
REVIEW OF SUBSIDIES PROVIDED TO THE ARTISANAL FISHERIES SECTOR
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1. INTRODUCTION

Fish are of fundamental importance to the social and economic wellbeing of the inhabitants of the Seychelles. The fisheries sector has an unrivaled role in ensuring food supply and food security for the nation and plays an important part in the promotion of the government's integrated economy concept, where fisheries supports other sectors of the economy such as manufacturing and tourism. Most of the fish protein that is consumed locally comes from the small-scale artisanal fisheries operating over the Mahé Plateau, an area of about 41,000 km², of which the greatest part lies at depth of between 50 – 65 m. The plateau is closed to industrial fishing but is fished by about 140 whalers and schooners, at least another 400 outboard vessels as well as sport/recreational fishing boats. The demersal fisheries exploit a high diversity of species and habitats, with recent analysis of fishing effort using vessel monitoring system (VMS) data showing that most of the Plateau area is fished extensively.

The long-term policy of the Government of Seychelles for the fishing industry has been the *“promotion of sustainable & responsible fisheries development & optimization of the benefits from this sector for present and future generations”*. Over the years, emphasis has been placed on generating the maximum amount of employment from the sector with a firm commitment to ensuring that the livelihood of fishermen and those involved in supporting activities are maintained or enhanced. In order for the government to uphold its responsibility as a facilitator to encourage investment in the fisheries sector, for its development, certain fiscal and monetary measures and mechanisms were put in place. In 2008, these were incorporated as one package within the Fisheries and Agricultural Incentives Act (AFIA). However, certain aspects of the AFIA – such as GST, social security contributions and foreign exchange retention – became irrelevant, so the Act was repealed in 2015. Despite this, the sector continues to benefit from concessions, particularly tax exemptions and ice subsidies, under various new laws.

As a result of concern on the long-term sustainability of the demersal fishery and the need to ensure the sustainable exploitation of the Mahe Plateau, the Seychelles Fishing Authority (SFA) started work to prepare a demersal fishery management plan in 2014 and implementation is expected to start in 2017. However, as the fishery is currently open access, the existence of incentives for the sector has over the years made the artisanal fisheries sector attractive to investors, as such creating an influx of effort in the sector which could potentially impact on the success of the management plan.

The Government of Seychelles has been working with the International Sustainability Unit (ISU) of The Prince of Wales' Charitable Foundation on identifying mechanisms to finance the transition of the demersal fishery to biological and economic sustainability. In September 2014, a report was published by Vivid Economics on the benefits of transition to a sustainable demersal fishery on the Mahe Plateau and among the key recommendations suggested to achieve this objective, it was identified that there is a need to develop a plan to phase out subsidies. It was stated in the report that should be subsidies be phased out, this would release substantial savings to the government which could be directed to other public expenditure or to reduce public debt.

2. OBJECTIVES

The objective of this Study is to review all of the subsidies allocated to the artisanal fisheries sector and work out the impacts on typical vessels (outboards, whalers and schooners) based on changes in variable and average costs. This Study also analyses the impact of removal of subsidies at macro level on supply, demand and price dynamics both on the domestic and export markets. This Study also considers removing subsidies under three different scenarios: immediate withdrawal, phasing out over three to five year period or over ten year period. Finally, this Study makes recommendations as to which subsidies to withdraw and the related mitigating measures which may be implemented.

It should be emphasised that this Study has been commissioned as part of recommendations of the Vivid Economics Report 2014 which focused on a bio-economic model within the context of the Demersal Fisheries Management Plan for the Mahe Plateau. Consequently and in line with its Terms of Reference this Study is centred on artisanal fisheries sector, and does not consider the semi-industrial fisheries sector.¹

3. BACKGROUND AND CONTEXT

There has been growing controversy over the provision of concessions to the fisheries sector, particularly the tax rebates on fuel. The increasing interest of investors and the addition of new vessels to the artisanal fleet have intensified the debate. The government budget for fuel duty refunds to boat owners has increased steadily from SR 19.6 million in 2010 to SR 26.3 million in 2015.

In 2015, according to statistics held at the SFA, 490 vessels were active. Other than the three vessel types listed below, 3% of the total landed artisanal catch is accounted for by fishermen on foot and pirogues which have been omitted from the analysis.

In 2015, there were 11 active vessels involved in the semi-industrial long line fishery which landed a total catch of 194.6 MT with half the catch composed of yellowfin tuna and the remainder being swordfish and bigeye tuna.

Table 1 - Key Statistics for Artisanal Fishery (2015)

	Whalers	Schooners	Outboards
Number of vessels	104	27	340
Total Catch (MT)	1293.3	270	1450.3
Catch per vessel (kg/vessel)	12,436	10,000	4,266
Number of trips per year	35	21	40

Source: SFA

¹ It is known that semi-industrial vessels were allowed to temporarily exploit demersal stocks between 2013 – 2015 during which time swordfish could not be exported since it did not meet EU quality and standards requirements. However, there remains concern that certain semi-industrial vessels may have continued to exploit demersal stocks from time to time. As such, it is recommended that there should be more stringent monitoring and enforcement to ensure that semi-industrial vessels do not engage in demersal fishing.

4. INCENTIVES TO THE FISHERIES SECTOR

In the early 1990s, the Government introduced a fuel rebate scheme as part of Government's policy to ensure food security for the local population by making available an affordable supply of fish as well as to improve the livelihoods of fishermen.

In 2005, all incentives to the fisheries sector were consolidated into the 'Agricultural and Fisheries Incentive Act' (AFIA) and beneficiaries included boat owners, fishermen and fish processors. In 2014, when the AFIA was repealed, the various incentives were incorporated under the Revenue Administration Act (2011) and the Customs Management Act (2011).

Below is a summary of the existing direct incentives available to the local fisheries sector.

4.1 Concession on Business Tax

Fishermen are not necessitated to pay business tax and boat owners and processors are only liable to pay a 15% flat rate on income above SR 240,000 per annum.

4.2 Accelerated Depreciation

Special rates of depreciation apply on capital investments, other than land and buildings.

Year	%
1	45
2	40
3	20
4	15
5	5

4.3 Fuel Concession

Boat owners are entitled to apply to SFA for a refund of SR8/L of fuel consumed for the purpose of commercial fishing.

4.4 VAT Concession

Exemption of VAT on goods imported as bait, safety equipment and capital equipment (i.e. any equipment used solely in the production or processing of commercial fishing activities having a value of more than SR 1,000 and including construction materials, boat building materials, refrigeration trucks and forklifts) - **0% VAT**.

It should be noted that VAT exemption is only allowed at point of entry and customs clearance including bonded warehouses. As per VAT regulations, boat owners are not allowed to benefit from VAT exemption when purchasing goods which have already entered the domestic market.

4.5 Duty Concession on commercial motor vehicle

50% of applicable Customs duty. However, VAT and Levy fully applicable.

4.6 Concession on Sale of Ice

Boat owners are being sold ice at a subsidised rate of SR 30/50 kg bag as compared to SR80/50 kg bag priced for the public. It is estimated that it costs SR1 to produce 1 kg of ice while it is sold by SFA at SR0.60 per kg. SFA is therefore currently bearing the additional costs of **SR 0.40 per kg of ice** sold to boat owners.

4.7 Gainful Occupation Permit (G.O.P) -

Industry Category	Percentage of non-Seychellois workforce
Semi-Industrial	75%
Sea Cucumber Fishery	75%
Mariculture	70%

G.O.P fee is SR 500 per person per month.

It should be noted that the employment of non-Seychellois is not allowed in the artisanal fishery sector and is only possible in the above mentioned sub-sectors.

4.8 Concession on Income Tax

In case of fishermen employed by a Boat Owner, a flat income tax of only **Rs 100** per month per fisherman is payable.

4.9 Sickness Benefit Scheme

Fishermen receive SR. 63.00 per day for the first 20 days they fall sick during one year and thereafter SR. 42.00 for each additional day for which a claim is lodged.

4.10 Concessionary Insurance Scheme

SFA covers 50% of Boat Owners' net premium which is 4% of the insured boat value.

4.11 Concessionary Loans

In view of high cost of borrowing from commercial banks (prime lending rate in excess of 11%), Government has put in place the following concessionary loan schemes for the fisheries sector:

Small Business Financing Agency (SBFA)

- Loans up to SR 300,000
- Interest rate on loans up to SR 75,000 – 4.5%, Interest rate on loans > SR 75,000 is at 4.7%
- Loan duration should not exceed 8 years and grace period shall not exceed 6 months
- Application fees of 1% on loans up to SR150,000; application fee of 1.2% on loans > SR 150,000
- No personal contribution required
- Processing fee of SR 100 on loans up to 150,000; processing fee of SR 150 on loans > SR150,000

Development Bank of Seychelles (DBS)

General

- Interest rate is at 10%
- Loan duration should not exceed 15 years and grace period shall not exceed 3 months
- Total cost of investment project shall not exceed SR 5.88 Million
- Application fee is 1% (ceiling SR 20,000)
- Minimum personal contribution is 10%

Fisheries Development Fund (FDF)

- Application fee is 1% of the loan amount – (ceiling SR5,000)
- Interest rate is at 3%
- Loan duration is 10 years (with extension for 12 years) and grace period shall not exceed 6 months
- Minimum personal contribution is 5%
- The total cost of each investment project shall not exceed Euro 500,000
- Any Seychellois entrepreneur with the ability to raise 15% of the investment cost qualifies to benefit under the FDF

Small and Medium Enterprise Scheme

- Loans up to SR 3 Million and is not applicable for refinancing of existing loans
- It has a two-tier interest rate:
 - a) On the first SR1 million the client will pay 5%
 - b) On the next SR2 million the client will pay 7%

Any additional amounts above SR3 million, interest rate shall be determined by the bank.

- Repayment period is 5 to 7 years and grace period shall not exceed 6 months
- Mandatory personal contribution shall not exceed 2.5% of the value of the loan
- Application fee is 0.25% of the loan amount - (maximum SR7,500/-)

4.12 License Fees

Artisanal (and semi-industrial) boat owners benefit from highly subsidized license fees from SFA. Such fees are currently SR 100 per annum and do not reflect the resource value as well as the management costs associated with the fishery. Furthermore, any licensed vessel is entitled free of charge a number of onshore facilities as listed in 4.13 below.

4.13 Other Indirect Incentives

It should be noted that SFA also provides indirect incentives to the fisheries sector, such as research and infrastructural support (quays, fish markets, and gear stores). Among other onshore/quay facilities, artisanal boat owners can also avail of security services, lighting, water and access to power as well as petrol depots managed by SFA at its own cost.

These have not been considered in this Study since removal of such indirect incentives is not being envisaged and does not constitute part of the Terms of Reference of this Study

5. COSTS OF SUBSIDIES TO THE FISHERIES SECTOR

The artisanal demersal fishery is heavily subsidised, particularly with capacity enhancing or harmful subsidies such as fuel which is known to promote overcapacity and overfishing. This reduces the annual costs of fishing by more than SR 47 million, as shown in Table 2 below. Such subsidies constitute approximately 25% of the landed value generated by this fishery, estimated at SR 190 million in 2015.

Table 2 - Estimated Costs of Subsidies (2015)

	Amount (SR Million/yr)	Share
Concession on Fuel	26.3	55%
Concession on Ice	6.37	13%
Gear VAT exemption	4.83	10%
Vessel VAT exemption	10.22	21.4%
Loans, Income/business tax exemption, sickness benefit	Not available	-
Total	47.74	100%

Source: SFA

Other incentives to the fisheries sector such as income and business tax exemption, sickness benefit payments for fishermen and concessionary loans have not been taken into account in this Study due to lack of available data.

5.1 Fuel Duty Exemption

As shown in Table 2, the fuel subsidy, at SR 26.3 million is by far the single largest and accounts for 55% of total subsidies.

Boat owners registered at the SFA and licensed for commercial fishing are able to apply for a tax refund on fuel purchased and used for their fishing activities. As part of their recurrent budget, SFA is allocated a budget for the fishermen fuel incentive scheme.

In 2015, the fuel subsidy of SR 26.3 million was refunded to an estimated 415 boat owners involved in the artisanal fishing sector.

At the time of writing this Report, there was insufficient data available from SFA to classify the value of refunds according to the main vessel types.

5.2 Ice Concession

As illustrated in Table 2 above, the concession on ice, which amounted to SR 6.4 million in 2015 represented 13% of total subsidies.

In 2015, SFA had under its management 5 ice plants, namely at Anse La Mouche, Bel Ombre, Providence, Anse Royale and Baie Ste. Anne Praslin. While SFA collects the revenue from ice sales, the cost of producing ice still requires subsidising.

Using information provided by SFA, government subsidises SR 0.40 for every kg of ice produced. It has been calculated that providing ice at the concessionary price of SR 30 / 50 kg costs the government SR 6.4 million per annum. This includes cost of utilities and salaries as well as repairs and maintenance to the ice plants. Capital cost recovery has not been factored into these calculations since the ice plants were donated to the Government of Seychelles.

5.3 VAT Exemption on Capital Equipment

According to records held at the SFA, in 2015 a total of SR 4.8 million of VAT revenue was exempted on capital equipment, not including fishing vessels. A further SR 10.2 million of VAT revenue was exempted on the importation of fishing vessels.

6. THE CASE FOR REMOVAL OF SUBSIDIES

Although the demersal fishery in Seychelles is relatively small-scale, it is still made up of commercial, profit-driven individuals/businesses.

Thanks to the subsidies, the profitability of artisanal fishing has increased artificially, leading to the expansion of that sector and consequently increasing pressure on stocks of overexploited species such as red snapper. As such, the subsidies are considered harmful and are not commensurate with government policy for sustainable fisheries.

It is also believed that the subsidies have not been conducive for efficiency in the artisanal fisheries sector.

Furthermore, the subsidies have not fulfilled their objectives of keeping the price of fish affordable for domestic consumers and maintaining food security.

The next section of this Report will consider the impact on vessel operations of withdrawing the larger subsidies (concessions on fuel and ice and VAT exemptions) using the Vivid Economics² model.

The subsequent section of the Report analyses the impact of removal of the subsidies on a) profitability of boat owners and their decision to remain in traditional fishing activity b) artisanal fishermen that may be displaced from employment in fishing c) fish prices d) availability and affordability of fish to indigenous local community.

That Section will also analyse the mitigating measures which may be considered to be implemented in each case.

7. IMPACT OF WITHDRAWING SUBSIDIES ON VESSELS

The Vivid Economics model is based on data from 2013 and at the time of writing this report, no updated version was made available. Therefore, it is assumed that in a Business As Usual (BAU) scenario, the number of schooners, whalers and outboards will remain constant as will their catch effort in terms of man days.

In calculating the impacts of withdrawing subsidies on a typical vessel type based, it is imperative that the assumptions used are clearly defined.

In the calculation for 'Fixed Costs', the following are included: -

- Fishing license fees
- Repair and Maintenance costs
- Vessel cost
- Engine cost
- Insurance
- Gear costs (Hooks and lines)

In the calculation for 'Variable costs', the following costs are included:-

- Fuel
- Food
- Bait
- Ice

² Vivid Economics, *Fisheries recovery on the Mahe Plateau* Report prepared for International Sustainability Unit and Seychelles Fishing Authority, July 2015.

Table 3 - Key Statistics for Artisanal Fishery (2013)

	Whalers	Schooners	Outboards
Total Catch (MT/year)	2,140	380	1,522
Number of vessels	96	20	287
Catch per vessel (kg/per/vessel)	22,292	18,991	5,302
Number of trips per year	35	21	40
Catch per trip (kg)	644	913	133

Source: SFA

Across all three vessel types, there is little variation in the fixed costs when fishing operations are subsidised as compared to if subsidies were to be removed. This is because around half of the true cost of fishing is comprised of fuel and ice, see Figure 1, the largest proportions of the subsidies, see Table 1. However, because of subsidies, these aforementioned variables are lower today and make up around 35%, 34%, 32% for whalers, schooners and outboards respectively.

If subsidies were removed, the variable cost of fishing per day would increase by 88% for Whalers, 73% for Schooners and 89% for Outboards.

Table 4 - Costs of Fishing Without Subsidies (SR) - All Vessels

	Whalers	Schooners	Outboards
Fixed costs per vessel per year	80,728	117,755	22,662
Vessel	13,725	20,588	3,529
Engine	9,048	10,411	4,085
Fishing license	100	100	100
Maintenance and Repairs	56,389	84,583	14,500
Insurance	555	832	143
Interest Payments	911	1,240	305
Variable costs per vessel per trip	11,636	24,661	2,443
Fuel	5,950	15,000	1,617
Food	1,500	2,233	119
Bait	1,643	2,333	400
Ice	1,896	2,545	89
Gear	647	2,549	218
Number of trips per year	35	21	40
Variable costs per vessel per year	402,851	513,229	97,739
Total cost per year per vessel	483,579	630,984	120,402

Source: Vivid Economics calculations based on SFA 2013 data

Table 5 - Costs of Fishing With Subsidies (SR) – All Vessels

	Whalers	Schooners	Outboards
Fixed costs per year	78,504	114,418	22,090
Vessel	11,667	17,500	3,000
Engine	9,048	10,411	4,085
Fishing license	100	100	100
Maintenance and Repairs	56,389	84,583	14,500
Insurance	471	707	121
Interest Payments	829	1,116	283
Variable costs per trip	6,719	13,133	1,293
Fuel	1,983	5,000	539
Food	1,500	2,233	119
Bait	1,643	2,333	400
Ice	1,043	1,400	49
Gear	550	2,167	186
Number of trips per year	35	21	40
Variable costs per year	232,620	273,321	51,717
Total cost per year per vessel	311,124	387,739	73,808

Source: Vivid Economics calculation based on SFA 2013 data

An additional variable cost is the ‘crew share’ which has been assumed to be 66% of total net revenue; the balance is retained by the boat owner (who is not necessarily a fisherman except in the case of an outboard vessel where the boat owner is almost always a fisherman).

Table 6 - Net Operating Profit With Subsidies (2013)

	Whalers	Schooners	Outboards	All vessels*
Number of vessels	96	20	287	403
Catch (kg/year/vessel)	22,292	18,991	5,302	4,041,526
Revenue/kg	42	42	42	42
Total Revenue (SR/year/vessel)	936,273	797,639	222,688	169,744,092
Fixed costs (SR/year/vessel)	78,504	114,418	22,090	16,542,261
Variable costs (SR/year/vessel)	232,620	273,321	51,717	42,640,898
Crew Share (SR/year/vessel)	464,411	346,050	112,840	83,443,817
Total costs (SR/year/vessel)	775,534	733,789	186,648	142,626,976
Fixed costs/kg	4	6	4	4
Variable costs/kg	10	14	10	11
Crew Share/kg	21	18	21	21
Total costs/kg	35	38	35	36
Net Operating Profit/kg	7	4	7	6

* Figures in this column are totals for all vessels and not per vessel

Note: Crew Share is calculated on Total Revenue less Variable Costs

Source: Vivid Economics calculation based on SFA 2013 data

Table 7 Net Operating Profit Without Subsidies (2013)

	Whalers	Schooners	Outboards	All vessels*
Number of vessels	96	20	287	403
Catch (kg/per/vessel)	22,292	18,991	5,302	4,041,526
Revenue/kg	42	42	42	42
Total Revenue (SR/year/vessel)	936,273	797,639	222,688	169,744,092
Fixed costs (SR/year/vessel)	80,728	117,755	22,662	16,608,992
Variable costs (SR/year/vessel)	402,851	513,229	97,739	76,989,534
Crew Share (SR/year/vessel)	352,059	187,711	82,466	60,773,718
Total costs (SR/year/vessel)	835,638	818,695	202,867	154,372,243
Fixed costs/kg	4	6	4	4
Variable costs/kg	18	27	18	19
Crew Share/kg	16	10	16	15
Total costs/kg	38	43	38	38
Net Operating Profit/kg	4	-1	4	4

* Figures in this column are totals for all vessels and not per vessel

Note: Crew Share is calculated on Total Revenue less Variable Costs

Source: Vivid Economics calculation based on SFA 2013 data

The average revenue from artisanal fishing was estimated at 42 SR/kg in 2013.

According to the Vivid Economics model, the vessels in the fishery made on average a net operating profit of SR 6/kg in 2013, after removing the cost of crew share.³ This was in part due to the subsidies.

As per the model, the vessels in the fishery would on average have made a profit of SR 4/kg in 2013 without subsidies, again after removing the cost of crew share.

8. ANALYSIS

This section of the Report analyses the impact of removal of the subsidies on a) profitability of boat owners and their decision to remain in traditional fishing activity b) artisanal fishermen that may be displaced from employment in fishing c) fish prices d) availability and affordability of fish to indigenous local community.

This Section also analyses the mitigating measures which may be considered to be implemented in each case.

As per the analysis in the previous Section, and based on 2013 data, artisanal fishing was profitable (with subsidies) for all categories of boats (SR7/kg for whalers; SR4/kg for schooners and SR7/kg for outboards).

³ According to the Vivid Economics Report, the present value contribution of artisanal fishery (with subsidies) to the economy under business as usual constant effort over the next generation, 25 years, 2015 to 2040, would be negative, that is, minus SR 425 million.

In the event of removal of ALL subsidies factored into the model (fuel, ice, insurance, VAT on vessel and VAT on gear) the profitability would be reduced across all categories of boats (SR 4 /kg for whalers; -SR1 / kg for schooners; and SR4 / kg for outboards).

Since this study is only considering removal of fuel subsidy (which accounts for 55% of total value of the subsidies factored into the model) it is therefore estimated that removal of only the fuel subsidy would reduce the profitability of the boats to the following amounts:

Whalers: SR5.50/kg
Schooners: SR1.50/kg
Outboards: SR5.50/kg

The reason for this Study to consider only the removal of the fuel subsidy is due to the fact that removal of ALL subsidies including the ice subsidy would, as shown above, result in certain boat operations (viz. schooners) becoming unprofitable.

With regards to the ice subsidy, this Study is recommending that *the operation* of all SFA ice plants be eventually privatized although the infrastructure facilities should remain in the ownership of SFA. As such, SFA would remain responsible for all significant repairs and maintenance of the plants once their operations are privatised.

In this connection, a short feasibility study should be carried out to determine the business case for privatisation as well as the terms and conditions of the proposed lease agreements.

Based on past experience, it would appear that the viability of the ice plant operations by private sector was adversely affected by the high costs of utilities, in particular electricity, and also taking into account the fact that ice prices were tacitly capped.

This Study recommends that prior to privatisation of ice plant operations, Government / SFA should consider investing in PV solar systems for each of the ice plants so as to reduce the costs of energy. It is opportune that the Bel Ombre ice plant which is currently being fitted with a PV solar system be used as a pilot project to assess the business case of ice plants benefitting from such built in renewable energy systems.

It is only once such privatisation will have been achieved that this Study would recommend the phasing out of the current ice subsidy.

8.1 Impact on Boat Owner

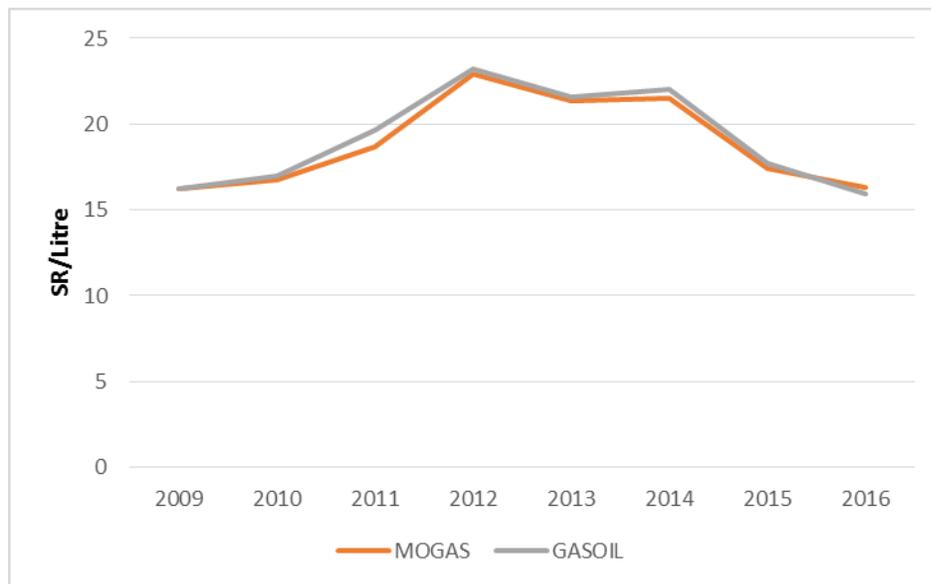
As shown in the tables above, fishing may remain profitable enough for whaler and outboard owners to continue with such activity, notwithstanding the full removal of the fuel subsidy.

However, in the case of schooner owners, the profitability would become marginal following removal of the fuel subsidy.

Since the data used in the model was for 2013 when fuel prices were still significantly higher, see Figure 4, the profit levels per kg of fish may currently be somewhat greater than those for

2013 for all categories of boats. As such, even schooner owners may find it profitable enough to continue with their artisanal fishing operations.

Figure 1 - Historical Mean Prices of Mogas and Gasoil



Source: Seypec

Moreover, some boat owners might not necessarily move out because fish stocks are still perceived as being healthy, taking into account the exceptional glut of fish on the local market in 2016.

In the scenarios in which boat owners decide to continue with their artisanal fishing operations, the removal of the subsidy would not result in any loss of jobs, and would render the artisanal fisheries sector more financially efficient. It is assumed that the least efficient boat owner operations would be the most likely to be displaced as a result of removal of the subsidies, whereas as the more efficient ones would remain in operation. Furthermore, the boat owner operations that remain are likely to explore ways and means of improving their efficiency by cutting costs and/or improving effort and diversifying catch. In particular, boat owners may be supported by SFA to venture into new fisheries of underexploited species such as deep sea crab and octopus.

In spite of the above scenarios, with the reduced level of profit that would result from total removal of the fuel subsidy, it is likely that boat owners may consider alternative and relatively more profitable activities either by selling their boat and engaging in a land based activity or using their boat for another activity perceived as more profitable such as boat charter or tourism excursions.

Some boat owners are not only involved in the fishing business and may also have other businesses, in which case they may be further incentivised to move out of artisanal fishing.

If the boat owner is close to retirement age, he may consider taking early retirement and selling his boat and investing the proceeds in a financial instrument (bank deposit; treasury bills) that would generate a steady flow of income during retirement.

Mariculture, if and when it becomes commercially operational would offer an alternative avenue for boat owners who may opt to use their boat for auxiliary services related to mariculture e.g. transportation of fish, feed and accessories to and from the farms. In terms of timelines, it is envisaged that the mariculture sector may be developed at pilot level in 2017/2018 and it is unlikely to become commercially operational before 2020.

One of the most compelling reasons for removal of the fuel subsidy is that there has been widespread abuse⁴ by certain boat owners claiming fuel refunds from SFA but not using such fuel for fishing purposes.

The fuel subsidy is operated on a refund basis and the owner is required to produce a log book of their fishing trips and receipts from the fuel station showing amount of fuel purchased. The current fuel subsidy scheme has been most difficult for SFA to monitor and to ensure that such fuel is actually used by the claiming owner's fishing boat.

Another shortcoming of the fuel subsidy scheme includes recently reported cases where boat owners are claiming the fuel refund but not passing on the benefit to their fishermen. Since crew share is calculated as $\frac{2}{3}$ of gross profit after deducting variable costs from revenue, some boat owners are deducting the total cost of fuel purchased but not fully paying the fishermen their share of the fuel subsidy once they have been refunded same.

8.2 Impact on Boat Owner / Fisherman

When the boat owner is also a fisherman (mostly in the case of outboards), this will influence his decision as to whether he will move out of the fishery, since he not only receives his share as owner but also as part of the crew. It should be noted that in the model, outboards have been assumed to comprise a crew of two fishermen.

Also assumed in the model is that the crew share is $\frac{2}{3}$ after removal of variable costs. The owner retains $\frac{1}{3}$ of gross profit.

Consequently, in a typical outboard with a crew of two, a boat owner who is also a fisherman would retain $\frac{2}{3}$ ($\frac{1}{3} + \frac{1}{3}$) of the gross profit.

Some boat owners/fishermen are also engaged in sport fishing/excursions so might already have alternative sources of income. Consequently, in the event of removal of the fuel subsidy such boat owners / fishermen may switch full time to sports fishing / excursions.

⁴ Although this claim cannot be substantiated by evidence, it is certainly the view of a number of SFA Staff as well as compliant boat owners.

8.3 Impact on Fishermen

In the case of the fishermen (who are not boat owners) their decision to find alternative employment or to retire if they are elderly enough, will largely depend on the decision of the boat owner.

If their boat owner should decide to cease the fishery activity, then such fishermen are likely to be displaced and may have to seek alternative employment.

It is however possible that the reduced remuneration (crew share) that would result from removal of the fuel subsidy, may also lead some fishermen to seek relatively more lucrative employment elsewhere, even if their boat owner should decide to continue with the fishery activity.

Alternative employment within the fisheries sector for any displaced fishermen would include the increasing number of semi-industrial vessels (currently 36 vessels employing mostly Sri Lankan crew); new fish processing plants; and the mariculture project once it becomes operational.

In the case of semi-industrial vessels, SFA together with the Seychelles Maritime Academy, could assist the owners of such vessels with appropriate training scheme linked to the recruitment of any displaced artisanal fishermen.

Nevertheless, current conditions, including the fact that boat owners are presently able to accommodate foreign fishermen onboard vessels without having to spend on onshore accommodation tend to favour continued employment of non-Seychellois fishermen. This Study recommends that the Authorities should review GOP regulations such that there be a more level playing field for employment of Seychellois vis a vis foreign fishermen. Alternatively, the Authorities may provide additional incentives to semi-industrial vessels which recruit and retain Seychellois fishermen in addition to the training scheme proposed above.

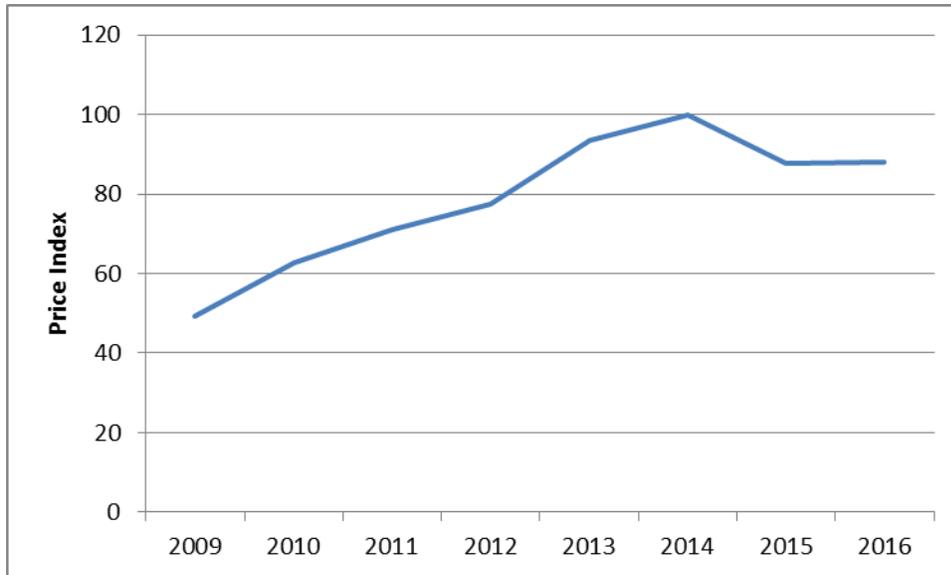
Depending on monsoon and weather, artisanal fishermen may not always be able to actively pursue their fishing activities and as such some may have alternative sources of income (e.g. back-yard farming, handymen etc...). It is recommended that a study be carried out to assess the number of fishermen (as well as boat owners) that currently engage in alternative activities with the aim of ensuring that they are channeled towards appropriate alternative employment in line with their skillsets.

The above recommended study should possibly be part of a wider study that profiles boat owners in terms of their dedicated and exclusive investment in the fisheries sector as against those with investment both in fisheries and other economic activities.

8.4 Impact on Fish Prices

The removal of fuel subsidy would tend to place renewed upward pressure on domestic fish prices, which had declined between 2014 and 2016, see Figure 5, partly due to the drop in fuel prices, see Figure 4, and partly due to the increased supply.⁵

Figure 2 - Mean Price Index of Fish 2009-2016

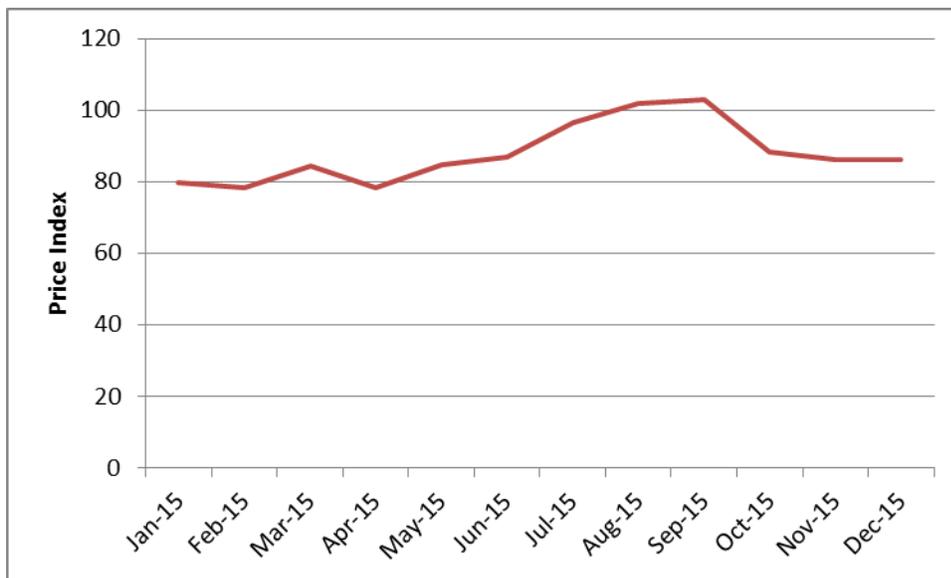


Source: Seychelles National Bureau of Statistics

⁵ The atypical excess supply of fish in 2015 - 2016 and its impact on fish prices was substantiated by interviewing a key fishmonger viz. Gilbert Rassool who also confirmed that in the case of certain demersal species such as red snapper there was an overall tendency to have smaller sizes caught.

Fish prices vary significantly between the North East Monsoon (October- April) when supply is buoyant and the South East Monsoon (May- September) when demand tends to exceed supply as shown in Figure 6 below for 2015:

Figure 3 - Monthly Price Index of Fish – 2015



Source: Seychelles National Bureau of Statistics

Notwithstanding such seasonality in catch and prices, one of the main processors / exporter (Oceana Fisheries Ltd.) are able to maintain constant prices throughout any one year due to buffer stocks made possible by cold storage facilities.

There are clear market dynamics between the export and domestic markets for certain demersal species such as red snapper. In particular, the local prices of such species are closely correlated with their export prices as well as prices sold to hotels and restaurants.

Although there are no official data for sales to hotels and restaurants, it is known that the amount of demersal fish sold to these establishments are several times more than the merchandise export of such species.

8.5 Impact on Availability and Affordability of Fish to Local Community

Due to a combination of factors (including reduced availability and affordability of fish) the indigenous local community, who traditionally had fish as their staple diet, have had to shift to cheaper sources of protein, e.g. chicken and eggs. This is further substantiated by the fact that the weight of fish in the overall consumer price index has been reduced from 3.34% (based on 2006/2007 Household Budget Survey) to 1.48% (based on 2013 HHBS).

Consequently, the proposed removal of the fuel subsidy would tend to further exacerbate the lack of availability and affordability of fish to low and middle income families, unless other measures

are implemented to increase supply to the local community or to curb demand by the export and tourism sectors.

The fish which is the most affordable to low income families are small semi-pelagic, mostly mackerel, caught by pirogues and nets and are not impacted by the fuel subsidy.

By-catch from industrial vessels is another additional source of affordable fish which is increasingly being processed and made available to the local community.

Whereas the subsidies for the fisheries sector were partly aimed at food security (and employment) for the Seychellois, this objective is not being met in the current situation and it is the tourism and the export sectors that are indirectly benefitting from the subsidies.

It may be argued that Seychelles should place a temporary embargo on exports of certain demersal species which have been identified as over-exploited. During discussions held in this connection with Mr. Charles Morin, Chief WTO Negotiator at Trade Division, Ministry of Finance, Trade and Economic Planning, it was pointed out that any such measures would have to be equally applied on the domestic market as per WTO regulations.

However, it is believed that Seychelles could still present a strong case for suspending exports of overexploited species without having to also suspend sale of such fish on the local market, taking into consideration that such fish have been traditionally part of the local source of protein. Furthermore, it may not be practical to have a complete ban on catch of such fish, given the mixed species fishery on Mahe Plateau combined with current fishing methods.

The case that the suspension of export of such fish would only be temporary, could be further substantiated by plans which are well under way to develop the mariculture sector, with emphasis precisely on the farming of the same over-exploited species of fish.

The pilot phase of the mariculture project is expected to be implemented in 2017 / 2018 although the sector is not expected to become commercially operational before 2020.

It is envisaged that once the mariculture project becomes fully operational, it will increase supply of fish for export purposes as well as to hotels and restaurants, thereby indirectly improving the availability and affordability of fish caught by artisanal fishermen to the local community.

An alternative to the proposed temporary embargo on export of over-exploited fish species would be to introduce business tax on profits of companies exporting such species. This would indirectly enable Government to recoup the direct and indirect subsidies currently benefitting the export market.

9. CONCLUSIONS AND RECOMMENDATIONS

This Study has focused on the possible removal of fuel and ice subsidies currently being granted to the artisanal fisheries sector. As per its Terms of Reference, this Study has not addressed the price at which fuel and ice should be sold to vessels in the semi-industrial fisheries sector. SFA

may consider the latter as part of a separate but not unrelated study, especially if it is decided to go ahead with the removal of fuel and/or ice subsidies to the artisanal fisheries sector.

Again, in line with its Terms of Reference, this Study limited the range of subsidies impacting on vessel dynamics to those that were used in the Vivid Economics model, i.e. fuel, ice, interest rates, insurance, VAT exemption. The model did not consider the impact of indirect subsidies e.g. quay and onshore facilities/services on vessel operations.

Since this Study aimed at the larger subsidies, the Analysis was adapted to consider the impacts of the removal of fuel and ice subsidies only.

9.1 Ice Subsidy

This Study has considered that it would not be pragmatic to totally remove the ice subsidy given that a regular and adequate supply of ice remains a major challenge for the artisanal fishing industry.

Instead, this Study recommends that a feasibility study be carried out to map out the business case for the privatisation of ice plants using the Bel Ombre ice plant as pilot project. Given that high electricity/energy costs have in the past been the main reason for ice plant operations to be unprofitable, lessons drawn from the pilot project would be useful for scaling up PV systems across the other ice plants with a view to privatizing their operations.

Government / SFA would remain responsible for all significant maintenance and repairs of the ice plants.

9.2 Fuel Subsidy

This Study has considered the three scenarios for removal of the fuel subsidy: i) Immediate Removal ii) Over 5 Years and iii) Over 10 Years.

i) Immediate Removal

This Study recommends that “Immediate Removal” should be interpreted as Removal of the Fuel Subsidy in 2018 and not in 2017 since there are strong expectations that the Fuel Subsidy will be maintained throughout 2017.

ii) Removal Over 5 Year Period (2018-2021)

In this scenario, it is recommended that the Removal of the Fuel Subsidy be phased as follows:

2017 – Subsidy of SR8 / L of Fuel Maintained

2018 – Subsidy Reduced to SR6/L

2019 – Subsidy Reduced to SR4/L

2020 – Subsidy Reduced to SR2/L

2021 – Total Removal of Subsidy

iii) Removal Over 10 Year Period

In this scenario, the Removal of the Fuel Subsidy would actually be phased over a 9-Year period as follows:

2017 – Subsidy of SR8/L of Fuel Maintained

2018 – Subsidy Reduced to SR7/L

2019 – Subsidy Reduced to SR6/L

2020 – Subsidy Reduced to SR5/L

2021 – Subsidy Reduced to SR4/L

2022 – Subsidy Reduced to SR3/L

2023 – Subsidy Reduced to SR2/L

2024 – Subsidy Reduced to SR1/L

2025 – Total Removal of Subsidy

9.3 Preferred and Recommended Scenario

This Study recommends total removal of the Fuel Subsidy in 2018; the next best scenario would be to phase the removal of the subsidy over 5 years; and the least recommended scenario would be to phase removal over the period 2017-2025.

There are both fundamental and practical reasons for such recommendations.

The fact that the Fuel Subsidy is considered a “harmful subsidy” for sustainable fishery of over-exploited demersal species, supports the recommendation for urgent action and that the fuel subsidy should be removed in its totality in 2018. Furthermore, this would coincide with the implementation of the first phase of the Demersal Fisheries Management of the Mahe Plateau.

There are other key considerations to support total removal in 2018:

- Fuel is still relatively cheap even if prices have resurged somewhat, and consequently the total removal of the fuel subsidy would be more easily absorbed by the boat owners, assuming world fuel prices and prices in Seychelles in 2018 do not significantly exceed current levels.
- Given the new political landscape, it is less likely that the removal of the fuel subsidy would be politicised, especially in view that it is widely believed that there is abuse of the subsidy by a number of boat owners who are not using the subsidised fuel for fishing purposes. Moreover, the fuel subsidy is not fulfilling its main objective of achieving an adequate and affordable supply of fish for the local community.

10. MITIGATING MEASURES

The main concern of removing fuel and ice subsidies would be a) their impact on boat owners and fishermen and b) the availability and affordability of fish by low and middle income households.

In order to mitigate such impacts, the following mitigating measures have been identified:

- i) Boat owners who should decide to cease fishing operations should be encouraged and supported to either sell their vessels (Government and SFA may use the SR 25 million per annum savings from removal of the fuel subsidy to buy back and decommission older vessels) or to find alternative use for their vessels (sports fishing; tourism excursions; auxiliary / transporting service for mariculture).
- ii) Fishermen who get displaced should be assisted by Government / SFA to either take early retirement (if close to retirement age) or to find alternative employment (training programme to join semi-industrial fishing; mariculture support activities; fish processing industries; sports fishing; tourism excursions; land-based activities e.g. agriculture; handyman depending on skillsets and disposition).
- iii) Boat owners/fishermen may be encouraged and supported to venture into new fisheries activities of underexploited species such as deep sea crab and octopus.
- iv) Temporary suspension of export of over-exploited demersal species e.g. red snapper until such time that stocks are replenished and/or the mariculture project becomes commercially operational. Alternatively, businesses engaged in exports of overexploited demersal fish should become fully liable to business tax (without concession).
- v) Fast-tracking the implementation of the mariculture pilot project in 2017 /2018 such that private sector operators may timely invest in this new activity taking into account that the commercial operationalisation of mariculture may not be realised before 2020. If and when the mariculture project become commercially operational, it would ensure increased supply of demersal species for export and for sale to hotels and restaurants.
- vi) Building upon the use and processing of by-catch from industrial fisheries since this would also help increase availability and affordability of fish for the local community.

It is being recommended that Government may use the savings from removal of the fuel subsidy (SR 25 million per annum) to finance the above mitigating measures as well as to finance solar PV systems for SFA ice plants and the implementation of the Demersal Fisheries Management Plan. Such policy action would be totally in line with Seychelles' marine biodiversity conservation strategy, and more specifically the promotion of sustainable fisheries.

Appendix 1 – Breakdown of Fishing Costs (with and without subsidies) per Vessel Type

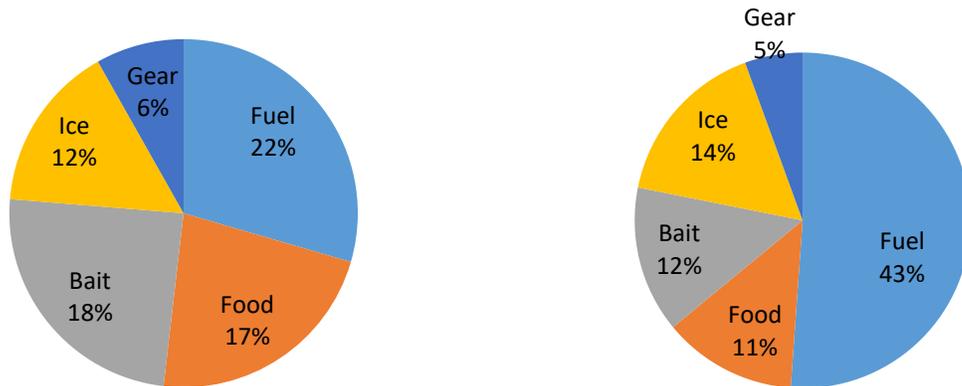
WHALERS

Table 8 - Costs of Fishing With and Without Subsidies (SR) - Whalers

	With subsidies	Without subsidies
Fixed costs per year	114,418	117,755
Vessel	17,500	20,588
Engine	10,411	10,411
Fishing license	100	100
Maintenance and Repairs	84,583	84,583
Insurance	707	832
Interest Payments	1,116	1,240
Variable costs per trip	13,133	24,661
Fuel	5,000	15,000
Food	2,233	2,233
Bait	2,333	2,333
Ice	1,400	2,545
Gear	2,167	2,549
Number of trips per year	21	21
Variable costs per year	273,321	513,229
Total cost per year	387,739	630,984

Source: Vivid Economics calculation based on SFA 2013 data

Figure 4 - Whaler Costs with (left) and without (right) subsidies



Source: Vivid Economics calculation based on SFA 2013 data

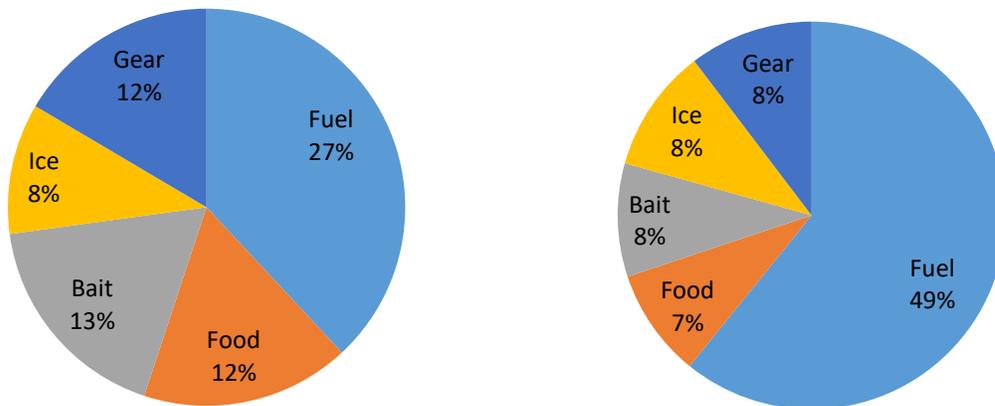
SCHOONERS

Table 9 - Costs of Fishing With and Without Subsidies (SR) - Schooners

	With subsidies	Without subsidies
Fixed costs per year	78,504	80,728
Vessel	11,667	13,725
Engine	9,048	9,048
Fishing license	100	100
Maintenance and Repairs	56,389	56,389
Insurance	471	555
Interest Payments	829	911
Variable costs per trip	6,719	11,636
Fuel	1,983	5,950
Food	1,500	1,500
Bait	1,643	1,643
Ice	1,043	1,896
Gear	550	647
Number of trips per year	35	35
Variable costs per year	232,620	402,851
Total cost per year	311,124	483,579

Source: Vivid Economics calculation based on SFA 2013 data

Figure 5 - Schooner Costs with (left) and without (right) subsidies



Source: Vivid Economics calculation based on SFA 2013 data

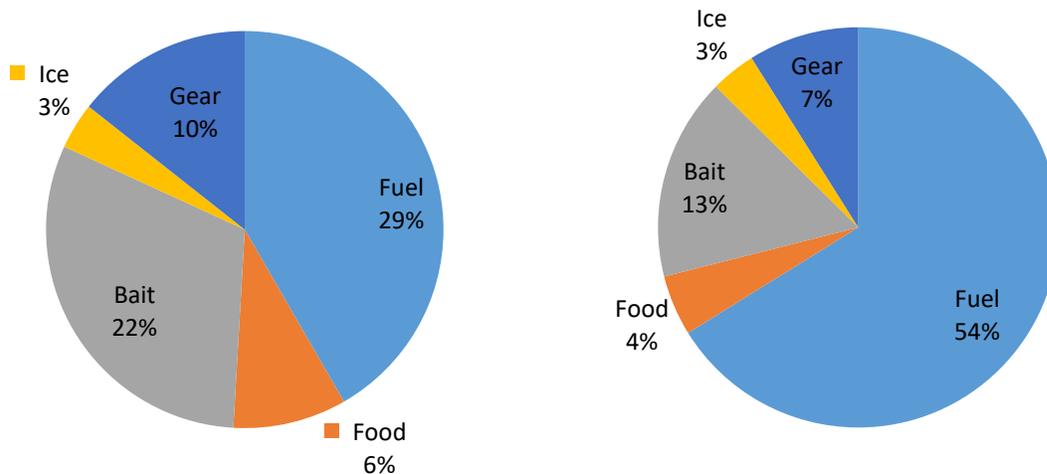
OUTBOARDS

Table 10 - Costs of Fishing With and Without Subsidies (SR) - Outboards

	With subsidies	Without subsidies
Fixed costs per year	22,090	22,662
Vessel	3,000	3,529
Engine	4,085	4,085
Fishing license	100	100
Maintenance and Repairs	14,500	14,500
Insurance	121	143
Interest Payments	283	305
Variable costs per trip	1,293	2,443
Fuel	539	1,617
Food	119	119
Bait	400	400
Ice	49	89
Gear	186	218
Number of trips per year	40	40
Variable costs per year	51,717	97,739
Total cost per year	73,807	120,401

Source: Vivid Economics calculation based on SFA 2013 data

Figure 6 - Outboard Costs with (left) and without (right) subsidies



Source: Vivid Economics calculation based on SFA 2013 data