


FISHERY AND AQUACULTURE COUNTRY PROFILE	Food and Agriculture Organization of the United Nations	FID/CP/PLW
PROFILS DES PÊCHES ET DE L'AQUACULTURE PAR PAYS	Organisation des Nations Unies pour l'alimentation et l'agriculture	
PERFILES SOBRE LA PESCA Y LA ACUICULTURA POR PAÍSES	Organización de las Naciones Unidas para la Agricultura y la Alimentación	October 2009

NATIONAL FISHERY SECTOR OVERVIEW

PALAU

1. GENERAL GEOGRAPHIC AND ECONOMIC DATA

Area:	488 km ²
Water area:	629 000 km ²
Shelf area:	[no continental shelf]
Length of continental coastline:	430 km (length of 200 m isobath)
Population (2007):	20 000
GDP at purchaser's value (2006)	USD 156 614 000 ¹
GDP per head (2006):	USD 7 812
Agricultural GDP (2006):	USD 1 927 000 ²
Fisheries GDP (2006):	USD 3 047 000 ³

2. FISHERIES DATA

2007	Production	Imports	Exports	Total Supply	Per Caput Supply
	tonnes liveweight				kg/year
Fish for direct human consumption ⁴	1 003	461	332	1 354 ⁵	67.7
Fish for animal feed and other purposes	0	---	0	---	

Estimated Employment (2008):	
(i) Primary sector:	460 ⁶
(ii) Secondary sector:	(unavailable)
Gross value of fisheries output (2007):	USD 24.1 million ⁷
Trade (2007):	

¹ Source: unpublished data, Office of Planning and Statistics

² In the official statistics of Palau [Bureau of Budget & Planning (2008). 2006 Statistical Yearbook. Ministry of Finance, Republic of Palau] the "agriculture" component of GDP does not include fishing

³ This is the official fisheries contribution to GDP as per Bureau of Budget & Planning (2008). 2006 Statistical Yearbook. Ministry of Finance, Republic of Palau.. A recalculation shows the total fishing contribution to be USD 9.6 million (Gillett 2009)

⁴ Data from FAO food balance sheet of fish and fishery products.

⁵ Corrected to reflect actual supply.

⁶ In addition, the 2005 census indicates that 305 people reported income from selling fish and 933 people reported some subsistence fishing.

⁷ From Gillett (2009). The Contribution of Fisheries to the Economies of Pacific Island Countries and Territories. Pacific Studies Series, Asian Development Bank, Manila. Includes the six fishery production categories: (1) coastal commercial fishing, (2) coastal subsistence fishing, (3) locally-based offshore fishing, (4) foreign-based offshore fishing, (5) freshwater fishing, and (6) aquaculture.

Value of fisheries imports:	(unavailable)
Value of fisheries exports:	USD 19.1 million

3. FISHERY SECTOR STRUCTURE

3.1 Overall fishery sector

The geography of Palau exerts a large influence on fishing in the country. The 343 islands of the Republic of Palau are diverse in geological origin and include volcanic, low platform, high platform, and atoll types. The Republic includes the islands of Koror (the administrative center and capital), Babelthuap (the largest island in terms of land mass, making up 78% of Palau's land area), Angaur, Peleliu and several coral outer islands including Sonsorol, Tobi, Pulu Anna, Helen's Reef and Merir to the southwest, and Kayangel to the north. More than 70% of the population resides in Koror.

Marine life in Palau is abundant and diverse with over 1 300 species of tropical fish and over 700 different species of hard and soft corals in the lagoons and reefs. Most coastal habitats and topographical features found anywhere in the Pacific Island can be found within Palau. The most distinguishing features of the coastal area of Palau as compared to most other Pacific Island countries are the large amount of mangroves and coastal tourism.

Much of the coastal fishing activity is geared to producing for domestic urban markets, while the offshore fishing consists largely of tuna longlining for the export market.

The major marine habitats of Palau and their approximate sizes are:

- Mangroves – 45 sq km
- Inner reef – 187 sq km
- Outer reef – 265 sq km
- Lagoon – 1 034 sq km

With respect to the current fishery production, Palau's fisheries can be placed into six categories. Estimates for production per category in 2007 are as follows:

	Coastal Commercial	Coastal Subsistence	Offshore Locally- Based	Offshore Foreign- Based ⁸	Freshwater	Aquaculture	
						Tonnes	Pieces ⁹
Volume of Production (Tonnes or pieces)	865	1 250	3 030	1 464	1	2	3 100
Value of production (USD)	2 843 000	2 511 000	13 779 656	4 947 496	8 000	50 000	

Source: Gillett (2009)

The above estimates include landings by foreign flagged vessels operating within the EEZ of Palau.

The main trends and important issues in the fisheries sector

The main trends in the sector include:

- Increasing exploitation of the coastal resources, especially those close to urban markets.
- Continuing substantial involvement of local and international NGOs in the management of coastal marine resources

⁸ This is the catch in the Palau zone by vessels based outside the country.

⁹ Pearls and giant clams are commonly measured in pieces, rather than kg.

- Growing realization of the inability of Palau’s coastal resources to feed local residents and tourists, and support commercial exports.
- Increasing interaction between fishing activities and Palau’s thriving tourist trade

Some of the major issues in the fisheries sector are:

- A large investment in aquaculture development activities over the last 37 years has yielded disappointing results.
- The opportunity to link fisheries with a large and expanding tourism industry.
- The regional/global move to ecosystem-approach to fisheries management, however desirable, is clashing with the practical realities of undertaking fisheries management in Palau.
- It is sometimes difficult to balance the benefits and costs of locally-based foreign fishing activity, especially in an environment where tourism is important.
- The regular monitoring of the landings from coastal fishing is not simple or cheap.

3.2 Marine sub-sector

The marine fisheries have two very distinct components, offshore and coastal:

- Offshore fisheries are undertaken on an industrial scale by locally-based foreign longline vessels and sporadically by one domestic pole-and-line vessel.
- Coastal fishing is primarily carried out for subsistence purposes and for sales for local markets. In addition, there are some coastal fisheries that are export oriented: trochus and aquarium fish.

3.2.1 Marine Catch profile

Estimates of the volumes and values of the catches of the main commercial species of tuna in Palau have been made by the Forum Fisheries Agency¹⁰, using data sourced from the Oceanic Fisheries Program of the Secretariat of the Pacific Community (see table below). Total tuna catches from Palau water have been estimated by adding in volumes and values of bycatch. No catch of tuna or tuna-like species have been reported for 2007 by vessels flying the Palau flag.

Catch Volumes and Values for the Palau-Based Offshore Fleet

	2003	2004	2005	2006	2007
Volume total catch (tonnes)	1 889	2 016	4 107	5 935	3 030
Dockside value total catch (USD)	7 933 600	8 885 365	19 381 857	27 683 684	13 779 656

Estimates of catches from the coastal fisheries vary widely. In 2008 the Asian Development Bank examined a large number of studies on coastal fishing in Palau, and made catch estimates by selectively using certain reports, especially a survey by the Palau Conservation Society¹¹. Accordingly, it was determined that crude estimates of the recent annual production from Palau’s coastal fisheries would be:

- Coastal commercial fisheries: 865 tonnes; At a price to the fisher of USD 2.87 per kg, this is worth USD 2 843 000.
- Subsistence fisheries: 1 250 tonnes; Using the “farm gate” system of valuing subsistence production, (discounting prices for commercial fish by 30%), this would be worth USD 2 511 000 to the producer.

¹⁰ FFA (2008). The Value of WCPFC Tuna Fisheries. Unpublished report, Forum Fisheries Agency, Honiara.

¹¹ PCS (2000). Profiles of Palau’s Inshore Fisheries, 1989-1998. Palau Conservation Society.

3.2.2 Marine landing sites

The locally-based offshore fishing vessels generally offload their catch at the industrial port that services the Koror urban area. There are reports that some longliners occasionally deliver their catch to Davao in the Philippines.

The catch from small-scale commercial fishing is offloaded, mainly at Koror. Some is landed at other locations (i.e. on several locations on Babelthuap) where it is delivered by truck to markets, mainly in Koror.

Subsistence fishery landings occur at coastal villages and hamlets throughout the country, roughly in proportion to the distribution of the population.

3.2.3. Marine fishing production means

Almost all offshore tuna catches in the Palau zone are currently made by locally-based foreign longliners. These vessels range in size from about 16 to 27 metres in length. Most vessels are registered in Taiwan, Province of China, with smaller numbers registered in Belize, Indonesia, and Vietnam. In 2007 about 100 such vessels were based in Koror and licensed to fish in the Palau zone. Some tuna is occasionally caught around Palau by purse seining (405 tonnes in 2007), but the zone is located to the west of where most tuna purse seining in the Pacific Islands region occurs.

Coastal fishing in Palau is carried out by using various types of vessels and gears – on a commercial and subsistence basis. Techniques used include simple hand-collection to hook-and-line fishing, underwater spear-fishing, net fishing and trolling, most of which are conducted almost exclusively by men.

Boat-based coastal fishing activities involve the use of small fishing craft, typically from 4.8 to 7.6 m in length and powered by outboard motors. At least 25% of households in Palau own fishing boats and through the extended family system, most fishers have access to a powered craft of this type. The completion of the road around the island of Babelthuap several years ago caused considerable change in the marketing of catch and made boat-owners shift landing places for their craft.

Another aspect of coastal fishing in Palau are the occasional commercial fishing trips from the urban center of Koror to the southwest islands – an activity that periodically produces spikes in national coastal fish production.

3.2.4 Main resources

The main targets of longlining in the Palau zone are three species of tuna. In recent years about half of the longline tuna catch was bigeye, with yellowfin about a third, and the remainder albacore.

The Palau Conservation Society (PCS 2000)¹² gives the important species in Palau’s coastal fisheries:

Important Species in Palau’s Coastal Fisheries		
Category	Species	
Local pelagic fish	Carangidae: <i>Selar crumenophthalmus</i> (bigeye scad/ <i>terekrik</i>) <i>Elagatis bipinnulatus</i> (rainbow runner/ <i>desui</i>)	
	Sphyraenidae: (barracudas/ <i>ai/mordubech/lolou</i>)	
	Scombridae: <i>Rastrelliger kanagurta</i> (striped mackerel/ <i>smach</i>) <i>Scomberomorus commerson</i> (spanish mackerel/ <i>ngelngal</i>) <i>Euthynnus affinis</i> (kawakawa/ <i>soda</i>) <i>Acanthocybium solandri</i> (wahoo/ <i>keskas</i>)	
	Mangrove crab	<i>Scylla serrata</i> (mangrove crab/ <i>chemang</i>)
	Lobster	<i>Panulirus longipes</i> (<i>melech</i>) <i>P. penicillatus</i> (<i>raiklius</i>) <i>P. versicolor</i> (<i>bleyached</i>)
Trochus	<i>Trochus niloticus</i> (<i>semum</i>)	
	all Tridacnidae, including:	

¹² PCS (2000). Profiles of Palau’s Inshore Fisheries, 1989-1998. Palau Conservation Socie

Category	Species
Giant clam	<i>Tridacna crocea</i> (oruer) <i>T. derasa</i> (kism) <i>T. gigas</i> (oktang) <i>T. maxima</i> (melibes) <i>T. squamosa</i> (ribkungel) <i>Hippopus hippopus</i> (duadeb) <i>H. porcellanus</i> (duadeb)
Sea cucumber	all Holothuriidae, including: <i>Actinopyga mauritiana</i> (badelchelicid) <i>A. miliaris</i> (cheremrum) <i>Holothuria fuscogilva</i> (bakelungal cherou) <i>H. nobilis</i> (bakelungal) <i>H. scabra</i> (molech) <i>Stichopus variegatus</i> (ngims) <i>Thelenota ananas</i> (temetamel)
Other invertebrates	<i>Birgus latro</i> (coconut crab/ketat) <i>Cardisoma</i> spp. (land crabs/rekung el beab) <i>Anodonia philippina</i> (mangrove clam/ngduul) <i>Gafrarium</i> spp. (nut clam/delebekai) <i>Octopus</i> spp. (octopus/bukitang) <i>Tripneustes gratilla</i> (sea urchin/ibuchel) <i>Loligos</i> spp. (squid/luut) <i>Sepia</i> spp. (cuttlefish/milengoll) <i>Nautilus</i> spp. (nautilus/kedarm)

3.2.5 Management applied to main marine fisheries

The management of the offshore fishery is undertaken through the framework of a management plan. The management of other coastal fisheries is less formalized.

The "Palau National Tuna Fisheries Management 2001" is a 39-page document. The first 18 pages are dedicated to descriptions of the fisheries, resources, and legal regime. The substantive elements consist of the aims of the plan, the scope of the plan, and seven main objectives. The plan has proven useful in balancing tradeoffs, especially between fishery and tourism objectives.

The management applied to coastal fisheries is shaped by the Palau constitution, various laws covering fisheries activities, the staff of the Ministry of Natural Resources, Environment & Tourism, NGOs, and communities. The constitution gives the power to manage coastal fisheries in the zone up to 12 nautical miles offshore to the 16 states that make up the country. A salient issue having considerable impact on the fisheries management strategy in Palau is the balancing of nutritional, tourism, and export benefits of coastal resources (Box). There is a growing sentiment in Palau that, given the realities of coastal fisheries management in Palau, the most appropriate course of action would be to simply ban the export of coastal food fish. Non-government organizations, especially the Palau Conservation Society, exert considerable influence in coastal fisheries management.

Box: Fish for Nutrition, Tourism, and Exports

"The following strategy has been recommended as a basis for in-shore fisheries management: 'first we eat them; second we play with them; third we let visitors eat and play with them, and fourth, we export them.' In other words, give first priority to fish consumption by Palauans resident in Palau; second priority to sports fisheries and recreation by Palauans; third priority to meeting the food and recreational needs of tourists; and finally fourth (only if the resource reserves permit) do we export them."

Source: Dr. Paul Callaghan, Palau, 1994; cited in Chapman (2004)¹³

Management objectives

The Palau National Tuna Fisheries Management Plan specifies the objectives for the management of the country's offshore fisheries:

- Conserving fishery resources by controlling harvesting within international and regional recognized sustainable limits.
- Establishing an efficient government framework to harmonize application of fisheries management policies and practices.

¹³ Chapman, L. (2004). Nearshore Domestic Fisheries Development in Pacific Island Countries and Territories. Secretariat of the Pacific Community, Noumea.

- Minimizing detrimental impacts of fishing on coastal and inshore environment.
- Attaining an optimum balance in relation to access to the resource between all stakeholders.
- Enhancing the overall economic balance between: the necessity for government to generate revenue, financial expectations of the commercial tuna fishery interests, and the interests of other users of the resource.
- Promoting Palauans in professional, administrative, research and development positions in the fishery and related industries and government agencies.
- Adhering to Palau's regional and international marine agreements.

The management objectives of coastal fisheries are less formalized. In general, the objectives of much management are to assure the sustainability of fishery resources for domestic food, for recreation for Palauans, and for viewing by tourists.

Management measures and institutional arrangements

The main management measure for the offshore fisheries (as stipulated in the Palau National Tuna Fisheries Management Plan) is a requirement for a fishing licence and conditions associated with that licence (i.e. payment of fees, pollution controls). These measures are supplemented by a number of regional measures coordinated by the Forum Fisheries Agency, including:

- Regionally harmonized minimum terms and conditions for foreign fishing vessel access (Box)
- A limit on the number of tuna purse seine vessels allowed to fish in the region in the Palau Arrangement for the Management of the Western Pacific Purse Seine Fishery

Box: Minimum Terms and Conditions for Foreign Fishing Vessel Access

Pacific Island countries (PICs), including Palau, developed a set of Harmonized Minimum Terms and Conditions for Foreign Fishing Vessel Access (MTCs) that apply to all foreign fishing vessels seeking access to EEZs of the Pacific Island Countries. Currently, the application of these MTCs is both widespread and comprehensive by PICs in areas under their respective national jurisdictions. The MTCs provide the following guidance to PICs in licensing foreign fishing vessels:

- **Use of a common regional licence form;**
- **Vessels are required to be in "good standing" on the Regional Register of Foreign Fishing Vessels and Vessel Monitoring System (VMS) Register of Foreign Fishing Vessels as a condition of licensing;**
- **Monitoring and control of transshipment;**
- **Maintenance and submission of prescribed forms reporting all catch and by-catch taken in EEZs and on the high seas;**
- **Vessel reporting requirements;**
- **Observers and observer coverage;**
- **Appointment of an agent in the relevant PIC licensing country;**
- **Requirements for foreign fishing vessels to stow gear when transiting fisheries zones;**
- **Application of MTC in port and exercise of port State authority;**
- **Enforcement cooperation;**
- **Flag State or Fishermen's Associations Responsibility;**
- **Requirement to implement regional Vessel Monitoring System;**
- **Identification of fish aggregating devices;**
- **Pre-fishing inspections.**

In the management of coastal fisheries, a number of management measures at the national level are used. Many are specified in the legislation. These include mesh sizes, bans on types of fishing gear, minimum size limits, catch bans, export bans, and closed seasons. Palau has been a pioneer in the region in the use of marine protected areas for fishery and other purposes.

There are also management measures implemented at the local level. As examples, a World Bank study¹⁴ identified management measures at six sites in Palau:

Perceived Threats and Local Management Measures

Village	Threats Identified by the Community	Local management measures
Ngiwal	Road construction, the disturbance caused by outboard motors, commercial pressure leading to over-harvesting, and siltation	<ul style="list-style-type: none"> • Prohibition on entry or harvesting in the conservation area. • Ban on dynamiting. • Ban on cutting mangrove for use out of state. • Requirement that outsiders ask permission to fish in the site.
Kayangel	Speedboat disturbances, oil spills, and pollution/ rubbish in the lagoon	<ul style="list-style-type: none"> • No entry/ harvesting in the conservation area. • Ban on commercial fishing in Kayangel Atoll lagoon. • Restrictions on taking giant clam placed in front of the village. • Restrictions on taking turtle in excess of domestic needs. • Ban on the use of gillnets.
Peleliu	Over-fishing, outboard motors, speedboats, exhaust oils, destructive fishing methods, disturbances caused by fishing activities, and mangrove clearing for fish ponds	<ul style="list-style-type: none"> • Prohibition of net fishing in certain areas within the reef. • Tourist catch-and-release law.
Koror	Sewage, dredging, erosion, oil spills, tourism, and the chemicals used to clean boats	<ul style="list-style-type: none"> • Requirement to register boats and motors. • Dive permit requirement. • Fishing licence fees. • Ban on cutting trees in Rock Islands. • Special requirement for permission for access to Ngemelis/ Ngerchong.
Melekeok	Overfishing, sediment run-off from dirt roads, beach erosion, siltation on reefs and sea grass beds, trash from village dump, past dredging, and disturbance caused by outboard motors	<ul style="list-style-type: none"> • Banning of net fishing in the rocky/ coral lagoon floor next to the reef. • Prohibition of cutting mangrove trees for sale out of the state. • Law designating a portion of the reef for clam conservation
Ngeremle ngui	Speedboats, erosion, extraction of coral for lime production, over-fishing and destructive fishing	<ul style="list-style-type: none"> • Mangrove crabs seasonal harvest restrictions • Marine conservation area • Prohibition of exporting mangrove trees out of the site

Institutions

The national-level management measures are implemented through the Bureau of Marine Resource of the Ministry of Natural Resources, Environment and Tourism. Lower level management measures are implemented by the 16 state governments which, under the constitution, control all resources from the shoreline up to 12 nautical miles offshore (except for the tuna resources).

¹⁴ World Bank (2000). Voices from the Village. Number 9, Pacific Island Discussion Paper Series, World Bank, Washington DC, 175 pages.

The Palau Conservation Society is an important institution affecting the management of marine fisheries. Founded by a former fisheries officer, the Society has been active in advocating fisheries management, conducting studies in support of fisheries management, and promoting alternatives to extractive uses of the marine environment.

3.2.6 Fishermen Communities

The concept of "fishermen communities" has limited applicability to Palau. Nearly all households in the country are involved in coastal fishing activities. It could therefore be stated that all villages in Palau are "fishing communities".

3.3 Inland sub-sector

There are no major freshwater fisheries, but the larger islands of Palau (especially Babeldaob) have freshwater bodies that support small amounts of edible freshwater fish and invertebrates. Eels and shrimp are likely to be the most abundant of the edible freshwater animals. The capture of eels is not large due to cultural attitudes. Small amount of freshwater shrimp are taken and consumed.

3.4 Recreational sub-sector

In Palau there is recreational fishing for both Palau residents and for tourists. Residents participate in fishing as a casual leisure activity. In addition, there is an active gamefishing association. One major fishing derby and a few small fishing derbies are held each year in Palau.

There are about 10 vessels which occasionally participate in commercial sports fishing for tourists, but only a few vessels are employed primarily in this business. Most commercial sports fishing for tourists involves pelagic trolling outside the reef, but there has been promotion of inshore catch-and-release sports fishing by the Palau Conservation Society.

There is no active management of the recreational sub-sector, except for the general applicability of the national/state legislation (e.g. some spatial bans on fishing activity).

3.5 Aquaculture sub-sector

The Micronesian Mariculture Demonstration Center was established in 1973 to serve Palau and other US-affiliated Pacific islands by developing, demonstrating and promoting mariculture technology. Later renamed the Palau Mariculture Demonstration Center the facility also serves as a sub-regional mariculture training centre and a marine science research laboratory.

During four decades the culture in Palau of a large number of organisms has been attempted, both at the Center and in independent efforts. Despite these activities significant aquaculture production in Palau is presently confined to giant clams and milkfish. In 2007, hatcheries in Palau produced about 0.4 million giant clam juveniles and 0.2 million milkfish fingerlings. About 4.1 tonnes of milkfish were produced through aquaculture. This aquaculture production is mostly dependent on government subsidies.

The main aquaculture management measure is the requirement for an aquaculture permit for all facilities.

4. POST-HARVEST USE

4.1 Fish utilization

In general offshore fishing is export oriented. The high quality fresh bigeye and yellowfin is typically exported for sashimi, with the albacore destined to canneries and the bycatch for domestic and export use.

With respect to the disposal of the catch from coastal fisheries, because subsistence fishing remains a major activity (about 60% of the coastal catch by volume), much is utilized by the household that makes the catch. The remainder of the coastal catch is used for local retail markets, the hotel/restaurant trade in Palau, and for export. The latter category is largely exported as baggage by travelers to family and friends in Guam and Honolulu.

The distribution channel for trochus is quite different, with the meat being utilized locally and the shell for the manufacture of mother-of-pearl buttons. Most of the giant clam exports are for the ornamental aquarium trade.

4.2 Fish Markets

In Palau all fresh chilled sashimi-grade tuna, once offloaded and packed, are air-freighted within 24 hours to sashimi markets in Japan (95%), U.S mainland, and Taiwan Province of China. The albacore for canning goes mostly to Asian canneries (mainly in Thailand) but occasionally is canned in American Samoa.

Although subsistence fishing remains a major activity, the economic growth of Koror, tourism development, the increasing availability of non-fisheries related employment and a large foreign labour force have together resulted in the establishment of a cash market for fresh fish and other seafoods. These markets are located in mainly the Koror urban area, but some small markets exist in the main residential areas of the states.

The trochus button manufacturing occurs in Asia and Europe, with the specific destination dependent on price. Marine ornamentals (aquarium fish, juvenile giant clams) are for markets in the USA.

5. FISHERY SECTOR PERFORMANCE

5.1 Economic role of fisheries in the national economy

A recent study by the Asian Development Bank¹⁵ attempted to quantify the fishery-related benefits received by Palau. The study gave the available information on the contribution of fishing/fisheries to GDP, exports, government revenue, and employment. The results can be summarized as:

- Official estimates show that fishing in 2006 was responsible for 2.2 % of the GDP of Palau. A recalculation using a different methodology shows it was 6.1 % in 2006.
- Exports of fishery products are about 100 % of all export in 2007.
- Access fees paid by foreign fishing vessels represent 3.2 % of all government revenue.
- The 2005 census indicates that, of the 13 800 people reporting income in 2004, 305 people (2.2%) reported income from selling fish; of 14 154 people over 18 years old in 2004, 933 people (6.6%) reported some subsistence fishing activity

From the above it can be seen that fisheries make a relatively important contribution to GDP and exports.

5.2 Demand

The per capita consumption of fish in Palau, based on the 2007 FAO food balance sheet, is 67.7 kg. Various other studies have made estimates ranging between 33.4 and 135.0 kg. The determination of fish consumption in Palau is complicated by a large tourist population.

Considering Palau's expected population growth and an hypothetical average annual consumption of 65 kg of fish per capita, the demand for fish in 2010 would amount to about 1 365 tonnes of fish.

Major factors influencing the future demand for fish are emigration, increases in the price of fish, the state of the tourism industry, and the general prosperity of Palau. The latter is greatly affected by payments by the USA under the arrangements in which Palau obtained its political independence.

¹⁵ Gillett, R. (2009). The Contribution of Fisheries to the Economies of Pacific Island Countries and Territories. Pacific Studies Series, Asian Development Bank, World Bank, Forum Fisheries Agency, Secretariat of the Pacific Community, and Australian Agency for International Development, 362 pages.

5.3 Supply

The government has several strategies to increase the national fish supply. These involve supporting the development of aquaculture, and facilitating the capture of under-exploited tuna and bottomfish, and provision of ice at fisheries centers to facilitate marketing. The government is now contemplating a ban on the export of inshore food fish, with one objective being to prevent a decrease in fish supply for domestic consumption.

Major factors affecting the local supply of fish are over-fishing, transport links from the non-urban parts of the country, and the offloading of fish by the offshore fleet.

5.4 Trade

The International Monetary Fund (IMF 2006)¹⁶ states that 100% of all exports of Palau in recent years were fish. Tuna make up most of the exports of fishery products from Palau. Other items include ornamental fish, giant clams, and trochus.

5.5 Food security

Fish is an important element of food security in Palau. Although Palau has a high GDP per capita relative to other countries in the region (USD 7 812), implying considerable ability to purchase food, much of the national prosperity is based on payments from the USA – income that will not continue in perpetuity. This fact, in conjunction with a high per capita consumption of fish, attests to the large importance of fish in national food security.

5.6 Employment

The 2005 census contains some information on employment in fisheries:

- Of the 13,800 people reporting income in 2004, 305 people (2.2%) reported income from selling fish
- Of 14,154 people over 18 years old in 2004, 933 people (6.6%) reported some subsistence fishing activity
- Of the 933 subsistence fishers, 186 (19.9%) were female.

For coastal commercial fishing, PCS (2000)¹⁷ reports that there were 200 commercial and 1 100 non-commercial fishers in Palau in the late 1990s. With a gradual movement of people out of fishing employment and into jobs related to tourism, the number of commercial fishers has decreased over the last decade to an estimated 460 fishers in 2008.

Considering the size of the locally-based tuna industry (over 100 vessels, plus processing/shipment facilities) the tuna-related employment is quite small. Gillett (2008)¹⁸ tracked the number of people employed in the tuna fisheries of Palau (fishing and post-harvest) over a seven-year period:

Employment in the Tuna Fisheries of Palau

	2002	2006	2008
Local Jobs on Vessels	1	0	0
Local Jobs in Shore Facilities	11	5	20
Total	12	5	20

5.7 Rural development

The Bureau of Marine Resource of the Ministry of Natural Resources, Environment and Tourism has several activities that are relevant to rural development, including placement of two or three fish aggregation devices (FADs) per year, conducting training in fishing around FADs, promotion of ice plants in rural areas, and promotion of clam farming.

¹⁶ IMF (2006). Public Information Notice on the Executive Board Discussion and Statement by the Executive Director for the Republic Palau. International Monetary Fund, Washington.

¹⁷ PCS (2000). Profiles of Palau's Inshore Fisheries, 1989-1998. Palau Conservation Society.

¹⁸ Gillett, R. (2008). A Study of Tuna Industry Development Aspirations of FFA Member Countries. Forum Fisheries Agency, Honiara, 70 pages.

The Palau Conservation Society (PCS) carried out the Inshore Sport fishing Development Project, in cooperation with the U.S. government, The Nature Conservancy, and the Palau government. The aim of the project was to conserve and make the best use of the diversity and abundance of Palau's reef fishes by developing a community-based sportfishing industry, primarily in the non-urban areas of Palau.

6. FISHERY SECTOR DEVELOPMENT

6.1 Constraints and opportunities

Some of the major constraints of the fisheries sector are:

- Expansion of the fisheries sector (for both coastal and offshore fisheries) is often constrained by real and imagined interaction with the tourism sector.
- Although there is considerable employment in the tuna industry, few Palauans are willing to accept those types of jobs.
- Given the proximity of the country to Asia, the demand for coastal fishery products by affluent overseas consumers could easily deplete resources to the detriment of domestic fish consumption and tourism.
- Considering the substantial support given to aquaculture over the last four decades, the lack of economic activities in this field is disappointing.

The opportunities in the fisheries sector include:

- Enhancement of the input of the private sector into the functioning of the Bureau of Marine Resource.
- Enhancing linkages between the fisheries and tourism sectors, including sports fishing and provision of value added fishery products to the tourism industry
- Improving access by small-scale fishers to the tuna resources
- Improving fish handling/processing in coastal fisheries

6.2 Government and private sector policies and development strategies

Provisions in the Constitution of Palau suggest that some of the over-arching elements of the fishery policy in Palau are:¹⁹

- Subject to national regulation, the states own the living and non-living marine resources from land up to twelve nautical miles seaward from the baselines;
- The national government owns and manages the resources outside of twelve nautical miles;
- The national and state governments are responsible for managing all living and non-living marine resources for the general welfare and security of the citizens of Palau;
- Traditional fishing rights and practices are not to be impaired; and,
- The conservation of the natural environment shall be undertaken for the economic benefit, health and social welfare of the citizens of Palau.

In late 2009 the Secretariat of the Pacific Community began preparation to assist Palau in the development of a national fisheries policy. Presently, the government's policies and development strategies in the offshore fisheries appear to be best reflected in the objectives of the current tuna management and development plan:

- Conserve fishery resources by controlling harvesting within international and regional recognized sustainable limits.
- Establish an efficient government framework to harmonize application of fisheries management policies and practices.
- Minimize detrimental impacts of fishing on coastal and inshore environment.
- Attain an optimum balance in relation to access to the resource between all stakeholders.
- Enhance the overall economic balance between: the necessity for government to generate revenue, financial expectations of the commercial tuna fishery interests, and the interests of other users of the resource.
- Promote Palauans in professional, administrative, research and development positions in the fishery and related industries and government agencies.

¹⁹ Kuemlangan, B. (2004). Report on Assistance to Palau in Drafting Fisheries Legislation. Technical Cooperation Programme, Food and Agriculture Organization of the United Nations, Rome.

- Adherence to Palau's regional and international marine agreements.

The coastal fisheries policies can be inferred from recent activities of the Bureau of Marine Resource. These include:

- Emphasizing the realignment, restructuring and strengthening of national fisheries laws, policies, institutions and programs.
- Improving the quality of coastal fishery products through improved handling/marketing
- Diverting fishing effort from coastal areas to the less exploited offshore tuna and bottomfish resources.
- Giving attention to improved management of the trochus fishery

The private sector's policies are not formalized. Judging from the attitudes and recent action of the companies engaged in offshore fishing, the main policy is not one of expanding but rather surviving during a period of poor profitability – as has been the case for the last few years.

6.3 Research

A very large number of fisheries research projects have been carried out in Palau. Most areas of Palau and most types of fisheries resources have been covered by various research endeavors. The older research is listed in the Palau Marine Resources Bibliography²⁰. The results of many of the research projects are summarised by resource in the Palau Fisheries Profiles²¹.

Current fisheries research in Palau by the Bureau of Marine Resource and other government agencies includes research on tuna, bycatch, marine biology of the Northern Reefs, efficacy of several marine protected areas, subsistence fishing, coral disease, vulnerable marine species (crocodiles, dugongs, and sea turtles), and spawning/culture techniques (giant clams, groupers and rabbitfish).

Major issues in fisheries research are translating research needs into research activities, analysis of data, collected by research projects, and funding for research.

Other institutions in Palau carry out research that is relevant to the fisheries sector. This includes the Palau Conservation Society, Palau International Coral Reef Center, the Palau Community College, and The Nature Conservancy.

6.4 Education

Education related to fisheries and marine resources in Palau is undertaken in a variety of institutions:

- Basic aspects of fisheries science are taught in the Palau Community College's (PCC) Environment and Marine Sciences Program. Courses include marine biology and oceanography.
- PCC also has practical courses of study related to fisheries, such as the Small Engine and Outboard Marine Technology Programme.
- Academic training in biological, economic and other aspects of fisheries is given to Palau students at the University of the South Pacific in Suva.
- Training courses are frequently organized by the major regional organizations involved in fisheries: the Secretariat of the Pacific Community in New Caledonia and the Forum Fisheries Agency in the Solomon Islands.
- Courses and workshops are also given by NGOs and by bilateral donors, such as those by Japan.
- Many government fisheries officers and other professionals have received advanced degrees in fishery-related subjects at overseas universities, especially those in Guam, Hawaii, and mainland USA.

6.5 Foreign aid

Palau has enjoyed fisheries sector assistance from a range of multi-lateral and bi-lateral donors. Support has included the funding of expatriate staff positions within the Bureau of

²⁰ Izumi, M. (1988). Palau Marine Resources Bibliography. Field Document 88, UNDP Regional Fishery Support Programme, Suva.

²¹ Nichols, P. (1991). Republic of Palau Marine Resources Profiles, Fisheries Development Section, Forum Fisheries Agency, Honiara.

Marine Resource, construction of aquaculture facilities, fisheries infrastructure (docks, refrigeration facilities), equipment costs, the provision of vessels, collaborative research, sector planning studies, and travel costs for training and attendance at meetings.

Important donors have included the US Department of the Interior (through Sea Grant), the US Department of Commerce (Saltonstall-Kennedy allocations), the US Peace Corps, the Japanese Government (through the Japan International Cooperation Agency and Overseas Fishery Cooperation Foundation) and the Pacific Aquaculture Association. Other donors have included UNDP, Australia, New Zealand, and Canada.

Much of the fisheries sector assistance in the past has been channeled through the Bureau of Marine Resource. Recently the Palau Conservation Society has obtained an increasing amount of marine-related overseas aid.

Private foundations are making significant contributions to marine conservation projects in Palau. These include the MacArthur Foundation, Packard Foundation, and Wallis Foundation that are based in the United States, and the Keidanren Foundation in Japan.

7. FISHERY SECTOR INSTITUTIONS

Following the dissolution of the 1980 Palau Fishing Authority in 1997, the main responsibility for coastal fisheries development and management has been vested in the Bureau of Marine Resource (which formerly concentrated on monitoring, research, and aquaculture). The Bureau is guided primarily by the Marine Protection Act of 1994. The coastal fisheries work mandated by the Act and other legislation is translated into institutional functions through the 1996-2020 Palau National Development Master Plan and the 2001 Bureau of Marine Resource Immediate and Medium Term Plan. However, operational policy is guided by precedent and implemented through the day-to-day decisions of senior BMR staff²².

The mission of the Bureau of Marine Resource (BMR) is to provide support and a favorable environment for the sustainable use of the marine resources of Palau by the subsistence, commercial, mariculture, and recreational sectors for the benefit of the people of Palau. To achieve the aim outlined in its Mission Statement, the Bureau has a work program covering a range of different activities in the field of fisheries and marine conservation. These activities are organized within three branches:²³

- The Fisheries Development Branch
- The Fisheries Management Branch
- The Aquaculture and Mariculture Branch
- The BMR also operates two separate programs: the Vulnerable Marine Species Conservation Program, and the Marine Conservation and Protected Areas Program.

The BMR is currently administratively under the relatively new Ministry of Natural Resources, Environment and Tourism. The Bureau is headed by a Director and has a staff of about 35 people. The BMR currently has a government-funded budget of approximately USD 500 000, of which 80% is to cover salaries, with most of the rest covering basic operational costs and utility bills.

Other agencies with involvement in the fisheries sector of Palau include:

- Law-enforcement and compliance with the coastal fisheries legislation is the responsibility of the Division of Fisheries and Wildlife and state government patrol officers.
- Community outreach and environmental awareness is carried out in conjunction with the Palau Conservation Society, the Palau International Coral Reef Center, and the Coral Reef Research Foundation.
- Academic and vocational training and research trials are carried out by the Palau Community College.

²² Source: Palau Coastal Fisheries Action Plan

²³ Source: SPC (2008). The Palau Bureau of Marine Resources. Secretariat of the Pacific Community, Noumea.

- The Palau Visitor Authority is the government agency responsible for marine tourism, operators and industry standards.
- The Palau Sports fishing Association supports the game fishing industry.
- The Environmental Quality Protection Board reviews any coastal development project that may potentially impact on fisheries.

Some of the important internet links related to fisheries in Palau are:

- www.spc.int/coastfish/Countries/palau/palau.htm - General information on fisheries in Palau, including the work of the Secretariat of the Pacific Community in Palau fisheries
- www.spc.int/coastfish/news/Address_Book/Address_book.htm - Marine resource-related addresses in Palau.
- www.palau.gov.net - Provides an overview of the Palau government, including the Bureau of Marine Resource
- www.sprep.org/publication/pein_palau.asp - Palau environment library

8. GENERAL LEGAL FRAMEWORK

The main law relevant to the fisheries sector in Palau is the "Marine Protection Act of 1994." The stated purpose of the Act is to promote sustainably and develop the marine resources of the Republic while also preserving the livelihood of the commercial fishermen of the Republic.

The 17-page document defines important terms, specifies certain prohibited acts (the main regulatory provision of the law, see Box), gives the requirements for permits for taking aquarium fish, gives the power to the Minister to make regulations to carry out purposes of the Act, stipulates a requirement regulations for export labeling/reporting, specifies the enforcement provisions, and establishes penalties.

Box: Prohibited Acts Under the Marine Protection Act of 1994

It shall be unlawful for any person within the fishery zones of the Republic to:

- (1) fish for commercial purposes for, sell, or buy any of the following species of groupers (temekai, tiau) from April 1 to July 31, inclusive: (a) *Plectropomus areolatus* (tiau), (b) *P. leavis* (tiau, katuu'tiau, mokas), (c) *P. leopardus* (tiau), (d) *Epinephelus microdon* (ksau'temekai), (e) *E. fuscoguttatus* (meteungerel'temekai)
- (2) fish for commercial purposes for, sell, or buy any of the following species: (a) Juvenile parrotfish - *Bolbometopon muricatum* (Berdebed) which means for purposes of this Act, a parrotfish less than 25 inches in length; and (b) Juvenile wrasse - *Cheilinus undulatus* (Ngimer) which means for purposes of this Act, a wrasse less than 25 inches in length.
- (3) Commercially export, or fish for, sell, or buy for commercial export the following species: (a) Adult parrotfish - *Bolbometopon muricatum* (Kemedukl); and (b) Adult wrasse - *Cheilinus undulatus* (maml).
- (4) fish for commercial purposes for, sell or buy rabbitfish (*Meyas*, *Siganus canaliculatus*) from March 1 to May 31, inclusive;
- (5) fish for commercial purposes for, sell or buy the following species of rock lobsters (cheraprakl): raiklius, bleyached, or melech smaller than six (6) inches in total length of the carapace, as measured from the tip of the rostrum midway between the eyes to the end of the carapace, or a berried female of any size whatsoever;
- (6) fish while using any form of underwater breathing apparatus other than a snorkel;
- (7) commercially export black teatfish (*Holothuria nobilis* (bakelungal)), white teatfish (*Holothuria fuscogilva* (bakelungal)), prickly redfish (*Thelenota ananas* (temetamel)), surf redfish (*Actinopyga mauritiana* (badelchelid)), sandfish (*Holothuria scabra* (molech, delal a molech)), humphead parrotfish (*Bolbometopon muricatum* (kemedukl, berdebed)), coconut crab (*Birgus latro* (ketat)), mangrove crab (*Scylla serrata* (chemang)), rock lobster (*Panulirus*

longipes fermoristriga, Panulirus versicolor,

Panulirus penicillatus (cheraprukl)), and wrasse (Cheilinus undulatus (ngimer, maml)), except cultured species thereof;

(8) commencing one year after the effective date of this Act, commercially export sea cucumbers (Actinopyga miliaris (cheremrum)) except cultured species thereof;

(9) buy or sell any coconut crab (Birgus latro) smaller than four (4) inches in the greatest distance across the width of its carapace or a berried female coconut crab of any size whatsoever;

(10) buy or sell any mangrove crab (Scylla serrata) smaller than six (6) inches in the greatest distance across the width of its carapace or a berried female of any size whatsoever;

(11) commercially export clam (Tridacna gigas (Otkang)) ; T. squamosa (Ribkungel); T. derasa (Kism) ; T. maxima (Melibes) ; T. crocea (Oruer); and Hippopus hippopus (Duadeb) meat, or part thereof except cultured species;

(12) fish with a gill net or surround net having a mesh size of less than three (3) inches measured diagonally;

(13) fish, after one year after the effective date of this Act, with a kesokes net with no bag portion or with the bag portion having a mesh size of less than three (3) inches measured diagonally;

(14) retain possession of, or abandon, a kesokes net having a mesh size of less than three (3) inches measured diagonally or with a bag portion having a mesh size less than three (3) inches measured diagonally. This subsection will come into effect two years after the effective date of this Act;

(15) until such time as the regulations promulgated pursuant to Section 5 are in effect, take aquarium fish.

Some recent events related to the Marine Protection Act of 1994 are:

- In 2004 FAO carried out a comprehensive review of all existing Palau fisheries legislation, with particular emphasis on features that would enable the implementation of community based fisheries management, aquaculture and fish health management in coastal fisheries.
- In 2005 the Marine Protection Act was amended to clarify that the prohibitions of the Marine Protection Act apply to activities that take place anywhere within the Republic of Palau and to make possession and receipt violations of the Act.
- In 2007 The Secretariat of the Pacific Community (SPC) prepared a public awareness brochure for the Bureau of Marine Resource that explains the major provisions of the Marine Protection Act (available at
- www.spc.int/coastfish/Countries/palau/PalauDomestic2007.pdf).

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