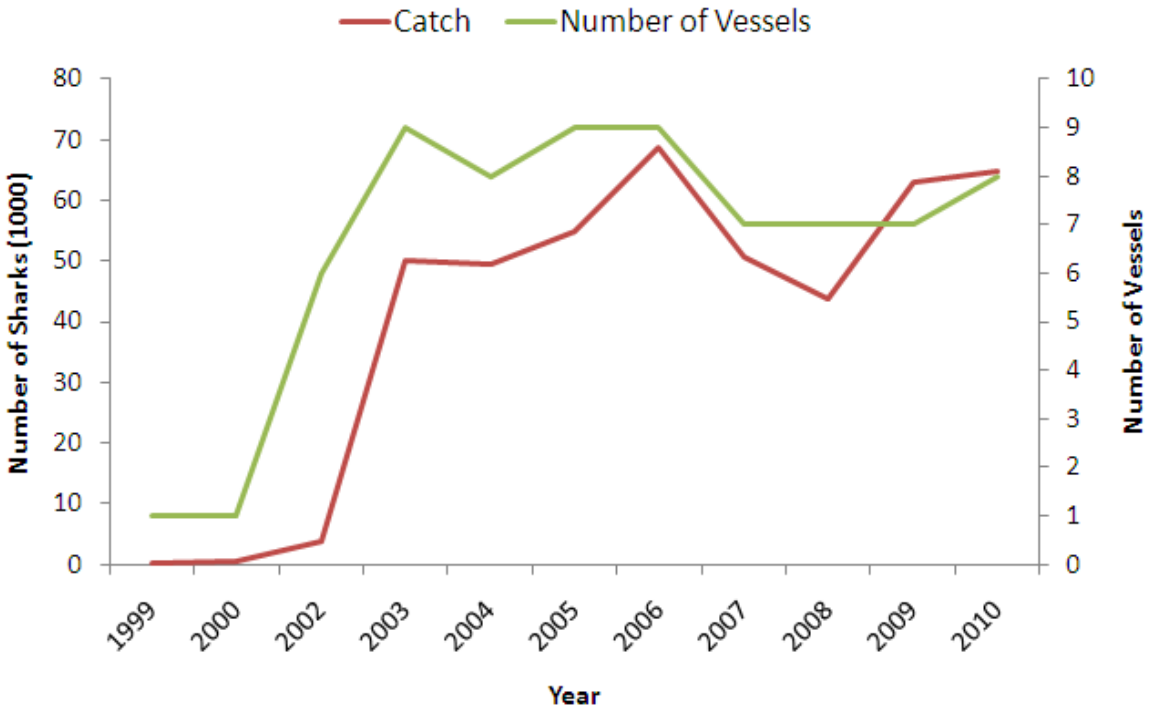

Figure 7: Catch estimate of sharks and the number of shark longline vessels from 1999 – 2010. Source: NFA Database.

Catch and Effort

A total of 9 shark longline vessels were active in 2011 with a high overall effort of 27,963 hundred hooks. The total catch estimate in 2011 was 1,947.22 mt of which shark species alone was a high of 1,479.66 mt (76%). Silky shark was the dominant species in this fishery with a catch of 1,292.90 mt (92%). Catches of blue sharks although increased in 2011 (18.93 mt) by 85% from 2010, the catch declined dramatically from 256.45 mt in 2007 to 10.21 mt in 2010. Catch estimates of Blacktipped Reef Shark have been increasing from 6.89 mt in 2008 to 43.98 mt in 2011 while Hammerheads, Grey Reef, and Oceanic White Tip sharks decreased by 43%, 65% and 45% respectively from 2010. Blacktip shark was very low with 2.81 mt compared to 70.80 mt caught in 2007.

Table 4: Annual catch estimates (mt) of shark species and effort estimate (hundred hooks) for PNG domestic shark longline fleet in waters under national jurisdiction. Source: NFA Database.

Year		2007	2008	2009	2010	2011
Effort (HHooks)		*15,605*	*14,232*	*21,560*	*22,790*	*27,934*
Catch (mt)	Silky Shark	838.77	832.32	949.17	907.26	1,292.90
	Blue Shark	256.45	61.69	14.46	10.21	18.93
	Hammerhead Shark	32.93	18.69	36.60	39.15	22.34
	Blacktip Shark	70.80	7.62	28.44	18.93	2.81
	Blacktipped Reef Shark	21.31	6.89	13.62	19.75	43.98
	Grey Reef Shark	24.35	16.96	7.26	23.87	8.42
	Oceanic White Tip	15.72	3.43	12.22	12.90	7.15
	Tiger Shark	3.47	3.62	9.05	8.76	2.15
	Silvertip Shark	4.29	1.23	2.85	6.37	0.45
	Galapagos Shark	1.21	0.20	1.23	0.99	0.29
	Shark Unidentified	94.94	99.11	68.25	71.72	80.25
	SHARK TOTAL	**1,364.22**	**1,051.74**	**1,143.14**	**1,119.90**	**1,479.66**
	Tuna Total	50.47	118.39	127.83	145.15	183.67
	Billfish Total	136.33	129.47	112.93	115.06	196.22
	Others Fish Species	44.43	31.17	45.33	80.60	87.69
	OVERALL TOTAL	**1,595.44**	**1,330.77**	**1,429.23**	**1,460.71**	**1,947.22**

Around 24% of the overall catch estimate by shark longliners in 2011 were species other than sharks which include tuna (183.67 mt) especially yellowfin, bigeye and albacore: billfishes (196.22 mt), primarily blue marlin and swordfish; and other fish species (87.69 mt) (Figure 8).

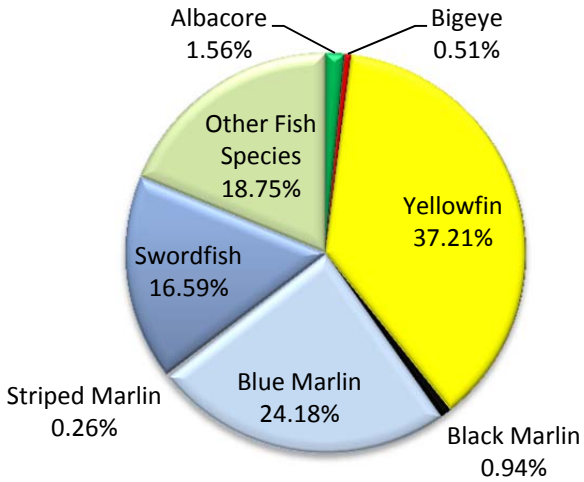

Figure 8: Species composition of species other than sharks from 2011 shark longline catch estimates (n = 467.58 mt). Source: NFA database.

3.1.3 Handline

Since the trial of handline fishery in 2005, the number of pumpboats reduced from 10 to 5 vessels in 2009 (Kumoru, 2010). Although there is some growth potential for this fishery, most of the vessels failed to continue fishing mainly due to lack of proper business management, and the high operational cost for artisanal operators during its inception. Currently, the small handline fleet of about 5 vessels is operating in waters around Madang and Morobe provinces. The vessels are solely owned and operated by local fishermen. Catch by these vessels, which do not normally exceed 10 mt (estimate) per year, is sold to processing companies as well as local supermarkets.

3.2 Purse Seine - Foreign Vessels

Foreign vessels that fish in PNG waters are mainly purse-seine gear and are licensed under the conditions of access agreements between PNG and their company, fishing association or home party state and also include vessels fishing under the terms of the US Treaty and FSM Arrangement.

Catch

Estimated catch from logsheets by foreign purse seine vessels in 2011 was 427,669.56 mt inside the PNG EEZ. Catches of all primary species SKJ (340,949.81 mt), YFT (83,235.98 mt) and BET (3,044.20 mt) decreased by 18.3%, 38.8% and 58.7% respectively from 2010 estimates (Table 5). The decline was a result of a lower effort relative to a drop in active foreign purse seine vessels fishing in PNG waters.

Table 5: Annual catch estimates for foreign purse seiners fishing in PNG waters from 2007-2011. Source: NFA Database.

Year	SKJ	YFT	BET	OTH	Total
2007	265,527.07	49,612.73	2,297.69	402.30	**317,839.79**
2008	254,503.34	70,908.28	3,441.30	307.93	**329,160.85**
2009	213,817.67	44,936.72	3,374.79	321.11	**262,450.29**
2010	417,035.90	135,979.36	7,365.61	149.52	**560,530.39**
2011	340,949.81	83,235.98	3,044.20	439.67	**427,669.66**

Effort

The current high catch level is a result of an increase in effort directly related to the increase in foreign purse seiners actively fishing in PNG waters (Figure 9). In 2011, a total of 167 purse seiners spent a total of 14,648 days fishing and searching inside the PNG EEZ - the number of vessels decreased by 9 from 176 and the number of fishing days by 7.3% from 15,648 in 2010. The decline was attributed to the reduction of vessel numbers fishing under the US Treaty and the FSM Arrangement (Figure 9).

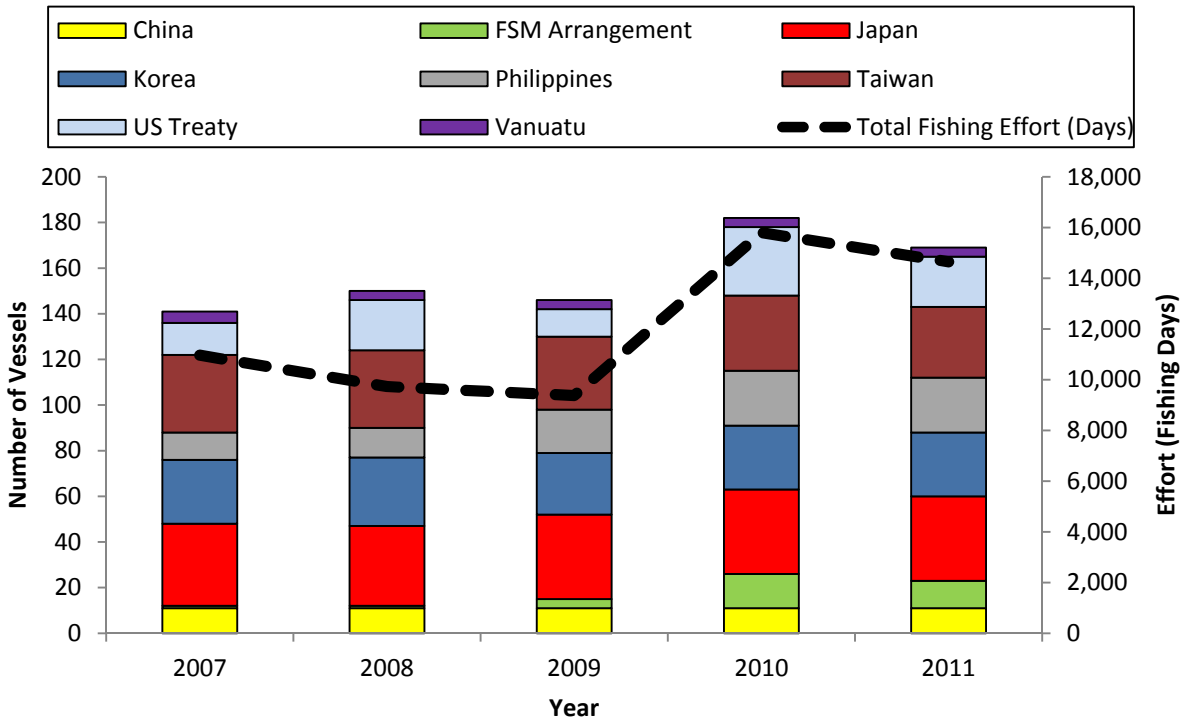

Figure 9: Number of fishing days and vessels for foreign purse seine fleet actively fishing in PNG waters in 2007-2011. Source: NFA database.

Free school sets were always higher by foreign pursers fishing in PNG waters since 2000 followed by sets made on drifting logs and then drifting FADs (Figure 10). In 2008 more sets were made on drifting FADs than drifting logs. In 2011, total number of sets by foreign vessels (18,781) comprised of 13,609 sets on free schools, 3,249 sets on drifting FADs, 1,299 sets on drifting logs and 529 sets on anchored FADS. Fishing on anchored FADs was always low at an average of 308 sets per year as not all foreign purse seiners have the privilege to deploy FADs in PNG waters unless they support companies with onshore investments. Until 2009 the number of sets on anchored FADs increased to 610 sets and 673 set in 2010.

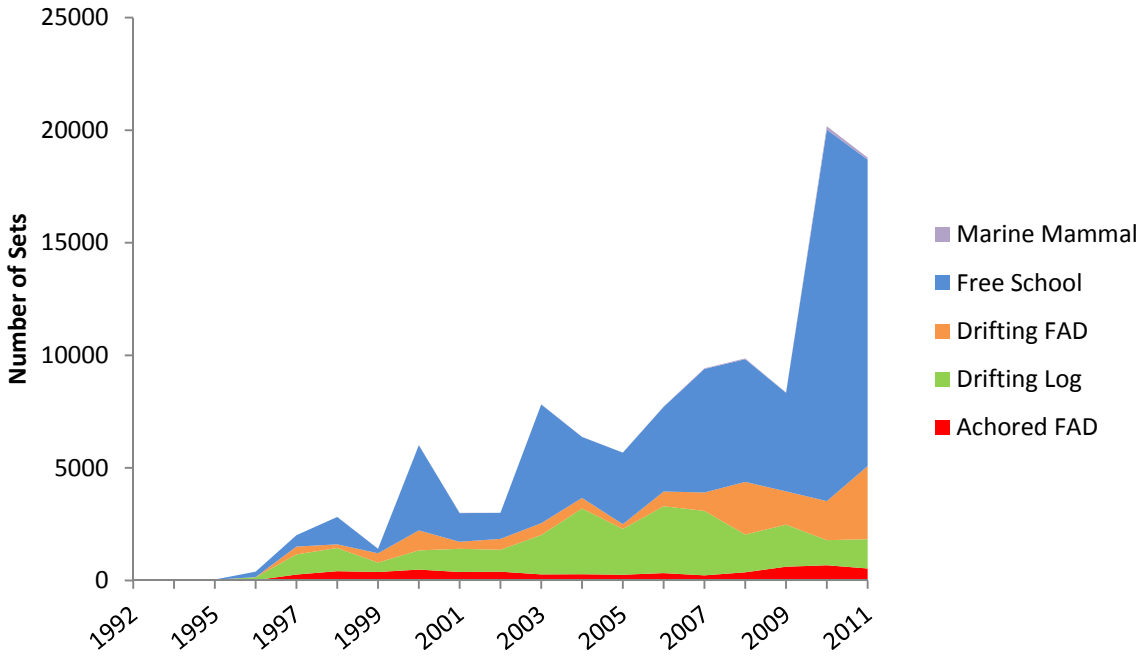

Figure 10: Number of sets by school association for Foreign purse seine vessels in the inside PNG waters in 2011. Source: NFA database.

4. Socio – Economic Factors

Papua New Guinea is focused on building its domestic tuna industry to an extent where the generated revenue can offset that currently obtained from bilateral access fees. The government's main objective is to maximize the benefits from tuna resource to citizens and promote the involvement of nationals in the industry. A growth in the industry would provide an increase in employment opportunities, increased foreign exchange earnings for the country and direct and indirect spin-off benefits among other benefits of value-adding the tuna resources. Currently, the industry supports almost 7,000 people in direct employment and almost 2,000 indirect employments in the country of over 6 million people. New commitments and investments would triple these figures (See Section 7 on onshore developments).

5. Exports

The value of tuna exports have steadily been increasing together with quantity in the last 6 years peaking at USD 149 million in 2008 (Kumoru, 2010). This growth is in line with the country's industry development aspirations. The overall estimated value of processed exports for tuna and other associated species in 2011 was over USD 164 million.

Table 6 shows the value and quantity of each processed product by species associated with catches in the tuna fishery in 2011. The highest value was from frozen products, at USD 93 million of mainly skipjack tuna (30,832mt,) and high priced yellowfin (22,870 mt). Exports of

canned products were valued at a total of over USD 64 million which was mostly skipjack (15,390.63 mt). Substantial earnings were also generated from frozen albacore, and billfishes. Fresh chilled exports were basically yellowfin, bigeye and billfishes products while cooked and dried products were from mainly from unspecified sources.

Table 6: Export products by species in 2011. Source: NFA Database

Product	Quantity/ Value	Species								Grand Total
		ALB	BET	SKJ	YFT	YFT/BET	Billfishes	Others	Unspec.	
Canned	Thousand MT	-	-	15.39	0.21	-	-	0.02	-	**15.62**
	Million USD			63.20	0.81			0.08		**$ 64.09**
Dried	Thousand MT	-	-	0.06	-	-	-	-	4.98	**5.04**
	Million USD			0.04					3.83	**$ 3.86**
Fresh chilled	Thousand MT	-	0.07	-	0.54	-	0.02	-	-	**0.64**
	Million USD		0.38		2.85		0.11			**$ 3.33**
Frozen	Thousand MT	0.47	0.03	30.83	22.87	0.02	0.76	0.11	0.27	**55.37**
	Million USD	0.75	0.04	39.84	51.77	0.03	0.62	0.09	0.05	**$ 93.18**
Total	**Thousand MT**	**0.47**	**0.10**	**46.28**	**23.63**	**0.02**	**0.78**	**0.13**	**5.26**	**76.67**
	Million USD	**0.75**	**0.43**	**103.08**	**55.42**	**0.03**	**0.72**	**0.17**	**3.87**	**$ 164.47**

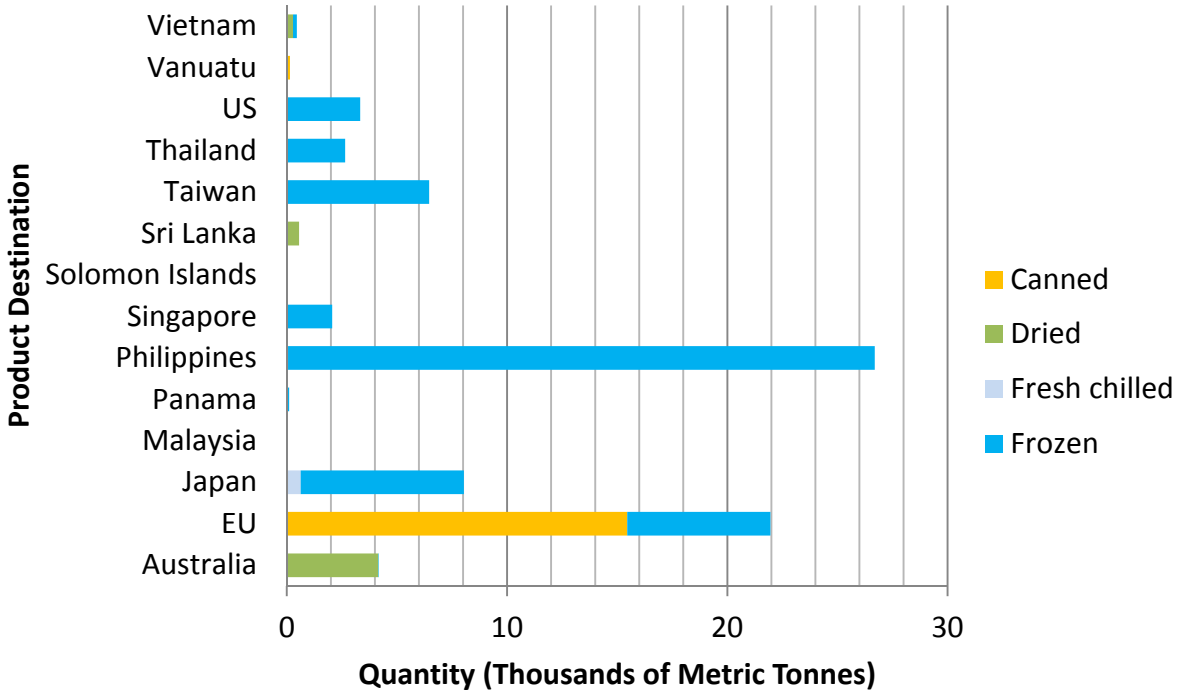

Figure 11: Amount of exported products (mt) to countries of destination in 2011. Source: NFA Database.

A huge majority (98%) of canned products was exported to markets in the countries of the European Union in 2011. The remaining 2% went to Solomon Islands and Vanuatu. Most of the frozen exports (44%), mainly SKJ and YFT, supported canneries in the Philippines, Thailand, Taiwan, Singapore, and the US. Frozen products together with fresh chilled products to Japan were mainly to satisfy the sashimi market demand. Dried products in 2011 were mostly imported by Australian markets with small portion by Sri Lanka and Vietnam (Figure 16).

6. Onshore Developments

Currently there are two major canning facilities in Madang (RD Tuna Canners) and Lae (Frabelle PNG Ltd) respectively, and one loining plant in Wewak (South Sea Tuna Corporation) with a total production capacity of 440 mt per day and providing employment for more than 6000 Papua New Guineans (Table 7a). These facilities are supported by their own cold storages with RD having a private wharf for unloading while Frabelle is at the stage of constructing own wharf as well.

There is also a mackerel canning facility (IFC) which is now venturing into tuna canning, an investment valued around USD 10 million; once the facility is fully completed, it should be capable of producing at a capacity of 150 mt per day and adding over 1000 more employment opportunities for nationals. Three other investment projects are currently in progress - a joint venture between Thai Union, Century Canning and Frabelle; another by a joint venture between RD and Fairwell; and proposed Chinese investments adding to onshore development. With a cumulative estimated investment value of USD 192.5 million, and once completed, these facilities would be producing at a capacity of 1,115 mt per day and providing more than 16,000 employment opportunities for nationals (Table 7b). These investments are in line with the country's development aspirations and aiming at processing all catches in PNG waters back on PNG shores.

Table 7a: Existing onshore facilities

Investors	Product type	Production Capacity (mt/day)	Employment (est.)	
			Direct	Indirect
RD Tuna Canners	Canned tuna	200	3,500	500
Frabelle(PNG) Ltd	Canned tuna	140	1,000	500
Frabelle Frescomar	Raw tuna	40	200	100
South Seas Tuna Corporation	Cooked loins,canned tuna	100	1,000	200
International Food Corporation	Canned mackerel	100	1,000	500
Total		580	6,700	1,800

Table7b: Future onshore facilities

Investors	Product Type	Production Capacity (mt/day)	Estimated Investment Value (USD'm)	Local Employment (est.)	
				Direct	Indirect
Thai Union/Century Canning and Frabelle	Canned tuna	350	80	4,500	1,500
RD/Fairwell	Canned tuna	200	27.5	2,000	500
Chinese Investments	Canned tuna/cooked loins	600	85	6500	1500
International Food Corporation	Canned tuna	150	10	1,000	500
Total		**1,300**	**203**	**14,000**	**4,000**

7. Future Prospects of the Fishery

7.1 Longline

Longline fishery has declined over the years and is not likely to expand in the near future unless there some major change in the current policy controlling this particular fishery. The main reason for the decline is the high operational cost.

7.2 Handline

Although very minimal at this stage, this fishery has some potential for expansion in the not to distant future. The processing plants are supporting this sector through the supply of ice and buying of the fish.

7.3 Purse-seine

Effort in terms of fishing days is capped as per the commission measure 2008-01. However in PNG there would be a re-alignment or shift in the vessels fishing as those vessels not associated with any onshore facility are given less priority over those associated with onshore development. This may mean new vessels into PNG waters provided they are associated with onshore development. If this happens than, some vessels currently licensed but not associated with onshore facilities will no longer be licensed to fish within the waters of PNG.

8. Tuna Fishery Data Collection System and Research Activities

8.1 Log sheet data collection and verification

8.1.1 Catch, Effort and Size Data Coverage

Fleets have been very cooperative in submitting catch and effort data as per the catch logsheet. As a result there has been very high coverage of the catch and effort data (Table 8). For size data, PNG runs a port sampling programme through which size data by species are collected in addition to those data collected by observers at sea. However the port sampling covers mostly vessels fishing in PNG waters and unloading or transhipping through PNG ports. For vessels not unloading or transhipping through PNG ports, size data is collected through the observer programme. For coverage explanations see attachment A.

Table 8a: Estimated annual coverage of catch, effort and size data for Papua New Guinea fishing fleets in the WCPFC Convention Area, 2007–2011

Gear	Fleet	Year	Catch/Effort data coverage	% coverage	Size data coverage	% coverage
LONGLINE	PNG - Domestic	2007	HIGH	>80	MEDIUM	5-15
		2008	HIGH	>80	MEDIUM	5-15
		2009	HIGH	>80	MEDIUM	5-15
		2010	HIGH	>80	MEDIUM	5-16
		2011	HIGH	>80	MEDIUM	5-17
PURSE SEINE	PNG - Domestic	2007	HIGH	>80	MEDIUM	5-15
		2008	HIGH	>80	HIGH	>15
		2009	HIGH	>80	HIGH	>15
		2010	HIGH	>80	HIGH	>15
		2011	HIGH	>80	HIGH	>15
	PNG - Locally Based Foreign	2007	HIGH	>80	MEDIUM	>15
		2008	HIGH	>80	HIGH	>15
		2009	HIGH	>80	HIGH	>15
		2010	HIGH	>80	HIGH	>15
		2011	HIGH	>80	HIGH	>15

Table 8b: Estimated coverage of catch, effort and size data for bilateral-arrangement, foreign fleets fishing in Papua New Guinea's EEZ.

Gear	Fleet	Year	Catch/Effort data coverage	% coverage	Size data coverage	% coverage
PURSE-SEINE	CHINA	2007	HIGH	>80	MEDIUM	5-15
		2008	HIGH	>80	MEDIUM	5-15
		2009	HIGH	>80	HIGH	>15
		2010	HIGH	>80	HIGH	>15
		2011	HIGH	>80	HIGH	>15
	KOREA	2007	HIGH	>80	MEDIUM	5-15
		2008	HIGH	>80	MEDIUM	5-15
		2009	HIGH	>80	HIGH	>15
		2010	HIGH	>80	HIGH	>15
		2011	HIGH	>80	MEDIUM	5-15
	CHINESE TAIPEI	2007	HIGH	>80	MEDIUM	5-15
		2008	HIGH	>80	MEDIUM	5-15
		2009	HIGH	>80	HIGH	>15
		2010	HIGH	>80	HIGH	>15
		2011	HIGH	>80	HIGH	>15
	VANUATU	2007	HIGH	>80	MEDIUM	5-15
		2008	HIGH	>80	MEDIUM	5-15
		2009	HIGH	>80	HIGH	>15
		2010	HIGH	>80	HIGH	>15
		2011	HIGH	>80	HIGH	>15
	JAPAN	2007	HIGH	>80	MEDIUM	5-15
		2008	HIGH	>80	MEDIUM	5-15
		2009	HIGH	>80	HIGH	>15
		2010	HIGH	>80	HIGH	>15
		2011	HIGH	>80	HIGH	>15

8.1.2 Electronic Data Reporting

PNG is currently in the process of completing its electronic data reporting system. This system is a web-based application that allows vessels to send their logsheets and other catch information electronically. As soon as the data are received, the database is updated automatically. This system will help data reporting to be on time and enables us to work with real time data for management and scientific purposes.

8.2 Observer program

The number of observers in PNG was over 250 in 2011. The program aims to train up to 400 observers by the next 3-4 years. The observer training is now a component of the training run by the PNG National Fisheries College. The training courses run four times a year for two months each session. On average (2007 - 2011), observer coverage level for PNG flag vessels was about 91%, PNG charter vessels about 62% and foreign vessels just under 50% (Table 9). Observers also cover trips on tuna longline vessels and FAD deployment trips (not included in table). Observer coverage on PNG Flag vessels was generally high above 80% in the past 4 years and in 2011 the estimated coverage was 97.5%. The level of observer coverage on PNG chartered vessels was medium at over 50% except in 2009 where it dropped to 49.9% and then increased to 66.7% in 2011. Low observer coverage (below 50%) was seen on foreign purse seine vessels until 2010 where the coverage increased to 65% due the observer program having more observer trainers which amplified the number of trainings. In 2011, the observer coverage on foreign vessels improved to 80%.

Table 9: Observer coverage by PNG observers on fleets fishing in waters under PNG national jurisdiction (source: NFA data base)

	PNG FLAG VESSELS			PNG CHARTERED VESSELS			FOREIGN FLAG VESSELS		
Year	**Est. vsl. days at sea**	**Observer Days**	**% Coverage**	**Est. vsl. days at sea**	**Observer Days**	**% Coverage**	**Est. vsl. days at sea**	**Observer Days**	**% Coverage**
2007	1,363	1,125	82.5	4,287	2,520	58.8	14,252	2,769	19.4
2008	1,712	1,615	94.3	4,484	3,253	72.5	12,487	3,952	31.6
2009	2,157	1,816	84.2	4,717	2,356	49.9	11,052	4,017	36.3
2010	1,167	1,151	98.6	3,878	2,386	61.5	15,796	10,308	65.3
2011	1,202	1,172	97.5	5,476	3,652	66.7	14,648	11,714	80.0
AVG	**1,520**	**1,379**	**91**	**4,568**	**2,833**	**62**	**13,647**	**6,552**	**47**

8.3 Port Sampling Program

PNG port sampling program on purse seine catches is still being conducted in the main unloading and transhipment ports around the county. With the aim of covering an estimated 20-25% of the catch weight unloaded or transhipped, a well is stratified into layers and a number of nets are being sampled based on the gross weight of the catch in the well. Fork lengths of all fish in the net are measured and fish indentified to species level by trained port samplers. Various reports of the program were presented in SC 6 session in 2010 for the previous year's results. During 2011 150 vessels that either landed or transhipped their catch in PNG ports were sampled and information papers will be presented in the 8th Scientific Committee Meeting, 2012. Funding of this project was also supported by the Japanese Trust Fund (JTF) programme.

8.4 Tuna Tagging Project

A PNG Tuna Tagging Project is currently being conducted in the PNG waters in collaboration with the Secretariat of the Pacific Community (SPC) under the umbrella of SPC's Pacific Tuna Tagging Program (PTTP). This initiative is aimed to improve monitoring of tuna stocks and their exploitation, and obtaining additional data over a longer time frame to be used in regular tuna stock assessments in which specific estimates for PNG EEZ can be obtained.

The project is planned for three years from 2011 to 2013 in which 3 months of tag release cruises in PNG waters will be conducted per year. Other key areas of the project includes the implementation of tag recovery procedures in major PNG and other unloading sites; data quality checking and integration of the data into the SPC tagging database; analysis of the data to generate scientific advice for the management of tuna fisheries in PNG; and capacity building within the NFA in the above areas.

9. References

Kumoru, L.2010. Annual Report to the Commission, Part 1: Information of Fisheries, Research and Statistics, WCPFC-SC6-AR/CCM18.

10. Attachments

Attachment A.

Coverage of catch, effort and size data can now be categorized into three categories. They can either be high, medium or low. Where there is no data, it would be stated as "no data". For the catch/effort data coverage "high" represents coverage of greater than 80%, "medium" between 50-80% while "low"0-50%. For the size data coverage "high" is represented greater than15%, "medium" 5-15% and "low" 0-15% (see Table 10).

The percentage representation of the latter data coverage is so because the actual size data collection is not extensive (i.e. a sample representation is required only) and in many cases can only be partially carried out.

Table 10. Categories of coverage for catch, effort and size data.

Category	Catch/Effort data coverage	Size data coverage
HIGH	> 80%	> 15%
MEDIUM	50-80%	5-15%
LOW	0-50%	0-5%
–	No data	No data

LEGEND:

- "**Catch/Effort data coverage**" is determined by comparing the annual catch from operational (logsheet) data to the **total** annual catch, as determined by unloadings or other types of data/information.
- "**Size data coverage**" is determined by comparing the number of trips covered by port sampling and observers (collecting size data) with the estimated number of **actual** trips undertaken by this fleet during that year.