

Inventory of the Fishery sector of St. Eustatius

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Background

From 10 to 18 February 2004 a short inventory of the fishery sector of St. Eustatius was carried out in order to get an insight of the total catch, total fishing effort and catch composition.

The collected data will be used to define indicators which values will be used as points of reference to formulate the National fishery policy. On this manner sustainable management and exploitation can be realized of the territorial waters of St. Eustatius and the adjacent waters of the Economical Fishery Zone (EFZ) of the Windward Islands of the Netherlands Antilles. Furthermore the Local and Central Governments will get a better view of fishery sector as a whole, concerning the economical importance of the fishery sector, the number of people employed in the sector, the savings of foreign currency and the income from taxes. A inventory system was prepared by Mr. Paul Hoetjes from the Environmental Division of the Ministry of Public Health and Social Development and Mr. Faisal Dilrosun from the Fisheries Division of the Department of Agriculture, Animal Husbandry and Fisheries of the Island Territory of Curaçao. Local assistance was provided by the St. Eustatius National Park Foundation.

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Summary

There are about 25 fishermen on the island of St. Eustatius. Considering the small scale island economy this is a significant social economical factor that can not be overseen by the local Island Government. The money that is generated by the fishery sector, directly and indirectly, is invested back into the St. Eustatius economy, since all the fishermen are locals. In addition indirect taxes are generated from fuel, two stroke oil, fishing gear, spare parts and engines. The aggregated value of the fishery sector is also an important factor to the island economy. The spiny lobster (*Panulirus argus*) fishery is without doubt the most important fishery on the island. The total lobster catch for 2003 is estimated to be approximately 4 tons, which represents a gross value of 100,000 NAf.

The St. Eustatius fishermen primarily fish on the narrow shelf surrounding the island. In 1996 the Island Council of St. Eustatius approved the Marine Park Ordinance 1996, creating a marine park and setting out regulations (diving, fishing etc.) for this marine park. Subsequently the St. Eustatius National Park Foundation (STENAPA) was requested to manage the park and active management started in 1997. STENAPA therefore has the effective control over the island shelf from the high water mark to the 30 meter (100 ft) depth contour. In addition 2 marine park reserves were put in place to be managed by the STENAPA foundation, where fishing is restricted to hand line fishing. Furthermore the fishermen were restricted to catching a maximum of 20 queen conch (*Strombus gigas*) per year in the marine park area, without any base line study had taken place. The St. Eustatius fishermen find that the best fishing grounds were designated to be marine reserves, and after several quite severe incidents that took place over the years between them and STENAPA fishers have become distrustful of the local Island Government's actions and STENAPA. In addition it is the fishermen's experience that catches have gone down significantly since STENAPA took over management of the park area. An other factor that has even worsened the situation is that tankers, coming and going to the St. Eustatius oil terminal, are anchoring in the marine park area (within the 30 meter depth contour), and are destroying the fishing grounds with their anchor and anchor chain, and cutting away the traps. The fishermen find that the habitat destruction by the oil tankers is much more severe than their "relatively small" violations of the marine park ordinance. Since the management of the marine park and thus the fishing grounds is a STENAPA matter, a critical success factor for sustainable management of the park area, and consequently the fishing grounds, is improving the communication and cooperation between the STENAPA foundation, the fishermen and local island Government, and finding a solution for the anchoring problem.

1. Stakeholder analysis

Since the Atlantic coast of St. Eustatius is fairly rough and only the Southwestern coast is easily accessible to ship traffic, conflicts of interests of the different stakeholders are inevitable. The following table gives an overview of the different stakeholders in de fishery sector and their role in the fishery. In the following chapters the roles of the most important stakeholders will become more evident, with regard to their impact on the fishery sector.

Role of stakeholder:	Stakeholders:
Primary	trap fishermen beach seine fishermen (2X) trolling Fishermen hand line fishermen illegal spear fishermen illegal conch fishermen (1X)
Supporting	middlemen (1X) boat owners consumers (incl. restaurants./hotels) exporters/Importers boat builders sale of fishing gear boat mechanics dock transport, taking boats in- and out of the water importers of inputs (fishing gear/Fiberglass/Engines) Department of Agriculture, Animal Husbandry & Fisheries St. Eustatius (LVV) Koninklijke Nederlandse Reddings Maatschappij (KNMR) Development Bank of the Netherlands Antilles (OBNA)
Controlling	Coastguard of the Netherlands Antilles & Aruba Harbor office STENAPA foundation Police Corps of the Netherlands Antilles
other resource users/stakeholders coastal zone	St. Eustatius Tourism Development Foundation Dive Statia, Golden Rock & Scubaqua Dive Centers yachts, supply boats, dive liveaboard (Caribbean Explorer) St. Eustatius Oil Terminal
policy makers	Ministry of Public Health & Environment, Environmental Division STENAPA foundation Central Government fishery committee, Ministry of Economical Affairs Central Bureau for Juridical and General Affairs (CBJAZ)

2. Problem areas

The second step included the identification of the problem areas of the St. Eustatius fishery sector. During a meeting with STENAPA and the Fishermen on 10 February 2004, and as result of several interviews with fishermen the following problem areas were identified:

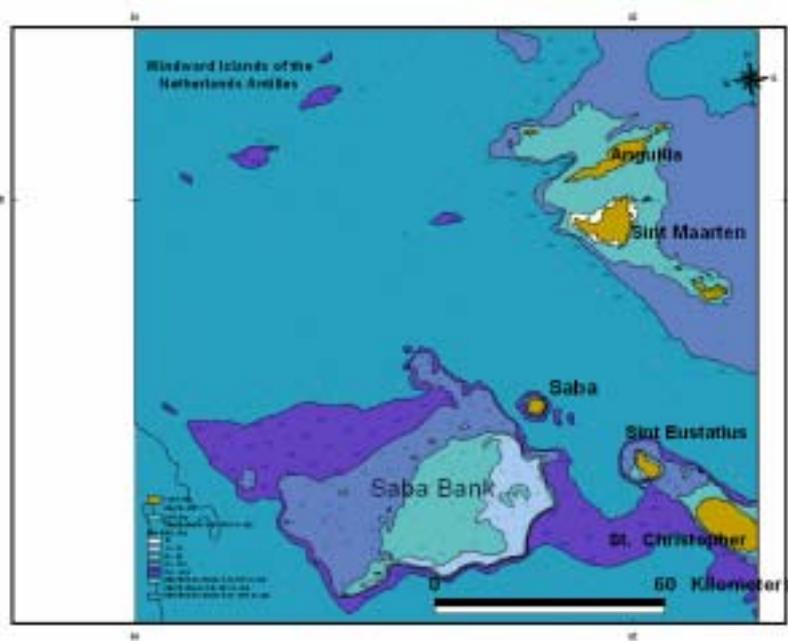
- Anchoring of oil tankers going to the St. Eustatius Oil Terminal damaging the underwater biodiversity and fishing grounds and cutting away the fish traps. These traps continue to catch fish and become “ghost traps”;
- Passing sail boats, tankers and other boats are cutting away the fish traps;
- The fishermen accuse the dive shops that they cut off the lobster and fish traps and close off the entrance funnel
- Poor on-shore facilities such as a the facilities for lifting the boats out of the water in case of emergency, and no special landing areas for the fishermen;
- The St. Eustatius Fishermen mistrust STENAPA.
STENAPA was founded in 1995 and in 1996 all the waters surrounding St. Eustatius were declared nature park areas (up till 30 meters depth contour) (Figure I). Within this area 2 marine reserves were created, the Southern reserve and the Northern reserve, where fishing is restricted to hand line fishing. The fishermen are allowed to fish in the Marine Park area, but no traps can be set in the park reserves. The St. Eustatius fishermen find that the best fishing grounds were designated to STENAPA, and after several quite severe incidents that took place over the years between them and STENAPA have become distrustful of the local Island Government’s actions and STENAPA.
- The St. Eustatius fishermen find that the marine reserve boundaries are poorly defined and that it is unclear to them where they are and are not allowed to set their gear around the marine reserve;
- *Ciguatera*
One big limiting factor in developing the St. Eustatius fishing sector is the local experience that some fish from certain areas are poisonous (Ciguatera fish poison). Ciguatera is a nerve poison that originates from a micro algae (dinoflagellate) which builds up thru the food chain.
The consumption of large predatory demersal fish such as barracuda, large jacks, etc. is locally being avoided;
- Violation of the Marine Park Ordinance and other environmental legislation by the fishermen:
 - i. setting lobster traps in the park reserves;
 - ii. catching more than 20 conch per year per fishermen;
 - iii. spear fishing in the Marine Park area and in the park reserves.Regretfully the local police corps can only undertake action, and come on the STENAPA boat if their schedule allows this.

Actions that are being undertaken to deal with the above mentioned problems:

- From 1998 STENAPA and the Statia Oil Terminal have discussed the possibility to install a number of mooring buoys for the oil tankers to prevent them from anchoring

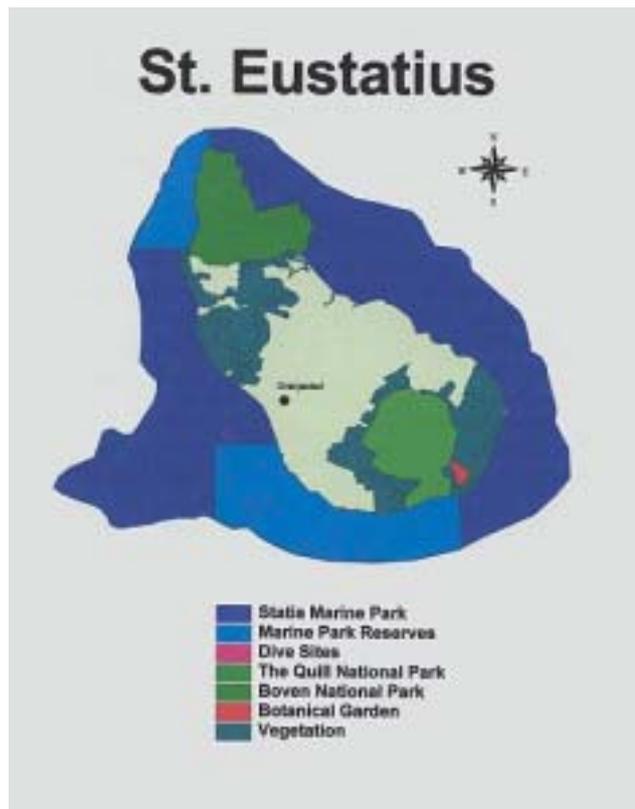
in the Marine Park. The idée was that a percentage of the mooring fee would be transferred to STENAPA for environmental conservation;

- Before the marine park was founded there were 3 commercial anchoring zones in place for oil tankers. Two of these zones lay into the marine park and one partly outside the park area (Figure II). Regretfully the tankers are structurally anchoring outside these anchoring zones and subsequently into the marine park and on the fishing grounds. STENAPA is looking into the possibility to collect anchoring fees for the tankers that anchor within the marine park area.
- STENAPA is currently working on setting a number of marking buoys so that the marine reserves boundaries are better visible for fishermen, along with a information campaign.
- STENAPA would like to have a representative of the fishermen on their board.
- The Coast Guard of the Netherlands Antilles will be contacted by the Environmental Division of the Ministry of Public Health and Environment to deal with the violations of environmental legislation;



NORTHERN RESERVE

Jenkins Bay, 17°30.5' coordinate along the high water line to its most northern point of the island, to the north to the 30 meter depth limit, to the west and south along the 30 meter depth limit until these lines pass the coordinate 17°30.5'



SOUTHERN RESERVE

From Gallows Bay, 17°28.5'N coordinate along the high waterline to the point White Wall, south outward in the sea for ½ nautical mile, to the west following the 30 meters depth limit or ½ nautical mile outward in the sea, measured from the coastline to the crossing with the 17°27.7'N coordinate, to the north 17°28.5'N coordinate and back to Gallows Bay.

3. The Fishery

3.1 On Shore facilities

In Gallows Bay St. Eustatius there is one facility for lifting the fishing vessels out of the water (Figure III.) for maintenance or in case of emergency. Unfortunately the facility has never worked optimally and is currently out of order, because there is no money or no effort being undertaken to buy the necessary cables and mechanical winch.

There is no pier in the harbor where the fishermen can tie their boat and subsequently most of the boats are moored outside of the harbor in open, un-protected water.

The fish market located in Gallows Bay is quite good and would almost meet the EU standards, would it not be for the fact that most of the infrastructure in the market is dysfunctional. The infrastructure includes:

- one saw machine (all rusty and dysfunctional)
- 2 walk-in freezers (dysfunctional)
- 1 flake ice machine (dysfunctional)
- 2 toilets
- fresh water (cistern water and/or deep well with brackish water)
- electricity
- 2 different types of scales
- 1 fish processing table
- 1 home freezer (dysfunctional)
- tiled floor

3.2 Market info

Local fish, lobster and queen conch is relatively scarce on the island. The great majority of the local catch is being exported to St. Maarten, which takes place every Wednesday. The table below gives an overview of the local fish prices per target species in St. Eustatius.

	Price per kilo (Naf)
Spiny lobster (<i>Panulirus argus</i>)	25.00
Red snapper species	16.00
Conch (<i>Strombus gigas</i>)	20.00
Pot fish	10.00
Wahoo (<i>Acanthocybium solandri</i>)	16.00
Dolphin (<i>Coryphaena hippurus</i>)	16.00
Tuna	16.00
Little jack (<i>Selar crumenophthalmus</i>)	10.00

Table I. Fish prices per target species on St. Eustatius

3.3 Fishing effort: boats and gear

The St. Eustatius fishing boats are all small open wooden hull fishing boats covered by fiber glass and are propelled by 1 or 2 two stroke gasoline engines. Some are constructed locally, but most are built in St. Kitts. There are 15 of these fishing vessels on St. Eustatius. All vessels are moored at Gallows Bay, the only landing site on the island. Most of the fishermen are part-time fishermen, since almost all of them have a on-shore fixed job. Only 3 of the fishermen can be considered professional fishermen, since they have no additional income. There are about 24 fishermen on the island of which 3 can be considered professional fishermen.

The lobster fishery is without doubt the most important fishery on the island. The lobster trap is consequently the most common fishing gear on the island. Each fisherman has about 15-20 lobster traps. The lobster traps are constructed of uncoated chicken wire ($\varnothing=1.5''$), which are reinforced with wooden sticks. The fishermen prefer a smaller diameter for fish traps for which they prefer uncoated chicken wire of 1.25'' diameter. Traps that are set on the rough Atlantic east side of the island are sometimes reinforced with an iron frame. The traps are all of the Antillean chevron (arrow shaped) type and are 3 ft in length. The traps are hauled manually; only 3 boats are equipped with a mechanical winch. Depending of the weather, sea condition and season, the traps are hauled 2 times a week. The bait for the lobster traps consists of cow skin either imported from St. Kitts or local, local goat skin and/or goat carcasses or local wild fowl and/or fish (by catch from the lobster traps). One quite exceptional observation was the relatively short time of a fishing trip in St. Eustatius, which varied between 2 and 4.5 hours, much shorter than the duration of the average fishing trips on all other islands of the Netherlands Antilles, which can be partly explained by the fact that the fishing grounds are relatively close to the landing zone. In contrast to the lobster fishery of the Saba Bank the lobster fishery of St. Eustatius is a seasonal activity, which starts in September and ends in April. As the lobster season ends the fishermen shift to targeting fish, primarily by using fish traps. The preferred bait for the fish traps is chicken skin and/or wild fowl and fish (from the by catch).

There are 2 beach seines on the island, but in recent years the beach seines were not used. The fishermen state that the fishing ground where they used to set the beach seine has been transformed by recent hurricane activity and is nowadays covered by rocks and coral rubble,

which destroy the nets. The season for the “little jack” (*Selar crumenophthalmus*) is in June and July during the last quarter till new moon.

Some hand lining and trolling is done, mostly by part-time fishermen in the weekends. The STENAPA foundation also reports that illegal spear fishing is still being practiced in the marine park area and in the park reserves.

One fisherman openly admits to being conch fishermen. Scuba gear is used by him to dive for conch and he will also occasionally take lobsters. As mentioned above a St. Eustatius fisherman is only allowed to land 20 conch per year from the marine park area (Marine Park Ordinance, 1996). However if the conch is taken below 30 meters the marine park ordinance is not applicable, and the catch would be legal.

Date:	02-11-04	02-12-04	02-13-04	02-16-04	02-17-04	02-18-04
# boats out:	3	4	6	3	2	4

Table II. Number of fishing vessels that were observed fishing from Gallows Bay, St. Eustatius from 02-11-04 to 02-17-04.

3.4 Catch and Catch Composition

The main exporter of lobsters of St. Eustatius provided a list with the weekly exports to St. Maarten during the lobster season. It is his calculation that he buys approximately 50% of the total lobster catch of the St. Eustatius fishermen. Additionally he stated that 2003 was an exceptionally bad year. The total lobster catch will be approximately 4 tons per year.

Date	Fisher	Amount (kg)	Total (kg)
01/08/03	RB	62.5	62.5
01/15/03	RB	60.0	122.5
01/15/03	CM	17.5	140.0
01/15/03	MS	39.0	179.0
01/22/03	MS	27.0	206.0
01/22/03	RB	34.5	240.5
02/05-03	RB	66.0	306.5
02/05/03	CM	17.0	323.5
02/05/03	NR	20.0	343.5
02/05/03	MS	59.0	402.5
02/05/03	BM	49.0	451.5
03/05/03	CM	4.0	455.5
03/05/03	RB	3.0	458.5
03/05/03	NR	30.0	488.5
03/12/03	MR	12.0	500.5
03/12/03	NR	18.0	518.5
03/12/03	CM	6.0	524.5
03/12/03	RB	2.0	526.5
03/12/03	SJ	9.5	536.0
03/19/03	MS	42.5	578.5
10/16/03	RB	25.0	603.5
10/16/03	ME	6.5	610.0
10/23/03	RB	117.0	727.0

10/23/03	RM	35.0	762.0
10/23/03	MR	19.0	781.0
10/23/03	MS	8.5	789.5
10/23/03	EW	15.0	804.5
10/30/03	RB	28.0	832.5
11/05/03	RB	46.0	878.5
11/05/03	NR	19.0	897.5
11/05/03	JF	30.5	928.0
11/12/03	RB	22.0	950.0
11/12/03	RM	102.5	1052.5
11/19/03	JF	66.0	1118.5
11/19/03	RB	29.0	1147.5
11/19/03	RM	46.0	1193.5
11/26/03	RB	49.0	1242.5
11/26/03	MS	16.0	1258.5
12/03/03	RB	32.0	1290.5
12/03/03	CM	48.5	1339.0
12/03/03	MR	14.5	1353.5
12/03/03	MS	39.5	1393.0
12/03/03	NR	44.0	1437.0
12/10/03	MS	9.0	1446.0
12/10/03	RB	64.0	1510.0
12/10/03	CM	10.0	1520.0
12/17/03	CM	74.5	1594.5
12/17/03	RB	68.0	1662.5
12/17/03	MS	61.0	1723.5
12/23/03	RB	10.5	1734.0
12/23/03	CM	48.0	1782.0
12/23/03	MS	55.0	1837.0
12/30/03	RB	18.0	1855.0
12/30/03	CM	29.0	1884.0
12/30/03	MR	14.0	1898.0
Total:			1,898.0

Table III. Registered lobster catch per month per fishermen in 2003.

Date	Fisher	Amount (kg)	Total (kg)
01/07/04	MS	25.0	25.0
01/07/04	RB	29.0	54.0
01/07/04	ME	15.0	69.0
01/07/04	MS	101.5	170.5
01-14-04	RB	45.5	216.0
01-14-04	CM	60.5	276.5
01-14-04	MR	12.5	289.0
01-14-04	MS	99.0	388.0
01-14-04	ME	13.0	401.0
01-21-04	RB	73.0	474.0

01-21-04	CM	78.5	552.5
01-21-04	MS	120.0	672.5
01/28/04	RB	68.5	741.0
01/28/04	CM	59.5	800.5
01/28/04	MS	80.0	880.5
01/28/04	SJ	15.5	896.0
01/28/04	ME	27.0	923.0
02/04/04	RB	39.0	962.0
02/04/04	CM	56.0	1,018.0
02/04/04	MS	56.0	1,074.0
02/04/04	ME	7.0	1,081.0
02/04/04	SJ	32.5	1,113.5
02/04/04	LH	15.0	1,128.5
02/04/04	RM	24.0	1,152.5
02/11/04	RB	15.0	1,167.5
02/11/04	SJ	20.0	1,187.5

Table IV. Registered lobster catch per month per fishermen in 2004.

One factor that was seriously hampering carrying out the catch assessment survey was the distrust of the St. Eustatius fishermen towards STENAPA, the local Island Government and Central Government. The fishermen find they have lost their prime fishing grounds to the marine park reserves, whereas the local Island Government did nothing to protect their interests. Furthermore the fishermen are of the opinion that the collected data will be used for other purposes like taxation. Nevertheless some catches were inventoried and some of the fishermen even let their catches be weighted and measured.

One thing that was striking was that the catch per trap was relatively high, resulting in a relatively high catch per unit of effort (CPUE).

Date:	Lobster catch (kg):	Number of trap days: (# traps x soak time)	CPUE (kg/trapday):
02/11/04	8.0	30	0.267
02/11/04	15.0	91	0.165
02/12/04	23.0	98	0.235
02/13/04	10.0	28	0.357
02/16/04	13.0	28	0.036
02/18/04	2.0	24	0.098
Total:			

Table V. Lobster catch, number of trapdays and catch per unit of effort in kilogram per trapday.

Biological Data

Since the cooperation of St. Eustatius fishermen was not as was anticipated beforehand, only a limited number of spiny lobsters (*Panulirus argus*) were measured (carapace length). Other biological data that were included in the survey were: sex ratio, berried lobsters and molting lobsters. The following table gives an overview of average carapace length of the lobsters measured, the sex ratio and the number of berried lobsters in the samples.

	2/11/2004		2/12/2004	
	Male	Female	Male	Female
	11.4	9.5	11.9	10.9
	10.5	8.6	12.2	12.3
	12.2	11.2	11.9	8.3
	10.5	10.1	8.7	9.2
	9.0	12.3	10.5	10.9
	10.2	11.3	10.2	10.7
	11.2	10.1	14.3	10.4
	10.2	10.1	9.6	9.8
	9.5	10.3	8.4	
		10.7	9.6	
			10.2	
			9.3	
			10.3	
			11.2	
			8.9	
			10.6	
n=	9	10	16	8
CL(avg)=	11.5	11.4	11.5	11.3

Table VI. Carapace length of male and female spiny lobsters (*Panulirus argus*), measured during the rapid survey from February 10 to February 18, 2004.

Conclusions and recommendations

3.1 Conclusions

First of all it must be stated that the St. Eustatius artisanal fishermen over the years have been little innovative and have shown little effort to improve their fishing business. The boats are even for the standards of a artisanal fishery very small as is the number of gear. Artisanal fishermen in other islands of the Netherlands Antilles (Curacao, Bonaire and Saba) have anticipated on the growing market and demand for fisheries products and have improved their boats and fishing gear. The St. Eustatius fishermen show great respect for the fishermen of the neighboring island of Saba, but have in no way copied their development, innovations, improvements and fishing effort. It is a fact that the Saba Bank is closer to Saba than it is to St. Eustatius, and that the small open boats of the St. Eustatius fishermen would have great difficulty getting to the Bank and coming back against the prevalent direction of current and waves. It has to be stated however that fishermen in other islands of the Netherlands Antilles i.e. Curaçao have to run even further distances to reach their main fishing grounds. A bigger type of boat would be necessary for the St. Eustatius fishermen to go fish the Saba Bank and they are well aware of this fact, but over the years no fishermen has shown any effort to improve his fishing business.

The CPUE's inventoried during this visit were exceptionally high and some even higher than the comparable lobster fishery on the prime fishing grounds of the Saba Bank (no definitive conclusions can be drawn from these CPUE's because catches can fluctuate during the year, they do however provide a rough frame of reference). Catches can not increase while fishermen don't increase their fishing effort. The fishing effort of the fishermen in St.

Eustatius is by far the lowest fishing effort observed in all islands of the Netherlands Antilles. The St. Eustatius fishermen however blame the relatively low catches on third parties (STENAPA, dive shops, Government etc.). In addition it has to be mentioned that the St. Eustatius fishermen were the only fishermen in the Netherlands Antilles that demanded financial compensation to provide fisheries data.

The ad random anchoring in and passing thru the fishing grounds of oil tankers is without doubt a serious problem for the local fishery sector. Furthermore ad random anchoring poses serious harm to the underwater biodiversity, since it is a mayor underwater habitat destructor. STENAPA is currently working on the possibility to collect anchoring fees from the tankers. A big risk factor is that tankers will go and anchor elsewhere i.e. the Saba Bank.

The relationship between the STENAPA foundation and the fishermen is closely connected to one and another, since most of the fishing is being done within the 30 meter depth isobath, and therefore falls into the marine park area. Apart from managing and making the policy in the marine park area the STENAPA foundation is the one that enforces the park regulations. This construction leads logically to a tense relation between them and the fishermen. According to the STENAPA foundation action is being undertaken by the local police corps in case a violation has been called in, depending on availability. The input of the Fisheries Division of the local Department of Agriculture, Animal Husbandry and Fisheries is unclear.

Additional fishery legislation could be of benefit to the fishery in order to make it “more” sustainable. Fishing licenses could regulate the number of gear and thus total fishing effort, legal mesh sizes for traps, biodegradable panels in the traps, regulate the number of conch fishermen and legal size limits for conch outside of the park area.

3.2 Recommendations

A more proactive Department of Agriculture, Animal Husbandry and Fisheries could bring the infrastructure and facilities for the fishery sector up to date. They could make a start by bringing the fish market up to EU standards, taking into consideration that the Netherlands Antilles was put on list No 1 for countries that may export fish products to the EU, and consequently can expect EU inspections in the near future. Financial means can maybe be made available from the Island Governments (LVV) budget.

Regulating the anchoring of oil tankers and giving routing directives to passing ship traffic could bring down the problem to acceptable levels. The local Island Government and Harbor office could play a mayor role in dealing with this problem.

It is recommended to put a stop to spear fishing in the marine reserves and marine park areas, since it has been scientifically proven to be a mayor cause of over-fishing. It is recommended to have a representative from the police corps in the next fishery meeting.

It is recommended for the local Executive Council appoint a independent body (speciale agent van politie) to deal with violations of the marine park ordinance.

The fishermen accuse the dive shops that they cut off the lobster and fish traps and close off the entrance funnels. There are only 3 dive shops on the island and it has to be made clear to them that tampering with other people properties is an offence. If they don't want their customers to see entrapped fish, they should take their divers to one of the two marine reserves, since no trap fishing is allowed there. If they encounter traps within the reserves they should report this to the responsible authority.