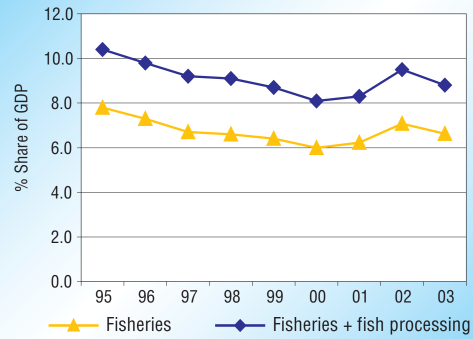
Chapter Six
FISHERIES SECTOR AND ITS POTENTIAL

6.1 Introduction

This chapter provides a brief overview of the Maldivian fishing sector based on various World Bank studies and missions.[58] In addition, the chapter also incorporates findings of the investment climate survey, which included a small number of firms in primary fishing, fish processing, and boat building. Tourism and fishing[59] are key industries in the economy and account for approximately 40 percent of the GDP.

Figure 6.1
Contribution of Fisheries to Maldivian GDP

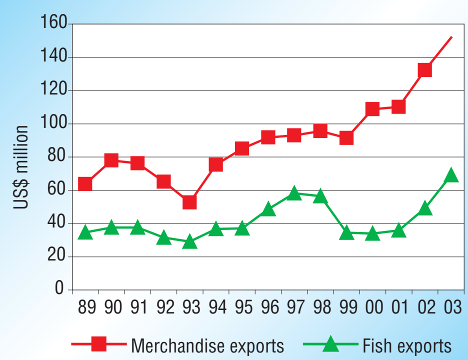


Source: Government of Maldives 1999 - 2001; World Bank 2004

Growth in the fishing industry is variable but has increased since 2002. After relatively slow growth in the fishing industry in the 1990s, including a major decline from 1995, annual growth[60] in the fishing sector has picked up, although it still exhibits high variance in response to global market trends for tuna (figure 6.1). From 1996 to 2003, real growth in the sector was 10.3 percent, but the variance is quite pronounced: 7.2 percent in 2001; 28.4 percent in 2002; and a decline of 0.6 percent in 2003. This increase in net output in the fishing industry in 2002 appears to be primarily generated by increased catches and the firming up of export prices.

The fisheries sector continues to be an important contributor of foreign exchange. Fish-product exports currently generate about $60 million annually, which corresponds to more than $200 per capita (figure 6.2). Although about a third of the annual catch is consumed in the domestic market, fish exports currently account for almost half of the country's merchandise exports, including re-exports (World Bank 1999-2004).[61]

Figure 6.2
Maldivian Fish and Merchandise Exports



Source: World Bank, 1999 - 2004

58 It is based on the findings of a major study of the fisheries sector (World Bank 2002), an update mission and consultant report in 2004, and additional information gathered by Bank missions in September and November 2005 related to a proposed program of economic sector work in fisheries. Contributing material to this report came from consultant papers prepared for the World Bank by Ragnar Arnason (2004) and Gert van Santen (2005).

59 Including fish processing.

60 Based on real value added 1995=100.

61 Where re-exports are included in the merchandise exports.

Maldives' development status is a critical factor for exports. The Maldives currently enjoys Least Developed Country (LDC) status. This secures preferential treatment with regard to development assistance and access to markets. However, with macroeconomic growth, the Maldives is in the process of graduating to the Middle Income Country Status. Although this transition has been delayed by three years to January 2011, when this occurs, the fishing industry's preferential access to certain foreign export markets, especially the European Union, may be adversely affected. Since the European Union is a major (possibly 25 percent in terms of value) and a growing market for Maldives' fish products, and the general import tax is quite high (24 percent), a shift from LDC status would constitute a substantial threat to the fishing industry.

6.2 Current Status and Outlook

The Resource Base

The fisheries sector comprises two quite distinct fishing activities: (a) inshore fisheries consisting of lagoon, reef, aquarium, and recreational (tourist) fisheries; and (b) offshore tuna fisheries focusing mainly on skipjack and, to a lesser extent, yellowfin.

India, Maldives, and Sri Lanka share common boundaries with their Exclusive Economic Zones (EEZ) for fishing. As a result of these common seas, they lack any significant area of international waters.[62] As the EEZs[63] have been established by each country, foreign fishing has subsequently declined. Research from the 1950s indicates that the tuna resources in these common waters consist of yellowfin tuna, bigeye tuna, long-tail tuna, skipjack tuna, eastern little tuna, frigate tuna, bullet tuna, dog-tooth tuna, and the oriental bonito. The last five species are insular, with highly localized migratory habits. The other species are widely distributed throughout the Indian Ocean.

The primary commercial fish species inhabiting Maldivian waters and being exploited is skipjack tuna, which is common to all the warm waters of the Pacific, Indian, and Atlantic Oceans. Skipjack fisheries and exploitation vary across each ocean. The Eastern Pacific and Atlantic Oceans have been heavily fished for the past three decades, while the Indian and Western Pacific Oceans have seen commercial fishing steadily increase over the last two decades (figure 6.3).[64] The Indian Ocean's commercial harvest of skipjack (0.4 million tons) is one-third the harvest level of the Western Pacific Ocean (1.2 million tons). Skipjack is a warm-water species found in equatorial ecosystems. Tagging programs in different oceans indicate that the species tend to have a migratory range of less than 1,500 nautical miles. Skipjack[65] tuna populations in any region are quite sedentary and isolated in terms of their low mixing rates with other skipjack fractions. For Indian Ocean stocks, given the large distances (over 1,000 nautical miles) between different skipjack fisheries, there is a high probability that various fractions of the population such as those found in Maldivian waters could represent isolated fractions of stocks. As a result, the stock

62 Sivasubramaniam, 1985.

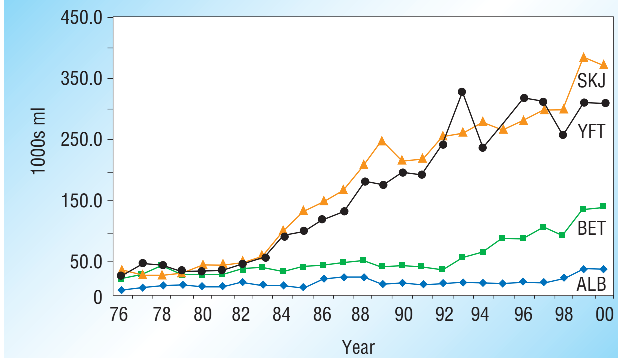
63 The Maldives EEZ extends 200 miles, with an inner zone (within 75 miles) exclusively for Maldivian fishermen, and an outer zone (75-200 miles) for both local and foreign boats.

64 This section draws heavily on work by Fonteneau (2003).

65 MacCall (1990).

assessment analysis for skipjack tuna and its management recommendations could be done at a regional scale (for example Maldives EEZ), rather than for the entire Indian Ocean.[66] This suggestion is confirmed by various researchers in studies of Indian Ocean tuna stocks.

Figure 6.3
Trends in the catch of Tuna in the Indian Ocean



Source: Joseph 2003
Note: SKJ (skipjack), YFT (yellowfin), BET (bigeye), ALB (albacore)

A general conclusion concerning skipjack stocks is that the species is difficult to severely overfish because of its habitat, biology, and behavioral characteristics. According to researchers,[67] skipjack tuna is a species with a short life span and very high rates of natural mortality that lead to high turnover of population. Combined with the species' wide distribution, the result is a huge biomass of fish, and very high levels of potential production.

Since commercial exploitation began in the early 1970s, researchers generally agree that the stock of skipjack across all oceans was not overly exploited and was capable of sustaining much higher harvest levels. However, because of the limited movement of skipjack, there is potential for local overfishing when local fishing efforts and catches are excessive. This local overfishing tends to be restricted to small geographic areas and is not likely harmful for the larger spawning stock. There are few signs of biological overfishing of skipjack tuna stocks within the Maldives EEZ. Efforts are being made by the Government of Maldives to improve biological data on fish stocks and information on fishing efforts in order to develop growth models and subsequent estimates of maximum sustained yield and economic yield for main tuna species. On the other hand, yellowfin tuna, the second most important tuna species in Maldives, does appear to show some signs of overfishing. This is probably more a consequence of the high seas fishery and foreign fishing within the Maldivian EEZ than of overexploitation by Maldivians.

Maldives pole-and-line fishery critically depends on baitfish. Estimates are that at present some 25,000 tons of various baitfish species are being caught throughout the country. In the past several years, fishermen have claimed that baitfish resources were in short supply. Since baitfish requirements have grown substantially in line with pole-and-line catches, it is likely that, while local shortages may have existed and may still exist in locations where many boats fish for bait, the overall status of the stocks remains uncertain. Extensive studies by the Marine Research Council (MRC) suggest that, given the very high fecundity of baitfish and very short life span, the resource is quite resilient.

Reef fishery, another main fishery in the Maldives, shows some characteristics of overfishing. The last major assessment of reef fisheries[68] indicated a sustainable reef fishery of 1,800 metric tons

66 For example Hilborn and Sibert, 1986; Anganuzzi, Stobberup, and Webb, 1996.

67 See Joseph, 2003; Stequert and Ramacharrun, 1996 for example

68 Shakeel and Ahmed, 1996

(+/- 700 tons) per annum. Estimated reef-fish export levels in 1999 were more than 1,300 tons, suggesting that biological harvesting levels may soon be reached. The grouper harvest and the sea cucumber harvest have drastically declined in recent years. Giant clam fishery was banned in 1990 and black coral collection was banned in 1995 due to fears of overfishing. Very little information is available on the third important fishery in the Maldives, aquarium fishery (live tropical fish being collected and sold overseas) and its sustainability.

Sustainability of the Resource Base

Understanding sustainable yields for the main tuna fishery in Maldives is critical for long-term sector development. The most common view for skipjack tuna is based on the previous scientific assumptions about stock biology and behavior.[69] With efficient property rights, the maximum economic harvest is generally less than the biological maximum. Owners of fishing rights are expected to behave rationally and maximize their net returns where marginal cost and marginal revenue are equated. The Maldivian fisheries have been and still are common property fisheries open to all Maldivian citizens. As is well known,[70] this arrangement can lead to an excessive fishing fleet and fishing effort, undue reduction in fish stock levels and, most importantly, complete or near-complete loss of potential economic rents. This theoretical prediction is verified by numerous empirical studies. When the fish stocks are biologically productive and have a reasonably high unit value, as in the Maldivian case, this loss of potential economic rents can easily constitute a substantial fraction (30-50 percent) of the total value of landings.

A slightly diverging view of stock management[71] is that species such as skipjack may have higher migratory ranges than previously thought. In this case, the maximum sustained yield of key tuna species within the Maldivian fishery might depend to a greater degree on fish inflow from the surrounding ocean. The implication is that sustainability in the Maldivian fishery is not primarily determined by the fishing effort within the Maldivian EEZ but by the tuna-fishing effort in the Indian Ocean as a whole. This suggests that in order to preserve the Maldivian fishery, the government must make a determined effort to curtail high-seas fishing for tuna in the Indian Ocean.

The Institutional Structure

Fisheries development in Maldives has been historically handled by three organizations: the Ministry of Fishing, Agriculture, and Marine Resources (MoFAMR) and the affiliated Marine Research Council (MRC); the state-owned Maldives Industrial Fisheries Company (MIFCO); and the Fisheries Advisory Board. Although there is growing private sector participation in the fishing-sector organizations representing firms and/or workers, they are nonfunctional. Current and future sector development could assign new and different roles to each of these organizations. As an example, only a pro-forma fishermen's organization currently exists. In the future, effective management of the sector will not be possible without a regular dialogue between representatives

69 Refer to annex 2 for more detailed material on fisheries management and economics.

70 Gordon, 1954.

71 Arnason, 2004.

of various stakeholder groups and the government. This requires the creation of organizations that can truly and effectively represent the interests of the fishermen (boat owners and crew), processors and exporters, and producers of Maldivian fish. Such organizations may not only represent their members in discussions with the government, they may also play a critical role in coordinating marketing (Maldive fish, fresh tuna), market development (fresh skipjack products), and joint transport.

MoFAMR currently combines traditional sector planning, policy design, regulatory, economic analysis and monitoring, control and supervision (MCS), quality control, and developmental functions. It may need to focus more resources on core planning, policy, and regulatory functions in the future. This might mean transferring responsibility for such activities as training, extension, product development, vessel design, project implementation, monitoring, control and supervision, and investment regulation to new or existing institutions.

MIFCO has been partly privatized; its main operations involving canning, freezing, and processing of fresh fish will be further privatized over time, although the schedule and approach have not been finalized.

The Fisheries Advisory Board has long been the main advisory arm at the ministerial level. Some coordination between ministries has been achieved through the Board, although most coordination in areas such as quality control, MCS, vessel licensing, etc., takes place directly between ministries. The emergence of a substantial private sector in fish catching and processing will fundamentally change the nature of high-level policy discussions and ministerial coordination in the future. The need for coordination between ministries must be augmented by a dialogue between the public and private sectors on key policy and strategy issues. Hence, the nature of the Board and its membership may require adjustment, or it may be replaced by a new institution with more representative membership from the public and private sectors, including fishermen, traders, and processors.

Fisheries Management

World-wide experience over the past 25 years[72] shows quite conclusively that rights-based regimes are by far the most effective in promoting good fisheries management and overcoming inefficiencies caused by open-access management systems.

The MoFAMR is taking important steps to develop new systems of fishing rights through promulgation of new fisheries legislation.[73] The fisheries within 75 nautical miles are still essentially open-access fisheries to Maldivian citizens. According to this new legislation, access to the fisheries will be closed and a system of new permits introduced. Thus, all fishing vessels must be registered and all fishing except subsistence fishing will require a fishing license. The new legislation provides a basis for the adoption of effective fisheries management systems by first requiring the Minister of Fisheries to formulate fisheries management plans and second by vesting in him substantial powers to impose necessary fisheries management.

72 Neher et al., 1988, Shotton, 2000.

73 Government of Maldives, 2004b.

Since the 1970s, a number of nations have adopted new systems for fisheries property rights called individual transferable quotas (ITQ). With reasonably robust and transferable fish quotas, the rights holders have an incentive to conserve fish stocks.[74] In the offshore fisheries, rights in the form of ITQs appear to have good potential for application in Maldives. The reason is that the Maldives is characterized by medium- to large-scale commercial fisheries. There are relatively few landings places, thus the landings enter relatively few processing and distributional channels. Much of the catch is exported. Therefore, enforcement of ITQs is feasible at a relatively low cost. Moreover, the fishery is from a shared stock.

At present, however, the government and MoFAMR lack sufficient capacity for implementing new fisheries management regimes such as ITQs. These would require careful monitoring of the volume of offshore catches or landings. A quota registry to keep track of current quota holdings (initial quota less landings) of individual fishing vessels is also needed. Biological data and information about the operating conditions of the fishing industry would also need to be strengthened in order to set the appropriate total allowable catch based on either biological or economic measures of optimal harvest levels. Finally, an improved fisheries judicial system would be needed to process allegedly illegal activities and to sanction violators.

With inshore fisheries, centralized management and enforcement has proven difficult, given capacity issues and the wide geographic distribution of the atolls. Management on the basis of community fishing rights appears to have good potential. In this approach, the state allocates certain fishing rights to individual communities, which then manage these rights with minimal interference from the state. There are several reasons why this arrangement may be appropriate in the inshore fisheries. The inshore fisheries are spread over numerous lagoons and reefs across atolls. They are generally small and localized. Many of the inshore fisheries are based on local stocks that are separate from those in other atolls and sometimes other lagoons. Thus, the management of these stocks can largely be carried out independently by communities on each island. Even in the case where stocks may be shared, allocation of quota shares to communities would allow them to carry out their own internal fisheries management. Many of the communities in question have good experience utilizing their marine resources. They also have a political and decision-making structure that can form the basis for effective local fisheries management. To overcome the technical and sociopolitical obstacles and introduce these rights-based fisheries-management regimes could take two years or more and require significant internal capacity building and investment.

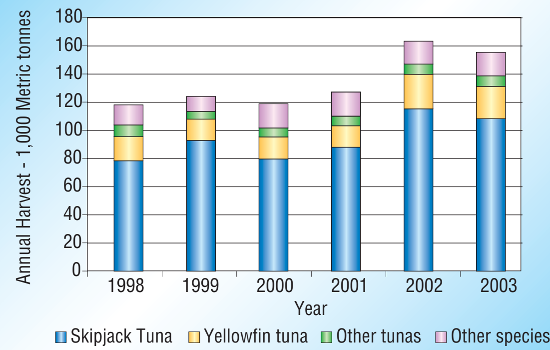
The Harvesting Sector

Harvests of skipjack are increasing and supporting general expansion in primary fishing. The annual fish harvest has increased from 118,115 metric tons in 1998 to 155,415 metric tons in 2003 (figure 6.4). Close to 90 percent of the total marine harvest in Maldives is tuna, of which skipjack is the most important species, increasing its share of the catch from 66 percent in 1998 to 70 percent by 2003. Local tuna consumption accounts for approximately 40,000 metric tons

74 Arnason, 2002.

(approximately 137 kilograms per capita per year), with the balance being processed and exported. The expansion of harvests is largely due to strengthening global prices for tuna from 2001. More recently, projected fish landings for 2005 are estimated to increase from 158,000 metric tons in 2004 to 192,000 metric tons (22 percent growth) based on expanded processing and freezing capacity. As indicated earlier in the chapter, few concerns exist about the sustainability of this level of skipjack harvest. On the other hand, yellowfin tuna and other local fisheries such as reef or aquarium fish may not be in a biological position to sustain higher harvesting levels at this time.

Figure 6.4
Annual Marine Harvest, Maldives 1998 - 2003



Source: MoFAMR, various years

Figure 6.5
Reported Number of Fishermen

Source: MoFAMR, various years

Even though skipjack harvests are increasing, fishing employment is continuing to decline. The fisheries sector is a major provider of employment in the Maldivian economy. Moreover, in many of the outlying atolls, fishing constitutes the main source of formal and informal employment. On a national scale, however, employment in the fishing industry has seen significant contraction (figure 6.5). The number of fishermen, which was remarkably steady at just over 20,000 for most of the 1990s, declined by 25 percent to about 15,000 participants by 2003. Although primary fishing employment represents 10 percent of the labor force, employment is unlikely to return to pre-2000 levels. Principal causes of the employment decline include a reduction in the number the smaller fishing boats and a shift by some fishermen to fewer but larger mechanized vessels, increasing employment opportunities in other sectors such as tourism, and a growing aversion by young, educated men to seek work in the fisheries sector. A high proportion of workers in processing and freezing plants in atolls outside of the main island of Male are foreign, mainly from India, Bangladesh, and Sri Lanka. The recent investment climate survey by the World Bank shows that nearly half of the workers in the fishing, boatbuilding, and processing subsectors had completed secondary school, but these include both local and foreign workers.

The fishing fleet is shifting to larger mechanized vessels with greater capacity. From government records, the number of vessels operating in the fishery industry has remained relatively stable from 2000 to 2003 (table 6.1). The mechanized boats represent more than 80 percent of all inshore vessels. These vessels and the small fleet operating in the outer EEZ currently account for 98 percent of registered fish landings. So, for the purposes of describing fishing activity, it is sufficient to concentrate on this fleet. According to the results in table 6.1, the number of mechanized masdhonis operating in the sector has steadily declined since 1995. This tells a limited story however, as the profile of the skipjack fleet is changing rapidly from the traditional wooden vessels of approximately 15 meters, to fewer but larger vessels of 30 meters or more, often fitted with means of preserving fish on ice or with refrigerated sea water, more powerful engines, and modern fish-locating equipment.

Table 6.1 : **Number of vessels Applied to Fishing**

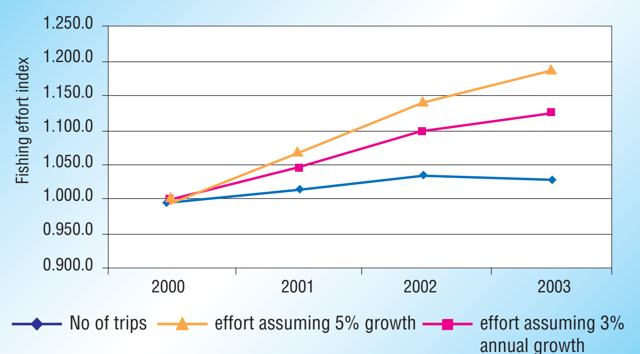
Year	Masdohani		Vadhu			Outer EEZ
	Engine	Sailing	Engine	Others	Total	Vessels
1995	1406	8	52	Na	Na	Na
1996	1397	13	63	Na	Na	Na
1997	1328	9	102	Na	Na	48
1998	1271	30	61	Na	Na	46
1999	1206	52	70	Na	Na	32
2000	1137	41	58	91	1327	49
2001	1128	66	49	53	1296	20
2002	1102	90	59	25	1276	43
2003	1104	115	46	22	1287	31

Source : Government of Maldives 2004a, MoFAMR, various years

It is unclear whether the trend to larger vessels has positive or negative impacts in terms of aggregate net benefits and distribution of benefits to the primary producers (fishermen) and communities (e.g., artisanal processors) [figure 6.6]. Thus, although the number of mechanized inshore fishing vessels has declined, the fishing capacity of this fleet has substantially increased. Fisheries research in Western countries suggests a rule of thumb that the increase in efficiency of a typical fishing vessel of a given size is generally 3-5 percent annually. In Maldives, output volume has increased substantially; primary fishing labor as measured by the reported number of fishermen has been decreased by about a quarter, and capital use appears to have increased by up to 20 percent.

Thus, labor productivity[75] has likely increased due to capital investments in boat capacities and power, increased human capital in the crews as general education levels rise, and subsequent improvement in knowledge about fishing, and fishing conditions, supported by better location gear and the use of Fish Aggregating Devices (FAD).

Figure 6.6
Evolution of fishing effort: mechanized masdhonis



Source: MoFAMR, various years

The magnitude of the fishing capacity increase, however, depends on how much vessel fishing power has actually increased. If fishing power has increased by 5 percent annually since 2000, as could be likely, then the increase in total fishing effort since 2000 can easily be 20 percent or more. These estimates are based on data for the number of fishing trips by vessel classes, which have been collected for some time. But these data do not capture information on

75 Measured as value of output divided by value of labor used.

the estimated fishing power of the vessels making these trips, or on the length of the trips and the distance traveled.

The Tsunami had a moderate impact on the fishing effort. When the Tsunami hit the Maldives, most of the fishing vessels were at sea.[76] As a result, many boats did not get lost or damaged and many lives were not threatened. However, an estimated 76 vessels (17 meters in size) were fully damaged, 25 vessels (of 17 meters) were completely lost, and another 19 (row boats of 2.5 to 3.5 meters) were completely damaged. Approximately 147 boats lost fishing gear and another 123 suffered damage to electronic equipment.

Commercial fishing methods for tuna in Maldives are unique and offer a niche marketing advantage. About 90 percent of all fish harvested in Maldives is with the traditional pole and line method; this allows much better species targeting compared to other approaches such as trawling or purse seining, which can lead to high by-catch of other species, like dolphins. The Maldives commercial fishery is quite unique with the pole and line method, which is emerging as a significant marketing advantage for "green" tuna by processing companies seeking higher penetration into European markets.

The financial health of the primary fishing sector is difficult to quantify. There are few systematic data on profitability in the harvesting sector in Maldives. The MoFARM is building cost and earnings models based on recent surveys of fishermen, which account for fixed and variable costs, fish landings, and estimated revenues. These models are in the early stages of development and further work is needed to improve survey instruments, interview approaches, and methodologies. As these models and underlying data collection are strengthened, more robust estimates of primary fishery profitability may be possible by boat class as well as aggregated for the sector as a whole.

The Processing and Marketing Sector

The sector is based largely on frozen tuna exports. The primary Maldives fish product is frozen skipjack tuna exported mainly to large markets in Thailand and Japan. Frozen tuna sold in Thailand is primarily used for canning, while in Japan it is mainly converted into traditional smoked fish products. In Maldives, freezing facilities are located in Felivaru in the northern regions, and Maandhoo and Khoodoo in the South. Maandhoo has a freezing capacity of 100 metric tons of fish in two twelve-hour shifts, with a total storage capacity of 1,000 metric tons. The Khoodoo facility has a freezing capacity of 240 metric tons of tuna in two twelve-hour shifts, with a cold-storage capacity of 1,900 metric tons.

Production of canned tuna began in 1977 as a joint venture between the government and a Japanese company. In 1986, a new facility was built by the government with a production capacity of 50 metric tons per day. Given the normal yield in canning operations of 30 to 35 percent of total fish input, a significant volume of waste is generated. The Felivaru cannery converts this residual output into fishmeal, with the primary market in Sri Lanka as poultry feed.

76 Nagy, 2005.

An emerging market for fresh tuna for Sashimi is developing in Japan. This market is based on large, high-quality yellowfin or bigeye tuna, individually boxed and iced, and then flown directly to Japan for sale in auction markets. Katsoubishi, a higher-value dried fish product, is now being produced in Khoodoo for the Japanese market. Fresh frozen tuna loins are also being produced as a high-quality, high-value export into the European market, primarily the United Kingdom.

The volume and composition of fish exports has increased greatly since 2000. This is a reflection of both higher catches and export prices since 2002 (table 6.2). At the same time, there has been a certain shift in production toward higher-valued products such as cooked tuna loins. Somewhat surprisingly, this has not been reflected in a significantly higher unit value of exports, at least as reported by the customs statistics.

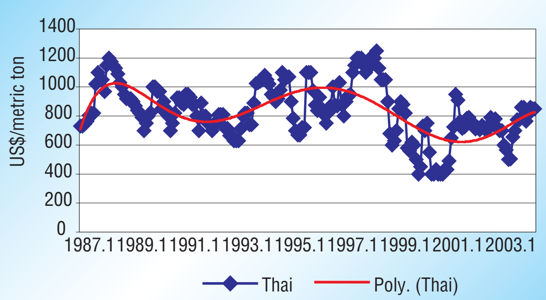
Table 6.2 : **Export Volumes and Values, 2000 to 2003**

Year	Volume	Value	Price	Value	Price
	1000 mt	1000 Rf	Rf/kg.	1000 US$	US$/kg
2000	57.3	481915	8.41	40944	0.71
2001	64.8	538337	8.31	43981	0.68
2002	79.3	716706	9.04	55992	0.71
2003	112	978778	8.74	76467	0.68

Source : Government of Maldives and MoFAMR, various years

World market prices for tuna are cyclical and have been increasing since 2000. Frozen tuna is a commodity that is marketed globally. Since 1987, average prices on the Thailand market for frozen tuna have fluctuated in cycles of approximately 7 years (figure 6.7). Similar trends have occurred in other frozen tuna markets around the world. The last trough in market prices for frozen tuna was around the year 2000. Average prices have climbed through 2003 to the present, although they are still about $200 per ton lower than some of the peak prices recorded in 1997-98. The current market price for frozen skipjack whole tuna in Europe is about $820 per metric ton. By contrast, fresh frozen skipjack loins are selling for approximately $3,150 per metric ton.[77] The short-term market outlook for tuna is mixed. Although prices have been rising in the past few years, high fuel prices are reducing profit margins to a minimum in the tuna-harvesting sector.[78]

Figure 6.7
Frozen tuna prices: Thailand market



Note: Prices are for landed price in Thailand. Poly.(Thai) represents a polynomial trendline. Prices are averages for January each year.

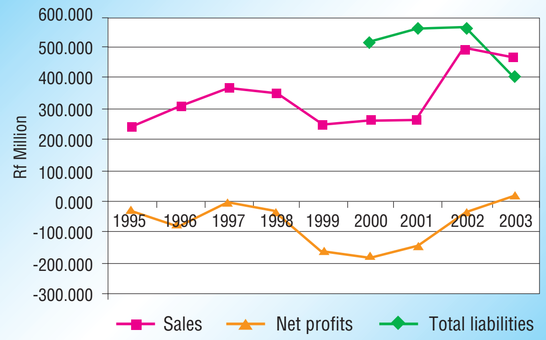
The structure of the tuna processing and the follow-on marketing sector in Maldives is changing. Processing and marketing activities are still dominated by MIFCO, established in 1993 to meet a perceived need for more advanced domestic processing of tuna in the face of declining sales of traditional smoked and dried tuna products sold in Sri Lanka. MIFCO was established as a state-owned fishing company, acquiring existing facilities run by the then State Trading Organization. MIFCO was granted exclusive rights to processing and exporting frozen and canned skipjack in Maldivian waters. The company was provided with government loan guarantees but did not receive direct government finance. MIFCO soon established a canning factory in Felivaru and later freezing

77 FAO, 2005a.

78 FAO, 2005b.

plants and cold storage facilities in Koodhoo and Maandhoo. In addition, it invested in collector vessels and mother vessels to gather fish from the various atolls and islands. MIFCO operated by setting fixed floor prices for the fish it received. These prices were uniform across the Maldives, representing regional equalization through cross-subsidies to the more remote islands (relative to MIFCO's plants) and an indirect tax on fishermen operating from the better located islands.

Figure 6.8
MIFCO: Sales, Profits and Liabilities



Source: Government of Maldives, Ministry of Finance

For the first few years, MIFCO was close to breaking even. However, with falling (skipjack) tuna prices in 1998, and rising fuel prices and increased rates of interest in 2000-2001, the company suffered very heavy financial losses (figure 6.8). As a result, the company defaulted on its debt, which then had to be served by the government, as the guarantor. The losses continued in 2002 but at a declining rate as MIFCO management took defensive actions by reducing floor prices for fish and trying to rationalize fish collection and processing.

In 2001, the government embarked on the financial restructuring of MIFCO. This process was completed in January 2003. The financial restructuring consisted of the following main items:[79]

- Infusion of cash (MRf 20 million or $1.5 million).
- Nominal interest on MIFCO's long-term debt owed to the government, amounting to approximately MRf 260 million ($20 million), was reduced from 12-13 percent to 6 percent.[80]
- MIFCO's short-term debt of between MRf 65 million and MRf 100 million ($5 million and $7.7 million) at high interest rates was converted to long-term debt at 6 percent nominal rate of interest.
- Government took over the loss-making Mandaloo freezing plant[81] with liabilities of approximately MRf 166 ($13 million). This plant was subsequently resold to a private operator for about MRf157 million ($12 million).

At the same time, the company undertook further rationalization, especially in its canning factory at Felivaru (whose efficiency was reportedly increased by 25 percent). The company also improved its quality control in all its operations. The result was that the company was profitable in 2003 (without debt servicing), the first time since 1997. Aside from the debt burden, the future outlook is reportedly good, although the recent increases in world fuel prices may alter this view.

79 Note that these are rough figures.

80 This is debt initially taken by the government and then re-lent to MIFCO. This debt was in arrears and interest had accumulated.

81 Located in Zone III, which, as a part of opening up the processing and export sector, had been vacated by MIFCO.

Privatization has also accompanied these structural changes. The major change in the institutional framework since 2000 has been liberalization in the processing and export sector. The processing (canning, freezing) and export monopoly of MIFCO, which used to cover the whole archipelago, was withdrawn from the northernmost region, referred to as Zone I and the southern middle region, Zone III. The remaining zones (II and IV) remain unchanged at this point, although the government is committed to further privatization. Following MIFCO's withdrawal from Zones I and III, licenses to operate in these areas were opened to bids from the private sector and eventually granted to four private companies, two in each zone. These companies, all with 100 percent local shareholding, are: Island Enterprises and Jausa Fisheries operating in Zone I, which received their licenses in 2002; and Horizon Fisheries and Funadoo Tuna Products in Zone III, which received their licenses in 2003. As a result, competition for fish to process and/or export has increased, and fish prices have become more flexible and favorable to fishermen. Field visits in September 2005 revealed that prices paid to fishermen by the private companies were usually higher than the floor prices set by MIFCO.

Investment Climate for the Fishing Sector

The government needs further private investment if the sector is to continue modernizing and remain competitive in global markets. Current private ownership is limited to the four small processing companies, several boat builders, independent fishermen, and small producers of smoked fish. The recent investment climate survey confirmed the small structure of existing operations: the majority of firms (79 percent) have less than 50 employees. The median number of permanent workers is 15.5 persons. The average asset base per firm is about $1.7 million. The sector is also characterized by high gender imbalance, with only 9.2 percent of the workers being female. This reflects religious and cultural factors, as women do not wish to work away from home for extended periods of time (for example, on distant islands with processing facilities).

The positive side of the investment climate includes large skipjack tuna stocks, a highly educated labor force, few delays in importing or exporting goods, and use of e-mail for communications. As discussed earlier, there are few concerns at the moment in light of the sustainability of skipjack tuna stocks and the ability of these stocks to support increased fishing effort. Workers and managers in the sector are fairly well educated. As alluded to earlier in this chapter, almost half of the general labor force among firms responding in the recent investment climate survey had completed secondary education. This also is reflected by 66 percent of the labor force being classified as "skilled." Fourteen percent are classified as "professional" and the remaining 20 percent as "unskilled." Among top managers, 35 percent either had some university training, or had completed a degree, including a postgraduate degree (7.1 percent). While this is a positive attribute for investment, in the Maldives cultural environment as mentioned earlier, many educated young men no longer find work in the fishing sector an attractive career option. Another positive aspect of the investment climate is that the average number of days to clear imports or exports is 2.5 and 2.6 days, respectively; this is one of the lowest rates in the world. At the same time, 92 percent of the firms use e-mail for communications, reflecting the high-quality communication system in the country. It is possible for people on even fairly remote atolls to have access to mobile phone networks and e-mail/Internet services.

The negative side of the investment climate is led by poor access to finance. Of 20 potential factors identified as major or severe constraints for operations in the investment climate survey, the top-ranking issue, cited by 57 percent of fishing sector firms surveyed, was access to finance. Tied for second place (cited by 50 percent of firms surveyed) were access to land, regulatory uncertainty, the cost of finance, and legal systems. This is corroborated by the fact that 42 percent of firms also highlighted access to finance as their biggest single obstacle. The Maldives has only six commercial banks. The banks have high liquidity but also carry strict regulatory requirements and offer few options for people and firms to invest savings. There is still a mismatch between bank deposits (which generally earn nominal returns of only 1-2 percent) and the term lending for resorts and fishing boats, which attracts real interest rates of between 7.5 and 8.5 percent. Loans are normally financed on the basis of collateral rather than cash flow, which inhibits small businesses or private owner-operators (for example, boat builders) from obtaining commercial finance. For the new large boats being constructed, financing is usually from personal savings or informal loans from friends and families.

Taking account of these investment climate pluses and minuses, the four existing private processing companies are investing in infrastructure and building up their operations. Projected fish landings for 2005 were estimated to increase from 158,000 metric tons in 2004 to 192,000 metric tons (22 percent growth) based on expanded capacity in collector vessels (173 metric tons per day) and land-based freezing facilities (120 metric tons per day). Private capital investments to finance these recent developments are more than $42 million. Diversification of product lines is under way as investors plan for construction of additional canning and tuna loining plants.

Investment plans also extend to fishing activities in the outer EEZ. Private investors, through local associates, have been licensed to operate tuna long-liners in Maldives "outer" EEZ for some time; currently some 40 vessels have been issued annual fishing licenses. At least one investor, who currently is licensed to operate foreign vessels, is planning to create shore-based facilities on a yet-to-be identified atoll to handle and forward the outer EEZ catch.

Another potential investment area is tuna transshipments, but it is not clear if Maldives would have a competitive advantage. Virtually all long-line- and purse-seine-caught tuna in the Indian Ocean is transshipped at sea or in ports outside Maldives. Given its location, Maldives may have some comparative advantage to develop transshipment facilities for foreign and locally caught frozen tuna. However, in order to be successful, such a facility should be able to compete with existing transshipment facilities in countries such as Seychelles. In the future, local licensing agreements for foreign and local tuna long-lining vessels may stipulate that a percentage of the catch be landed and processed locally. All of these factors suggest the need for a careful review of investments in tuna transshipment facilities and facilities at major airports to handle and temporarily store fresh tuna for export.

Aquaculture (mariculture) is another area with investment potential. The Maldives, with their numerous and sparsely populated islands, sheltered lagoons, and extensive reef areas, are well suited for warm water mariculture. This could support incomes in the outlying atolls in accordance with the Maldives' social policy. However, economically successful mariculture is not a simple undertaking, even when the environmental conditions are good. Among the critical factors are the selection of species to be cultured, the market potential, and the potential environmental impacts of its development in fragile tropical environments, including coral reefs and seagrass beds. Noting this, the government, with the support of the Kuwait fund, has embarked on an extensive feasibility study of mariculture in Maldivian waters. A draft report by the main consultants, Canadian Fishery

Consultants Ltd. from Nova Scotia, contains encouraging results concerning options for mariculture and the associated social benefits. However, the report does not contain a reasonably complete study of the commercial viability of such projects. Neither does it contain a satisfactory risk analysis that takes into account the possible external effects of mariculture in the Maldivian environment. Finally, it does not take adequate account of alternative uses of the marine resources in question (e.g., for tourism and fishing) and the implied opportunity costs of mariculture. Thus, at this stage it would be premature to herald mariculture as an ideal development opportunity for the Maldivian economy. Nevertheless, the evidence to date is sufficiently encouraging to warrant a degree of guarded optimism.

As indicated earlier, MIFCO has already been partly privatized; its remaining operations involving canning, freezing, and processing of fresh fish will be further privatized over time. The government has committed to privatizing the remaining assets of MIFCO in the future. Although no date has been set, the nature of this privatization will have a major impact on the company's future effectiveness, and the process needs to proceed with caution. While various privatization scenarios are possible, to be effective in the future the company will need to strengthen its relationship with its main suppliers, the fishermen. Hence a dilution of public ownership combined with an increase of direct stakeholder ownership may in the future be a favorable option. This will require changes in the structure of the company, developing a process of educating fishermen, and issuing new shares to specific target groups such as active and retired fishermen, populations of specific fishermen villages, people involved in Maldivian fish production, etc. Obviously the privatization of MIFCO could be done in very many different ways (box 6.1).

Any combination of these alternatives and others represents possible options for privatization. Different options may have quite varying short-term and long-term implications. The economic solution should be based on efficiency. On the other hand, the social problem is to select the option that is most in accordance with the Maldivian social objectives identified by government, recognizing the income-equalization role that MIFCO has played with floor prices for fish across all atolls. Therefore, to proceed in a sensible way, it is crucial that government set down explicitly its vision for the industry of the future and the objectives it would like the privatization to achieve. Given these objectives, it is then essentially a technical matter to select the optimal combination of privatization alternatives.

The fisheries fiscal framework is closely linked to investment decisions by the private sector. According to Maldivian law, no taxes can be raised on fishing and the export of fish products, except those produced by foreign parties. Since the government in the more distant past was totally dependent on the fishing sector to generate the revenues needed to pay for food imports, this legal requirement has historically been dealt with through a variety of financial constructions such as an export levy on processed fish. As the sector moves more into a commercial and privatized model, the government needs to identify options for tapping a fair share of rents from a public resource that can be used to support monitoring and management, as well as other national development requirements.

At present, no official investment policy is applicable to these kinds of sector investments except for those contracted with the government for skipjack processing and export. All other applications are reviewed on an ad-hoc basis. Maldives needs a consolidated and coherent investment policy for offshore and onshore investments in all major fisheries that is transparent and clearly defines the rights and obligations of investors, while fully reflecting the long-term policies and development strategies of the government.

Box 6.1 : **Options for further privatization of MIFCO**

(1) Should MIFCO be privatized as a one entity or should it be broken up?
   a. If MIFCO is sold in parts, how big should the individual parts be?

(2) Should current market or competitive restrictions continue to apply after privatization?
   a. Should the current restricted licensing (limited number of companies in each zone) continue or should there be free access?
   b. Should there be geographical restrictions on company operations (fully/partially/not at all)?
   c. Should there be restrictions on subsequent consolidation or, for that matter, breaking up of companies?
   d. How should these restrictions, if any, evolve over time (i.e., be unchanged, diminish, and so on)?

(3) Should the privatization be accompanied with social-industrial obligations?
   a. How should social-industrial obligations such as collecting fish, the geographical coverage of the fish collection, offering a uniform price, fuel supply, and so on be handled?
   b. How should these obligations evolve over time (i.e., be unchanged, diminish, and so on)?

(4) Should the privatization be by sale or allocation (e.g., of shares) or a combination of the two?

(5) If allocation:
   a. Allocation to whom (e.g., individuals, islands, atolls, associations of fishermen, regions)?
   b. What method of allocation (e.g., equal, lottery, need, other considerations)?
   c. Should subsequent sales of shares be restricted?

(6) If sale:
   a. How important is the selling price?
   b. What method of sale (auction, closed bids, prebids and negotiation, piecemeal selling of shares, and so on)?
   c. Should islands, atolls, regions, fishermen's association have any special buying rights (e.g., right of first refusal)?

(7) Should foreign ownership (direct and indirect) be allowed?

SECTORAL OUTLOOK: KEY CHALLENGES AHEAD

What is the Sectoral Outlook?

The fisheries sector in Maldives still faces difficult challenges despite having a reasonably positive business outlook and investment climate. As indicated earlier in the report, concerns have been raised by government and other stakeholders about possible declining fish stocks in some species such as yellowfin tuna, and temporary pressure on local fish aggregations. Further, the outlook for increased GDP contributions is uncertain, and capital/labor substitutions may lead to more reductions in primary fishing employment. Several factors that appear to be affecting fisheries sector development include: (i) continued public sector involvement in the tuna industry; (ii) impediments to private sector investment, such as access to capital; (iii) inadequate physical infrastructure for fisheries; and (iv) limited institutional and human resource capacity, particularly in MoFAMR. Possibly most important is the sector's continued vulnerability to external shocks from fluctuating tuna prices in the world market. The current export-product mix is not well diversified and, as a result, is overly dependent on products facing highly mature and monopsonistic markets. Although prices for the main tuna products have firmed up in the past 3-4 years, demand is relatively stable, with prices determined largely by supply forces. Markets are therefore highly cyclical. Coupled with rising world fuel prices, a major decline in global tuna prices would leave the fisheries sector in Maldives again very exposed.

What are the Policy and Investment Priorities?

To sustain future fishing sector growth, the country will need to balance two fundamental risks. On the one hand, it can continue to rapidly expand production and exports in markets in which it has traditionally operated, facing high risks of strong future pressures on prices and margins while remaining a modest producer in global markets. Or it can aim at targeting fresh fish markets with new products, optimizing net national benefits rather than production. The fishing sector, both through MIFCO and private firms, has already proven its ability to export fresh and frozen yellowfin. It can experiment with exporting high-quality fresh and frozen skipjack products for direct human consumption. In the short term, the country has no choice but to expand output of commodity product; however, the rapid expansion of the local fishing effort in the past few years necessitates a review of the economic aspects of fleet expansion, and of the current imbalance between catching and processing capacity. Maldives would aim to keep its key comparative advantage of maintaining an economically efficient, low-cost fishing fleet. In the longer term, the ultimate choice will be how to reduce the country's relative dependence on low-value commodity production.

Any move from producing processed tuna to fresh tuna will require the country to quickly adjust its shore-based infrastructure, rapidly expand the use of fish cold storage on boats, develop new airports and other transport facilities on more remote atolls, and formulate new strategies to attract local and foreign investment. Necessary adjustment of the fleet, processing plants, airport infrastructure, and internal logistics can be made relatively quickly; adjustment of the regulatory and incentive framework will require careful study and implementation. Coordinated industry efforts to test new products and develop new markets will require carefully organized public support.

The sector strategies outlined above will also require special efforts to ensure that fishing communities benefit from the development of new products and new markets and, for those that cannot, to provide viable alternatives. Traditional production of Maldivian dried/smoked fish also requires a new approach; the dependence on a monopsonistic single market such as Sri Lanka has limited Maldivian benefits. Higher-quality products are needed and new markets must be identified, while marketing strategies in traditional markets require adjustment. In areas with limited alternative economic options, government policies will need to balance support for maintaining viable production of traditional products with the need to enhance fishing sector efficiency, taking into account the high social and economic costs of migration to Male.

Past efforts at expanding coastal and reef fisheries without effective management measures in place led to quick depletion of the targeted resources. Since most of these products are more valuable for the tourist industry in the water than on consumer plates and since development of a management regime will take considerable time, practical measures are needed to quickly halt exploitation of these species. These measures include more stringent export controls on live tropical fish and closer cooperation with the tourist industry to share management responsibilities around commercial tourism atolls.

Efforts to develop mariculture as an alternative source of fisheries income have had some technical successes, but the commercial viability of new techniques in Maldives remains to be proven. Ongoing efforts to test mariculture production and establish the regulatory and support structures needed for future commercial development should be completed; new mariculture initiatives should focus only on commercial development.

Sector development in the past depended on and was directed by action and investment dominated by the public sector. Future sector development will require a very different public role, enabling and supporting private sector initiatives and investments, encouraging new developments, mitigating imbalances, and effectively providing critical public services in areas like human resources development, MCS, extension, quality control, and research. Future sector development will also include strengthening the public capacity to design and implement sector policies and enforce a business-friendly regulatory environment aimed at developing a highly competitive and quality-oriented export industry. Adjustment of the character of public interventions, more effective coordination of sector-related public interventions, and adjustment of the capabilities of MoFAMR should receive high priority from the government.