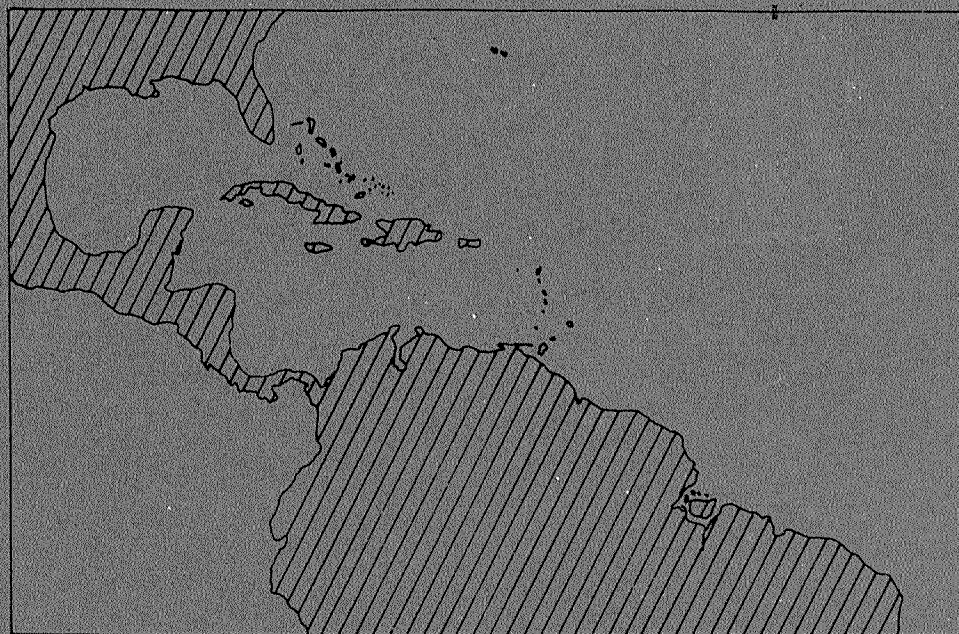


INTERREGIONAL FISHERIES DEVELOPMENT AND MANAGEMENT PROGRAMME
(WECAF Component)

**PROGRAMME FOR FISHERIES DEVELOPMENT
AND DIVERSIFICATION IN THE
SOUTHERN NETHERLANDS ANTILLES:
ARUBA, CURACAO AND BONAIRE**



UNITED NATIONS DEVELOPMENT PROGRAMME



FOOD AND AGRICULTURE ORGANIZATION OF
THE UNITED NATIONS

Interregional Fisheries Development and Management Programme
(WECAF Component)

Programme for Fisheries Development
and Diversification in the Southern Netherlands Antilles:
Aruba, Curaçao and Bonaire

by

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INTERREGIONAL FISHERIES DEVELOPMENT AND MANAGEMENT PROGRAMME

The Interregional Fisheries Development and Management Programme began its activities on 1 January 1980. It has three components (Headquarters, CECAF and WECAF) and the WECAF component is the successor of the Interregional Project for the Development of Fisheries in the Western Central Atlantic (WECAF) which was initiated in March 1975 and terminated its second phase on 31 December 1979. Its objectives are to assist developing coastal countries in assessing development opportunities offered by their available fishery resources and to formulate appropriate actions, to promote the rational utilization of fishery resources, to promote the development of technical and economic cooperation among countries of the region and to assist in the upgrading of their human resources. Its activities are coordinated by the Western Central Atlantic Fishery Commission (WECAFC) established by FAO in 1973. The Project is supported by the United Nations Development Programme (UNDP) and the Food and Agriculture Organization of the United Nations (FAO) as the Executing Agency.

As with the previous project, two series of documents will be prepared to provide information on activities and/or studies carried out. This document is the thirty second of the series WECAF Reports. The other series of documents is entitled WECAF Studies.

D.A. Lintern
Acting Project Director

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1. Introduction

Fisheries in the southern Netherlands Antilles are purely artisanal activities essentially based on trolling and hand line operations concentrated in the inshore waters around the islands. These fisheries are far from satisfying the local demand for sea products. During recent years they produced about 1 800 t of fish a year, whereas importations of fish and fish products reached a superior amount, approximately 2 000 t a year.

This situation, however, can be improved by a better exploitation of the existing fishery potential. This was understood by the Central Government of the three islands as well as by each individual Government. In effect, these bodies started establishing a small-scale fisheries development plan by the beginning of 1979. This programme began with the introduction of 28 ft fibreglass boats in Bonaire and envisaged the exploitation of the distant waters of the EEZ at a more distant date.

In the meantime, the Netherlands Antilles became a WECAF member country and requested the assistance of the Project for the technical evaluation and eventual re-structuration of the original programme. This task was carried out during several missions in the field, in May, October, November and December 1979, and resulted in the present programme.

2. Background

The southern Netherlands Antilles, Aruba, Curaçao and Bonaire, can be characterized by the following features as regards fisheries exploitation and development possibilities:

- (a) the absence of important land sources for animal protein and thus a great dependence on the sea for this supply;
- (b) the insufficient development of the fishery sector and, thus, the obligation to import about 2 000 t of fishery products per year;
- (c) a geographical location in one of the most productive areas of the Caribbean Sea as regards small, medium and large migratory pelagics and the existence of these species all year round in various densities according to season;
- (d) steep continental slopes in Curaçao and Bonaire and, thus, the existence of a limited demersal stock around these two islands;
- (e) a different environmental situation in Aruba which, by its location on the South American continental shelf, has a sea floor surface of 2 630 km² in the 50 to 200 m interval and thus has better access to demersal resources;
- (f) a local small-scale fishery which, in spite of its lack of development, is an active and dynamic force producing about 1 800 t of fish a year;

- (g) a rather high technical level of the fishermen and associated artisans, boatbuilders and mechanics, within the limits of the techniques they are actually using;
- (h) the increasing interest of the working force to enter into fishing activities;
- (i) the willingness of the Governments to put a strong emphasis on fisheries development in order to strengthen their economy, create new employment opportunities, improve protein supplies and elevate the status of the fishermen.

3. Justification

The previous conditions are favourable factors for fisheries development and it is believed that the number of fishermen, production and productivity could be substantially increased by an effort with the following objectives.

4. Objectives

This effort should be based on a development programme whose objectives would be to show the possibility for the development of fishery production and productivity in the Netherlands Antilles, to initiate this development when possible and to indicate the technical and financial requirements for its rapid strengthening in the future. To attain these objectives emphasis should be focused in the following areas:

- (a) improvement, diversification, increase and geographical extension of the artisanal exploitation of the medium and large size pelagic fish potential for the three islands;
- (b) improvement of the artisanal exploitation of the continental drop-off demersal resources in the 100 to 300 m interval for the three islands;
- (c) improvement, diversification and increase of the artisanal exploitation of the demersal and pelagic fish potential of Aruba's continental shelf in the 50 to 200 m interval;
- (d) introduction of artisanal exploitation of the demersal species of the continental slopes' upper margins, the 300 to 500 m interval, in the three islands.

5. Development Programmes

(a) Production Techniques

At the present time the basic production technique in the Netherlands Antilles is surface and near-surface trolling for medium and large size pelagic fishes in the near shore deep-waters surrounding the three islands. Some surface and bottom handlining is also carried out, mainly along the continental drop-off. Some fish trapping also exists, mainly in Aruba. Other techniques such as gill-netting and beach-seining are seldom used.

The typical boats used are 4 to 10 m wooden units, well built and with inboard or outboard engines. Sail power still exists. The fishermen are skilled within the limits of their techniques and display good seamanship. The existing catching techniques are adequate but obviously are not taking advantage of all the production possibilities offered by the existing potential.

During the development programme the following new techniques are to be tested for productivity and immediately introduced if the results are positive:

(1) Aruba Continental Shelf (50 to 200 m interval)

- (i) Gill nets for medium and small-size pelagic or semi-pelagic species, anchored, towed or drifting, at the surface or in mid-water, with or without light and/or chumming attraction.
- (ii) Gill nets for all sizes of demersal species, anchored, towed or drifting on the sea-floor.
- (iii) Horizontal longlines for demersal and semi-pelagic species, anchored on the sea-floor or in mid-water.
- (iv) Horizontal longlines for big size shark, anchored in mid-water.
- (v) Vertical longlines for demersal and semi-pelagic species, anchored on the sea-floor or drifting.
- (vi) Multiple surface, sub-surface and near-floor trolling for all sizes of pelagic and semi-pelagic species, with or without anchored rafts for attraction and concentration, and for all sizes of demersal species.
- (vii) Multiple jigging handlines for medium and small-size pelagic and semi-pelagic species, with or without light and/or chumming attraction.
- (viii) Danish-style demersal seining for shrimp and all demersal fish species.

(2) Continental Shelf Drop-off, for the Three Islands (100 to 300 m interval)

The same techniques as in (i), (iii), (iv), (v), (vi) and (vii) and also:

- (ix) Multiple sea-floor handlines with manual reels.
- (x) Wire fish traps on the sea-floor.

(3) Continental Shelf Mid-slopes, for the Three Islands (300 to 500 m interval)

The same techniques as in (iii) and (v) plus:

- (xi) Norway lobster traps on the sea-floor.
- (xii) Shrimp traps on the sea-floor.

(4) Near-shore Pelagic Species, for the Three Islands

The same techniques as in (i), (vi) and (vii) plus:

- (xiii) Horizontal longlines for medium and large-size pelagic species, drifting near the surface or in mid-water, with or without light attraction.
- (xiv) Vertical longlines for medium and large-size pelagic species drifting, with or without chumming attraction.
- (xv) Multiple surface and sub-surface trolling for medium and large-size pelagic species at night with light attraction.
- (xvi) Live bait handlines at the surface and in mid-water and pole lines at the surface for medium and large-size pelagic species.

(5) Off-shore Pelagic Species, for the Three Islands

The same techniques as in (i), (vi), (vii), (xiii), (xiv), (xv) and (xvi).

(b) Development Strategy

The strategy is the same for the three islands and is carried out in two successive stages:

(1) Exploratory and Experimental Fishing

Exploratory and experimental fishing is carried out with the above mentioned techniques and with the following objectives:

- (i) To obtain as much information as possible on the resource potential availability, importance, composition and behaviour in order to determine the possibilities of development.
- (ii) To test the apparent economic productivity of each technique in the exploitation of this potential.
- (iii) To start the adaptation of these techniques to the local environmental conditions - men, fish and sea conditions.
- (iv) To carry out the practical training of the fishermen at sea.

(2) Commercial Demonstration Fishing

This effort is applied to all the development opportunities indicated by the exploratory and experimental fishing and its objectives are:

- (i) To test the real economic productivity of the commercial type exploitation of any new development opportunity and, if results are positive, to land sufficient catches to convince fishermen to exploit this new opportunity.
- (ii) To carry out practical training of fishermen at sea.
- (iii) To follow-up the improvement of fishing techniques and data collection concerning the potential.
- (iv) To indicate the technical and financial requirements for the rapid strengthening of the development being pursued.

(c) Aruba Programme

This programme is scheduled for 12 months in order to get a global picture of the commercial productivity of the resources all year round. Its objectives are indicated in Section 4 above. Its techniques are given in Section 5 (a) (1) to (4). Its strategy is found in Section 5 (b). Its estimated cost, preliminary timetable and preliminary plan of operation are given in Annex 1.

Prior to the execution of the programme, WECAF will assist the Government in selecting the necessary boat and gear and in recruiting a masterfisherman. This masterfisherman will be paid by the Government and will arrive in the country a short time after the boat and gear have been procured. He will be responsible for carrying out the plan of operation established by the Fisheries Section, assisted by the WECAF Project. The WECAF Project will continue the technical supervision of the programme during its entire duration and will assist the Government to draw the conclusions and map out the lines of action for future development^{1/}.

Detailed descriptions of the boat and gear are found in Annex 1.

(d) Bonaire-Curaçao Programme

This programme is also scheduled for 12 months, in order to get sufficient information on the commercial productivity of the resource all year round. Its objectives are indicated in Section 4 above. Its techniques are given in Section 5 (a) (2) to (4). Its strategy is given in Section 5 (b) and its estimated cost, preliminary timetable and preliminary plan of operation are given in Annex 2.

A second masterfisherman will be recruited for this programme. The activities prior to and during execution will be as stated in Section 5 (c) - recruitment, boat and gear selection as well as elaboration, execution and control of the plan of operation, WECAF participation etc.^{1/}.

Detailed descriptions of the boat and gear are found in Annex 2.

^{1/} Assistance from the WECAF Project will depend on the contract of the Fishing Technologist being extended past 31/12/80, which in turn depends on funding being made available from the UNDP.

(e) Off-shore Waters Programme

This programme could take place after the completion of the Aruba and Curaçao-Bonaire programmes and would be common to the three islands. Due to the rather sophisticated technical level and high investment required, more information will be needed before a decision can be reached relative to its implementation. It is only if the two first programmes, especially the parts related with the medium and large pelagic species indicate a clear possibility of positive economic productivity, that this third programme should be started.

In an attempt to provide some preliminary information, its techniques are described in Section 5 (a) (5) above, while its strategy is given in Section 5 (b) and its estimated cost for 12 months in Annex 3.

6. Results

From the existing information, it is extremely difficult to give an exact indication of the real results which could be expected from this fishery development effort. An increase of the production would obviously be reached by the exploitation of the underexploited or virgin demersal resources of the Aruba continental shelf and of the continental shelf mid-slopes around the three islands. A tentative estimate indicates that this new exploitation could likely give a production fluctuating somewhere between 500 and 1 500 t a year.

The possibilities of the pelagic species are more difficult to assess. However, by an improvement of the techniques, more particularly the acoustic location of the nucleus of the concentrations, and by the intensification of the production effort during the periods when these species (especially the flying fishes and tunas) are dense around the islands, it would seem possible that a substantial increase in production could be realized, possibly in the 500 to 1 000 t yearly range.

A total increase of 1 000 to 2 500 t a year would then seem to be a possible goal. The essential results of this programme would be to determine the exactitude of this assessment, indicate how to carry out this development and have a nucleus of fishermen practically trained for its implementation.

Annex 1

Aruba Programme

1. Selection of the Fishing Techniques

All capital intensive industrial type fishing techniques, such as purse seining and trawling, are avoided for three essential reasons: (1) the reduced sea-floor surface available for demersal species; (2) the dispersion of the pelagic stocks and (3) the lack of capital compared with the abundance of manpower.

2. The Boat

As indicated in Section 2 of the report, Aruba is surrounded by a marine environment rather different from that of its sister islands. While Curaçao and Bonaire are typical oceanic islands, with extremely narrow continental shelves, the Aruban marine context, on the contrary, is characterized by its location on the mainland continental shelf, which extends for approximately 2 630 km².

In the case of Curaçao and Bonaire, fisheries can only be based essentially on pelagic species while in Aruba fishermen have to be capable of using a variety of methods and exploit pelagic and demersal species simultaneously. This situation calls for the selection of different fishing techniques and fishing boats.

In Curaçao and Bonaire a relatively light and fast 13 m boat is needed while, in Aruba the selection of a 13 m vessel is also recommended but with sufficient power and stability for operating relatively heavy demersal gear, such as bottom gill-nets, traps and Danish-style seine nets. A bigger boat could be selected with the intention of using it later for the off-shore waters programme (see Section 5 (e)). However, this is not recommended as coastal and off-shore operations will constitute separate types of enterprises in the future and since the introduction of a bigger boat than needed in Aruba programme could result in a highly distorted productivity in coastal operations, reducing considerably its demonstration value.

The basic characteristics of this Aruban unit and its estimated cost CIF Netherlands Antilles in US dollars is as follows:

(a) <u>Boat</u>	<u>US\$</u>
- material: fibreglass - hull design: forward crew quarters and wheelhouse with spacious 25 to 30 m² stern working deck - length o.a.: 13 m - beam: 4,30 m - draft: 1,50 m - displacement: 12 t - cruising speed: 10 kn - range: 3 days - engine: 150 hp diesel with electric and hand starting, generator, bilge and deck pumps. alarms, etc. - hydraulic steering - magnetic wet compass, binoculars, etc. - fish hold: insulated, 4 t capacity - crew: 4	60 000
(b) <u>Auxiliary group</u>	
- 10 hp 3.0 kW, with bilge and deck pump	3 000
(c) <u>Deck equipment</u>	
- 1 mast and 2 trolling booms	2 000
- 1 double head hydraulic capstan with pump and clutch	3 500
- 4 manual snapper reels	750
- 1 removable 2 m ³ life bait tank	1 000
- 1 searchlight	150
(d) <u>Electronic equipment</u>	
- 1 Westmar SS 160 scanning sonar with chart recorder R 500.50 rolls of paper and spares	10 450
- 1 vertical echosounder, 200 kHz, dry paper with white line, 300 m range, 50 rolls of paper and spares	600
- 1 radar, 24 mi range with manual distance ring	5 000
- 1 radio	1 300
(e) <u>Safety equipment</u>	
- 4 fire extinguishers	200
- 1 deck manual bilge pump	150
- 5 life vests	50
- 2 ring buoys	50
- 1 automatic inflatable raft for 5	1 500
- 1 set of distress signals	300
(f) <u>Miscellaneous</u>	10 000
Total estimated costs	100 000 =====

3. The Gear

The description includes estimated prices CIF Netherlands Antilles in US dollars calculated on the basis of 1978 prices FOB Miami plus 20 percent. Some of the complementary equipment of a given type of gear can be used for other types of gear.

Item No.	Description	Quantity	CIF Price in US\$	
			Unit	Total
	(1) Complete material for 2 040 m of multipurpose floating and/or demersal gill nets with spars for big, medium and small size pelagic semi-pelagic and bottom species.			
1	float and lead lines = Ø 8 mm (5/16 in) three strands twisted green PE rope	3 400 m	0.156	530.40
2	float line = Ø 6 mm (1/4 in) three strands twisted black PE rope	500 m	0.10	50.00
3	foot and lead lines = Ø 4 mm (5/32 in) blue PA braided rope	2 800 m	0.15	420.00
4	lateral lines = Ø 3 mm (1/8 in) green PA braided rope	350 m	0.177	61.95
5	branch lines for ball shape floats and markers = Ø 8 mm (5/16 in) three strands twisted green PE rope	1 000 m	0.156	156.00
6	branch lines for cement sinkers = Ø 6 mm (1/4 in) three strands twisted black PE rope	50 m	0.10	5.00
7	bridles = Ø 8 mm (5/16 in) three strands twisted green PE rope	500 m	0.156	78.00
8	marker ropes = Ø 8 mm (5/16 in) three strands twisted green PE rope	1 500 m	0.156	234.00
9	floats = hard plastic olive shape, brown 10 cm x Ø 5 cm, hole Ø 1 cm	1 500	0.30	450.00
10	floats = polystyrene ball shape, white with grommets, Ø 15 cm (6 in)	100	0.60	60.00
11	marker buoys = Ø 48 cm (19 in) PVC inflatable fluorescent red buoys	20	32.00	640.00
12	flag buoys = Ø 40 cm (16 in) PVC inflatable fluorescent red buoys with Ø 3.8 cm (1.5 in) hole	10	32.00	320.00

<u>Item No.</u>	<u>Description</u>	<u>Quantity</u>	<u>CIF Price in US\$</u>	
			<u>Unit</u>	<u>Total</u>
13	marker lights = floating marine lights No. 28-73-530	10	29.40	294.00
14	top unit No. 528-1 for item 13	3	11.94	35.82
15	battery spring No. 530-3 for item 13	5	4.20	21.00
16	cyalume lightsticks	500	1.35	675.00
17	leads = 28 g leads (No. 16) with Ø 4.70 mm hole (3/16 in)	13 000	0.06	780.00
18	hanging twine = twisted green PA hanging twine R 1 333 tex (210/48)	10 kg	11.50	115.00
19	hanging twine = twisted green PA hanging twine R 830 tex (210/30)	5 kg	12.13	60.65
20	webbing = transparent PA monofilament double knot, twine Ø 1.00 mm (No. 10), 177 mm stretched mesh (7 in), 100 meshes deep, 2 500 meshes long (1 125 x 2 + 10%)	98 kg	27.00	2 646.00
21	webbing = idem item 20, twine Ø 0.80 mm (No. 8) 152 mm stretched mesh (6 in), 100 meshes deep, 3 000 meshes long (1 315 x 2 + 10%)	66 kg	26.00	1 716.00
22	webbing = idem item 20, twine Ø 0.70 mm (No. 6) 127 mm stretched mesh (5 in) 100 meshes deep, 3 500 meshes long (1 575 x 2 + 10%)	52 kg	21.70	1 128.40
23	webbing = idem item 20, twine Ø 0.52 mm (No. 208) 101 mm stretched mesh (4 in) 80 meshes deep, 8 700 meshes long (1 967 x 4 + 10%)	42 kg	21.00	882.00
24	webbing = idem item 20, twine Ø 0.40 mm (No. 139) 76 mm stretched mesh (3 in), 100 meshes deep, 8 700 meshes long (2 625 x 3 + 10%)	25 kg	22.00	550.00
25	webbing = idem item 20, twine Ø 0.33 mm (No. 104) 51 mm stretched mesh (2 in) 150 meshes deep, 7 900 meshes long (3 580 x 2 + 10%)	17 kg	25.85	361.90
26	webbing = idem item 20, twine Ø 0.33 mm (No. 104) 41 mm stretched mesh (1.5/8 in) 180 meshes deep, 9 800 meshes long (4 445 x 2 + 10%)	20 kg	25.85	517.00
27	transparent PA monofilament wine Ø 1.00 mm (No. 10)	10 kg	8.72	87.20

Item No.	Description	Quantity	CIF Price in US\$	
			Unit	Total
28	transparent PA monofilament twine Ø 0.80 mm (No. 8)	10 kg	8.72	87.20
29	transparent PA monofilament twine Ø 0.70 mm (No. 6)	10 kg	8.72	87.20
30	transparent PA monofilament twine Ø 0.52 mm (No. 208)	10 kg	8.72	87.20
31	transparent PA monofilament twine Ø 0.40 mm (No. 139)	5 kg	8.72	43.60
32	transparent PA monofilament twine Ø 0.33 mm (No. 104)	5 kg	8.72	43.60
33	netting needles = duro nylon 20 cm x 2.5 cm	30	0.32	9.60
(2) Complete material for 10 horizontal long lines with spares, 100 hooks each, for demersal species				
34	main line = Ø 6 mm (1/4 in) three strands black PE rope	2 500 m	0.10	250.00
35	main line = Ø 2.56 mm (0.10 in) No. 36 type E yellow filament nylon line	1 000 m	0.05	50.00
36	branch line = Ø 1.0 mm (0.39 in) transparent monofilament nylon 36 kg test	650 m	0.023	14.95
37	branch line = Ø 0.6 mm (0.26 in) transparent monofilament nylon 13.6 kg test	600 m	0.006	3.60
38	leader= Ø 0.50 mm (0.20 in) SS B single strand steel wire, 39 kg test	350 m	0.088	30.80
39	hooks: Mustad 340 8 HN 110	300	0.03	9.00
	Mustad 39960ST tuna circle No. 7	500	0.128	64.00
	Mustad 3407 1/0	400	0.028	11.20
	Mustad 3407 3/0	400	0.036	14.40
	Mustad 3407 5/0	400	0.046	18.40
40	marker rope = Ø 6 mm (1/4 in) three strands black PE rope	3 000 m	0.10	300.00
41	marker buoy = polystyrene floats, white, round ball shape, Ø 30 cm (12 in)	50	2.46	123.00
42	marker lights=floating marine lights No. 28-73-530	6	29.40	176.40
43	baskets = Ø 50 cm x 38 cm (19 x 15 in)	12	12.00	144.00

Item No.	Description	Quantity	CIF Price in US\$	
			Unit	Total
<u>(3) Complete material for six 10 hooks shark long-lines with spares</u>				
44	main line = Ø 8 mm (3/16 in) three strands twisted black PE rope	2 000 m	0.082	164.00
45	anchor, float and drop lines = idem 44	1 200 m	0.082	98.40
46	hook lines = Ø 12 mm (1/2 in) 6 x 7 galvanized towing cable	30 m	1.72	51.60
47	snap swivel = 85 mm, Ø 1.90 mm	80	1.08	86.40
48	hooks = Mustad tuna 9202 B No. 10/0	200	0.75	150.00
49	marker and hook buoys = polystyrene floats, white, round ball shape, Ø 30 cm (12 in)	100	2.46	246.00
50	grapnel anchor - 6 hooks, 7 kg (15 lb)	7	66.00	462.00
51	shark gun No. 5260 for 12-gauge shells	1	110.10	110.10
52	12 gauge shells	100	0.50	50.00
<u>(4) Complete material for five vertical long-lines with spares, 20 hooks each for demersal and semi-pelagic species</u>				
53	main lines = Ø 6 mm (1/4 in) three strands twisted black PE rope	1 500 m	0.10	150.00
54	branch line = Ø 1.0 mm (0.39 in) transparent monofilament nylon 36 kg test	300 m	0.023	6.90
55	snap-on connectors with swivel	100	0.86	86.00
56	hooks = Mustad 39960 ST tuna circle No. 7	200	0.128	25.60
57	leads = 3.5 kg. sounding lead	10	7.00	70.00
58	floats = polystyrene, white, round ball shape Ø 30 cm (12 in)	20	2.46	49.20
<u>(5) Complete material with spares for multiple surface, sub-surface and near-floor trolling pelagic, semi-pelagic and demersal species</u>				
59	main lines and lazy lines = No. 60 braided PA seine twine Ø 3 mm (.119 in)	1 000 m	0.064	64.00
60	leader = Ø 1.6 mm (.063 in) transparent monofilament nylon, 91 kg test	200 m	0.089	17.80

Item No.	Description	Quantity	CIF Price in US\$	
			Unit	Total
61	leader = Ø 1.4 mm (.055 in) transparent monofilament nylon, 68 kg test	200 m	0.058	11.60
62	depressor lines = Ø 4.7 mm (3/16 in) 6 x 7 galvanized steel cable	200 m	0.83	166.00
63	double main line = Ø 1.6 mm (1/16 in) 7 x 7 pre-formed stainless steel cable, 220 kg test	500 m	0.396	198.00
64	branch lines = Ø 1.8 mm (.071 in) monofilament nylon 113 kg test	400 m	0.095	38.00
65	leader = Ø 0.9 mm (.033 in) single strand wire SS 14, 100 kg test	100 m	0.144	14.40
66	cable connectors = for Ø 1.6 mm (1/16 in) cable	500	0.108	54.00
67	hand swager No. 00 for connectors	1	22.50	22.50
68	snap swivels = kelux size 4/0, 160 kg test	50	0.280	14.00
69	main line blocks = Ø 153 mm (6 in) nylon sheave "heavy duty"	4	19.80	79.20
70	drone bait - size 4, 15.6 cm (6 1/4 in) blade 12/0 hook	10	4.44	44.40
71	hooks	200	0.50	100.00
72	depressors	2	50.00	100.00
73	artificial lures	80	4.00	320.00
(6) Complete material for three jigging hand lines with spares, 20 hooks each, for medium and small size pelagic and semi-pelagic species				
74	main line = Ø 1.2 mm (.051 in) monofilament, transparent nylon 57 kg test	400 m	0.05	20.00
75	branch line = Ø 1.0 mm (.039 in) monofilament transparent nylon 36 kg test	50 m	0.023	1.15
76	hook line = Ø 0.5 mm (.020 in) monofilament transparent nylon 9 kg test	100 m	0.012	1.20
77	hook = Mustad-Kirby 2330 No. 13	100	0.012	1.20
	" " " " No. 11	100	0.016	1.60
	" " " " No. 9	100	0.020	2.00
78	lead = 1 kg, cylinder shape	4	2.70	10.80

Item No.	Description	Quantity	CIF Price in US\$	
			Unit	Total
	<u>(7) Complete material for one danish seine with spares for demersal fish and shrimp</u>			
79	webbing = twisted PA multifilament tarred twine R 830 tex (210/30), 80 mm stretched mesh (3 1/8 in), 200 meshes deep, 350 meshes long	11 kg	8.70	95.70
80	webbing = twisted PA multifilament tarred twine R 100 tex (210/36), 50 mm stretched mesh (2 in), 200 meshes deep, 1 000 meshes long	29 kg	8.60	249.40
81	webbing = twisted PA multifilament tarred twine R 2666 tex (210/96), 44 mm stretched mesh, (1.3/4 in) 200 mesh deep, 100 meshes long	7 kg	8.90	62.30
82	head line = stainless steel combination rope Ø 10 mm (3/8 in) 6 x 7	70 m	2.06	144.20
83	foot rope = stainless steel combination rope Ø 13 mm (1/2 in) 6 x 7	70 m	2.70	189.00
84	chain = Ø 8 mm (5/16 in)	30 kg	3.90	117.00
85	floats = plastic Ø 120 mm (4.3/4)	100	4.50	45.00
86	chucho = Ø 16 mm (5/8 in) three strands twisted yellow PE rope	60 m	0.425	25.50
87	twisted PA multifilament tarred twine R 1000 tex (210/36)	15 kg	7.24	108.60
88	twisted PA multifilament tarred twine R 2666 tex (210/96)	15 kg	7.24	108.60
89	bridles = stainless steel combination rope Ø 13 mm (1/2 in) 6 x 7	100 m	2.70	270.00
90	sweep lines = Ø 50 mm (2 in) 3 strands twisted manila rope	200 m	5.77	1 154.00
91	sweep lines = Ø 25 mm (1 in) 3 strands twisted dacron rope	200 m	5.55	1 110.00
92	towing cable Ø 8 mm (5/16 in) galvanized steel cable 6 x 7	1 000 m	1.40	1 400.00
	<u>(8) Complete material for 4 multiple bottom hand- lines with spares operated through manual reels</u>			
93	line = preformed stainless steel cable Ø 1.20 mm (3/64 in) 7 x 7	1 500 m	0.31	465.00

Item No.	Description	Quantity	CIF Price in US\$	
			Unit	Total
94	cable connectors = $\emptyset$ 1.20 mm (3/64 in)	200	0.10	20.00
95	hand swager = No. 00	2	22.50	45.00
96	rubber snubber = 40 cm (15.3/4 in)	15	3.52	52.80
97	snap swivel = rosco stainless steel, RCS No. 4/0, 159 kg test	50	0.28	14.00
98	three way swivel = No. 5/0	400	0.132	52.80
99	Leader and branch lines = $\emptyset$ 190 mm (0.75 in) transparent monofilament nylon, 136 kg test	150 m	0.108	16.20
100	leader and branch lines = $\emptyset$ 1.6 mm (.063 in) transparent monofilament nylon, 91 kg test	200 m	0.089	17.80
101	leader and branch lines = $\emptyset$ 1.4 mm (.044 in) transparent monofilament nylon, 68 kg test	200 m	0.058	11.60
102	leader = gauge 16 soft galvanized tie wire	4.5 kg	2.00	9.00
103	leads = 3.5 kg sounding lead	10	7.00	70.00
	2.5 kg sounding lead	10	6.00	60.00
	1.0 kg sounding lead	5	4.00	20.00
104	hooks = Mustad 39960ST tuna circle No. 6	200	0.148	29.60
	" " " " No. 7	400	0.128	51.20
	" " " " No. 8	200	0.12	24.00
(9) Complete material for 20 Z type fish traps (two entrances) with spares				
105	mesh wire = mesh size 25 mm (1 in) wire gauge 18, roll 45 m long, 1.52 m wide	7	171.60	1 201.20
106	tie wire = 18 gauge	5 kg	2.12	10.60
107	zinc anode = 225 g	20	0.90	18.00
108	marker line = $\emptyset$ 6 mm (1/4 in) three strands twisted black PE rope	2 000 m	0.10	200.00
109	marker buoys = polystyrene floats, white round ball shape, $\emptyset$ 30 cm (12 in)	50	2.46	123.00
(10) Complete material for 20 Norway lobster traps with spares				
110	armature = $\emptyset$ 5.0 mm galvanized wire	16 kg	2.50	40.00

Item No.	Description	Quantity	CIF Price in US\$	
			Unit	Total
111	webbing = multifilament PA tarred twine R 1333 tex (210/48), 38 mm stretched meshes (1.5 in) 200 meshes deep, 200 meshes long	8 kg	8.04	64.32
112	twine = PA tarred R 1333 tex (210/48)	2 kg	7.24	14.48
113	rings = plastic Ø 8 mm, inside Ø 100 mm	20	1.00	20.00
114	main line = Ø 6 mm (1/4 in) 3 strands black PE rope	1 000 m	0.10	100.00
115	marker lines = Ø 6 mm (1/4 in) black PE rope	1 400 m	0.10	140.00
<u>(11) Complete material for 40 shrimp traps with spares</u>				
116	armature = Ø 5.0 mm galvanized wire	40 kg	2.50	100.00
117	tie wire = 18 gauge	5 kg	2.12	10.60
118	zinc anode = 225 G	20	0.90	18.00
119	mesh wire = mesh size 12 mm (1/2 in) wire gauge 18, roll 45 m long, 1.52 m wide	3	171.60	514.80
120	main line = Ø 6 mm (1/4 in) 3 strands black PE rope	1 000 m	0.10	100.00
121	marker lines = Ø 6 mm (1/4 in) 3 strands black PE rope	2 000 m	0.10	200.00
<u>(12) Complete material for a 100 hooks 5 000 m long long-line with spares for big and medium size pelagic species</u>				
122	main line = Ø 4.70 mm (3/16 in) extra hard lay nylon line	6 000 m	0.091	546.00
123	drop line = Ø 4.7 mm (3/16 in) extra hard lay nylon line	1 500 m	0.091	136.50
124	hook line = Ø 1.2 mm (3/64 in) 7 x 7 preformed stainless steel cable 122 kg test	600 m	0.276	165.60
125	cable connectors for Ø 1.2 mm (3/64 in) cable	500	0.108	54.00
126	snap-swivel = kelux size 4/0, 160 kg test	120	0.280	33.60
127	hooks = Mustad tuna 9202 B - 7/0	150	0.60	90.00
128	marker buoy line = Ø 6 mm (1/4 in) 3 strands twisted black PE rope	300 m	0.053	15.90

Item No.	Description	Quantity	CIF Price in US\$	
			Unit	Total
129	floats = inflatable PVC fluorescent red buoys Ø 40 cm (16 in)	10	26.82	268.20
130	flag buoys = Ø 40 cm (16 in) PVC inflatable fluorescent red spare buoy with Ø 3.8 cm (1.5 in) hole	2	32.00	64.00
131	floats = polystyrene floats, white round ball shape, Ø 30 cm (12 in)	15	2.46	36.90
132	baskets = Ø 50 cm x 38 cm (19 in x 15 in)	10	12.00	120.00
(13) Complete material for 10 vertical long-lines with spares, 10 hooks each for big and medium-size pelagic species				
133	main line = Ø 4.7 mm (No. 16) 3 strands tarred nylon trawl line	700 m	0.103	72.10
134	connecting line = Ø 4.7 mm (No. 16) 3 strands tarred nylon trawl line	600 m	0.103	61.80
135	branch line = Ø 1.8 mm (0.71 in) monofilament nylon, 113 kg test	200 m	0.095	19.00
136	hooks = Mustad 3407SS No. 11/0	200	0.293	58.60
137	three ways swivel No. 5/0	150	0.122	18.30
138	marker buoys = polystyrene floats, white round ball shape, Ø 30 cm (12 in)	25	2.46	61.50
139	baskets = Ø 50 cm x 38 cm (19 x 15 in)	2	12.00	24.00
(14) Complete material with spares for surface and mid-water hand lines and pole and line for medium and big-size pelagic species				
140	main lines = No. 60 braided PA seine twine Ø 3 mm (.119 in)	500 m	0.064	32.00
141	leaders = Ø 1.6 mm (.063 in) transparent monofila- ment nylon, 91 kg test	300 m	0.089	26.70
142	leaders = Ø 1.0 mm (.039 in) transparent monofila- ment nylon, 36 kg test	300 m	0.058	17.40
143	poles = bamboo 4.00 m, Ø 5.0 cm	20	2.00	40.00
144	Hooks = Mustad 7692 No. 10	50	0.50	25.00
	" " No. 14	50	0.90	45.00

<u>Item No.</u>	<u>Description</u>	<u>Quantity</u>	<u>CIF Price in US\$</u>	
			<u>Unit</u>	<u>Total</u>
145	gloves = white nylon, medium, dozen	2	14.00	28.00
	(15) Complete material for 10 anchored attraction and concentration rafts			
146	anchoring lines = Ø 4.7 mm (3/16 in) 3 strand black PE line	6 000 m	0.061	<u>366.00</u>
Estimated total CIF price				<u><u>28 870.92</u></u>

4. Total Cost Estimated of the Programme

(a) <u>Gross Cost</u>	<u>Duration</u> (months)	<u>Cost US\$</u>
(1) <u>Shore personnel and infrastructure</u>		
- 1 Programme Leader	18	- 1/2/
- 1 Programme Assistant	12	12 000
- 1 Pick-up truck	12	10 000
- 1 Storeroom for fishing gear	12	2 400
(2) <u>Sea-going personnel</u>		
- 1 Masterfisherman		60 000 ^{3/}
- 4 Fishermen		24 000 ^{4/}
- Fishermen's insurance = 10% salary		2 400
(3) <u>Boat, equipment and gear</u>		
- 1 13 m boat, 150 hp, complete with electronic and deck equipment, according to Section 2 of this Annex	12	100 000
- Fishing gear according to Section 3 of this Annex		28 870
- Making of fishing gear - 10% of value		2 850
(4) <u>Consumable items, maintenance and insurance</u>		
- Fuel = 250 sea days x 350 l x US\$ 0.20		17 500 ^{4/}
- Gasoline		2 000
- Lub-oil = 10% fuel		1 750
- Ice = 180 t x US\$ 50		9 000 ^{4/}
- Food = 250 sea days x 5 x US\$ 3		3 750
- Boat maintenance = 5% value		5 000
- Gear maintenance, manpower = 10% value		2 850
- Pick-up truck maintenance = 10% value		1 000
- Boat insurance = 10% value		10 000
- Pick-up truck insurance = 10% value		1 000
(5) <u>Trips and miscellaneous</u>		
- 4 trips by the WECAF Fishing Technologist from Panama with 30 days travel allowance		3 000
- Reporting and miscellaneous		3 000
Total Cost Estimated		<u>302 370</u>

1/ This Programme Leader will be an actual staff member of the Government and will remain on the Government's payroll. He will be recruited when project funds are made available.

2/ The Programme Assistant will be the ship's husband and accountant; his salary is estimated.

3/ The masterfisherman will be recruited on a FAO basis. The sum given covers all expenses including travel, insurance, pension, contributions, etc.

4/ These costs are estimates.

(b) Estimated Production Value

During the programme certain quantities of fish will be caught and sold. On the basis of 5 t a month at US\$ 2 000 per t, which seems a possible goal by exploiting the demersal and pelagic species, the programme would produce US\$ 120 000.

(c) Residual Value

The boat will normally last 10 years, the pick-up truck 3 years and the fishing gear 1 1/2 years. This means that at the end of the programme there would be the following residual values:

<u>Fishing gear</u>	<u>US\$ 28 870.92 x 6 months</u> 18 months	<u>US\$</u> 9 623.43
<u>Pick-up truck</u>	<u>US\$ 10 000 x 24 months</u> 36 months	6 666.66
<u>Boat</u>	<u>US\$ 100 000 x 108 months</u> 120 months	<u>89 999.99</u>
Total residual value		106 290.08 =====

(d) Estimated Net Cost

The net cost of the programme would be then approximately the following:

Gross cost		302 370.00
Production value	120 000.00	
Residual value	106 290.08	<u>226 290.08</u>
Estimated net cost		76 079.92 =====

5. Preliminary Timetable

- Day 1
- The Government institutions take the decision to carry out the programme and funds are made available
 - The Programme Leader is assigned
 - He informs WECAF
 - WECAF requests FAO (Rome) to start the recruitment of the Masterfisherman
- Day 10 to 20
- WECAF Fishing Technologist comes to Aruba and, with the Programme Leader, settles the details for boat and gear selection
 - Boat and gear are ordered
- Day 120
- The Programme Assistant is recruited
 - The pick-up truck is acquired
 - The storeroom is rented
 - The Programme Leader and the Assistant make a pre-selection of 20 fishermen

- Day 125
 - Boat and gear arrive in Aruba
- Day 130
 - The Masterfisherman is recruited
- Day 135 to 140
 - The Masterfisherman and WECAF Fishing Technologist arrive in Aruba
 - They recruit four crew members from the 20 pre-selected fishermen
 - They recruit two occasional gear menders
 - They prepare the boat and part of the fishing gear
 - In collaboration with the Programme Leader they refine the plan of operation
- Day 141 to 146
 - The Masterfisherman and WECAF Fishing Technologist make the first four-day trip for trial and adjustments
- Day 146
 - WECAF Fishing Technologist reports to the Programme Leader, gives instructions to the Masterfisherman and leaves the country
- Day 146 to 206
 - The Masterfisherman carries out a commercial type investigation of all the potentials in accordance with the objectives and the plan of operation. His sea time is of 45 days approximately
- Day 207 to 327
 - The Masterfisherman carries out simulated commercial fishing on the best resource potential found during the commercial type investigation. His sea time is 84 days approximately
- Day 328 to 338
 - WECAF Fishing Technologist comes to Aruba
 - In collaboration with the Programme Leader and Masterfisherman he evaluates the first half of the programme and, if necessary, re-orientates its second part
 - The crew is changed in order to give training to four new fishermen
 - WECAF Fishing Technologist makes a five-day trip with the Masterfisherman and leaves Aruba
- Day 339 to 370
 - Idem to day 146 to 206, approximate sea time: 21 days
- Day 371 to 490
 - Idem to day 207 to 327, approximate sea time: 91 days
- Day 491 to 495
 - Sea operations are ended on day 471, having produced about 252 sea days
 - WECAF Fishing Technologist, in collaboration with the Masterfisherman, prepares the final report which is presented to the Programme Leader
 - Meeting is held with the interested Government Institution for discussion respecting the possible extension of the programme and recommendations for future development

Day 495

- The Masterfisherman terminates his contract and the WECAF Fishing Technologist leaves Aruba.

6. Preliminary Plan of Operation

(a) Exploratory and Experimental Fishing

The objectives of this effort are given in Section 5 (b) (1) of the programme as indicated by the timetable in Section 5 of this Annex. Two exploratory and experimental fishing activities are carried out, one at the very beginning of the programme, the other six months later.

(1) The first activity

It is carried out during 45 sea days. It is longer than the second because it has to present an overall picture of the resources and of the most adequate techniques for their exploitation. This effort is carried out simultaneously with several fishing techniques put into action in rather small areas in order to obtain information not only on stock importance, composition and behaviour but also on the productivity of alternative gears.

The sea time is divided between 15 trips of three days each with the following work programme:

Trip No. 1 to 8

- Sea time: 24 days
- Area: Continental shelf
- Interval: 50-200 m
- Distribution system: techniques (i) to (v) (see Section 5 (a) (1) of the programme for their identification) are used together in clusters rather regularly distributed among the 15 squares, 100 km² each, covering the area to be investigated; technique (viii) is used all over the area with an approximate density of one operation every 20 km²; techniques (vi) and (vii) are used between the previously mentioned operations.

<u>Day Work</u>	<u>No. of Days</u>	<u>Total No. of Stations</u>
(i) 4 nets of 120 m	simultaneously 15	60
(ii) 3 nets of 120 m		45
(iii) 2 lines of 100 hooks		30
(iv) 2 lines of 10 hooks		30
(v) 3 lines of 20 hooks		45
(vi) and (vii) between stations	9	-
(viii) 7 operations, 2 hours each		63

Trip No. 9 to 11

- Sea time: 9 days
- Area: drop-off

- Interval: 100-300 m
- Distribution system: techniques (i) to (x) are used in clusters in areas at approximate intervals of 25 km along the drop-off; techniques (xiii) and (xiv) are used in clusters in areas at intervals of about 30 km; techniques (vi) and (vii) are used as during the previous trips (No. 1-8); techniques (xv) and (xvi) are not put to use but left for experiments during the simulated commercial fishing operations.

<u>Day Work</u>	<u>No. of Days</u>	<u>Total No. of Stations</u>
(i) 4 nets of 120 m	6	24
(iii) 2 lines of 100 hooks		12
(iv) 2 lines of 10 hooks		12
(v) 3 lines of 20 hooks		18
(ix) 10 operations, 0.5 hour each		60
(x) 10 traps		60
(vi) and (vii) between stations		-

<u>Day Work</u>	<u>No. of Days</u>	<u>Total No. of Stations</u>
(xiii) 1 line of 100 hooks	3	3
(xiv) 4 lines of 10 hooks		12
(vi) and (vii) between stations		-

Trip No. 12 to 15

- Sea time: 12 days
- Area: Mid-slopes
- Interval: 300-500 m
- Distribution system: techniques (iii) to (v) are used in clusters and rather regularly distributed among the 6 squares, 85 km² each, covering the area prospected; techniques (xiii) and (xiv) are used and distributed in the same way; techniques (vi) and (vii) are used as during the previous trips.

<u>Day Work</u>	<u>No. of Days</u>	<u>Total No. of Stations</u>
(iii) 4 lines of 100 hooks	6	24
(v) 3 lines of 20 hooks		18
(xi) 20 traps		120
(xii) 40 traps		240
(vi) and (vii) between stations		-
(xiii) 2 lines of 100 hooks	6	12
(xiv) 2 lines of 10 hooks		12
(vi) and (vii) between stations		-

(2) The second activity

It is carried out during 21 sea days. It follows the same general pattern as the first part of the programme (see Section 6 (a) of this Annex), but with less density. Its main purpose is in reality to establish the seasonal variations

of the resources. The sea time is divided between seven trips of three days each, with the following work programme:

Trips No. 1 to 4

- Sea time: 12 days
- Area: Continental shelf
- Interval: 50-200 m
- Distribution system: same as the first effort (see Section 6 (a) (1) of this Annex) but with half the density.

<u>Day Work</u>	<u>No. of Days</u>	<u>Total No. of Stations</u>
(i) 4 nets of 120 m	simultaneously 9	36
(ii) 3 nets of 120 m		27
(iii) 2 lines of 100 hooks		18
(iv) 2 lines of 10 hooks		18
(v) 3 lines of 20 hooks		27
(vi) and (vii) between stations	3	-
(viii) 7 operations of 2 hours each		21

Trips No. 5 and 6

- Sea time: 6 days
- Area: Drop-off
- Interval: 100-300 m
- Distribution system: the same as for the first effort (see Section 6 (a) (1) of this Annex) but with proportional diminution of the density.

<u>Day Work</u>	<u>No. of Days</u>	<u>Total No. of Stations</u>
(i) 4 nets of 120 m	4	16
(ii) 2 lines of 100 hooks		8
(iv) 2 lines of hooks		8
(v) 3 lines of 20 hooks		12
(ix) 10 operations of 0.5 hours each		40
(x) 10 traps		40
(vi) and (vii) between stations		-

<u>Day Work</u>	<u>No. of Days</u>	<u>Total No. of Stations</u>
(xiii) 1 line of 100 hooks	2	2
(xiv) 4 lines of 10 hooks		8
(vi) and (vii) between stations		-

Trip No. 7

- Sea time: 3 days
- Area: Mid-slopes
- Interval: 300-500 m
- Distribution system: the same as for the first effort (see Section 6 (a) (1) of this Annex) but with proportional diminution of the density. The rather sharp proportional decrease of this exploratory exercise is due to the great emphasis it received during the first effort.

<u>Day Work</u>	<u>No. of Days</u>	<u>Total No. of Stations</u>
(iii) 4 lines of 100 hooks		12
(v) 3 lines of 20 hooks	3	9
(xi) 20 traps		60
(xii) 40 traps		120
(vi) and (vii) between stations		-

(b) Commercial Demonstration Fishing

The objectives of this effort are given in Section 5 (b) (2) of the programme. As indicated by the timetable in Section 5 of this Annex, a total of 175 sea days will be spent in simulated commercial fishing.

Before getting the results of the first exploratory and experimental fishing effort (See Section 6 (a) (1) of this Annex), it is of course not possible to prepare a preliminary plan of operation for the simulated commercial operations.

In general terms, it can be said that the fundamental strategy will be exactly the same as in purely commercial fishing, which is that necessary to obtain the maximum catch return at the minimum cost, i.e., the optimum economic productivity.

The success of such an exercise depends essentially on the masterfisherman's ability to adapt his catching effort to the fluctuations of the resource, the environment and the market. In assessing this variables he will be assisted by the programme leader, who will act more or less as a fishing company manager, and by the WECAF fishing technologist, who will act as a senior fishing adviser.

Annex 2

Bonaire-Curaçao Programme

1. Selection of the Techniques

As in the case of Aruba (see Annex 1), all capital intensive industrial type techniques are avoided and, on the contrary, artisanal types more appropriate to the local context are selected.

2. The Boat

As indicated in Annex 1, Section 2, fishing conditions in Curaçao and Bonaire impose a type of boat slightly different from the one for Aruba. A 13 m boat is recommended for the three islands of Curaçao, Bonaire and Aruba, but the one for Curaçao and Bonaire needs to be lighter and faster than the other for the more efficient exploitation of the pelagic species.

The basic characteristics of such a unit, and its estimated CIF cost in US\$, Netherlands Antilles, are the following:

(a) Boat

- Material	: Fiberglass	
- Hull design	: Mid ship wheel house	
- Length O.A.	: 13 m	
- Beam	: 3.20 m	
- Draft	: 1.10 m	
- Displacement	: 10 t	
- Cruising speed	: 12 kn	
- Range	: 3 days	
- Engine	: 100 hp diesel with electric and hand starting generator, bilge and deck pump, alarms, etc.	
- Fish hold	: Insulated 3 t capacity	
- Life bait tank	: 2 m ³	
- Hydraulic steering		
- Magnetic wet compass, binoculars, etc.		
- Crew	: 4	70 000

(b) Auxiliary Group

- 10 hp, 3.0 kw, with bilge and deck pump	3 000
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(c) Deck Equipment

- 1 mast with two trolling booms	2 000
- 1 hydraulic powerblock-linehauler with warping head with pump and clutch	6 000
- 1 hydraulic long-line drum, capacity 20 000 m Ø 4.70 mm line	2 000
- manual snapper reels	750
- 1 searchlight	150

(d) Electronic Equipment

- 1 Westmar SS 160 scanning sonar with chart recorder R 500, 50 rolls of paper and spares	10 450
- 1 vertical echosounder, 200 kHz, dry paper with white line, 300 m range, 50 rolls of paper and spares	600
- 1 radar, 24 mi range with manual distance ring	5 000
- 1 radio	1 300

(e) Safety Equipment

- 4 fire extinguishers	200
- 1 deck manual bilge pump	150
- 5 safety vests	50
- 2 ring buoys	50
- 1 automatic inflatable raft for 5	1 500
- 1 set of distress signals	300

(f) <u>Miscellaneous</u>	10 000
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Total Estimated Costs	US\$	<u>113 500</u>
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<u>Item No.</u>	<u>Description</u>	<u>Quantity</u>	<u>CIF Price in US\$</u>	
			<u>Unit</u>	<u>Total</u>
	(1) Complete material for 2 640 m of floating gill-net for big, medium and small size pelagic species			
1	Float lines = Ø 8 mm (5/16 in) 3 strands twisted green PE rope	2 500 m	0.156	390.00
2	float lines = Ø 6 mm (1/4 in) 3 strands twisted black PE rope	550 m	0.100	55.00
3	foot lines = Ø 4 mm (5/32 in) blue PA braided rope	3 000 m	0.15	450.00
4	lateral lines = Ø 3 mm (1/8 in) green PE braided rope	700 m	0.177	123.90
5	branch lines for ball shape floats and markers = Ø 8 mm (5/16 in) 3 strands twisted green PE rope	1 200 m	0.156	187.20
6	branch lines for cement sinkers = Ø 6 mm (1/4 in) 3 strands twisted black PE rope	250 m	0.100	25.00
7	bridles = Ø 8 mm (5/16 in) 3 strands twisted green PE rope	500 m	0.156	78.00
8	floats = hard plastic olive shape, brown 10 cm x Ø 5 cm, hole Ø 1 cm	1 700	0.300	510.00
9	floats = polystyrene ball shape, white with grommets, Ø 15 cm (6 in)	400	0.600	240.00
10	marker buoys = Ø 48 cm (19 in) PVC inflatable fluorescent red buoys	20	32.00	640.00
11	flag buoys = Ø 40 cm (16 in) PVC inflatable fluorescent red buoys with Ø 3.8 cm (1.5 in) hole	10	32.00	320.00
12	marker lights = floating marine lights No. 28-73-530	10	29.40	294.00
13	top unit No. 528-1 for item 12	3	11.94	35.82
14	battery spring No. 530-3 for item 12	5	4.20	21.00
15	cyalume lighsticks	500	1.35	675.00
16	leads = 28 g round leads (No. 16) with Ø 4.70 mm hole (3/16 in)	3 000	0.06	180.00
17	hanging twine - twisted green PA hanging twine R 1333 Tex (210/48)	13 kg	11.50	149.50
18	hanging twine = twisted green PA hanging twine R 830 Tex (210/30)	6 kg	12.13	72.78

Item No.	Description	Quantity	CIF Price in US\$	
			Unit	Total
19	webbing = transparent PA monofilament double knot, twine Ø 1.00 mm (No. 10) 177 mm stretched mesh (7 in), 100 meshes deep, 3 700 meshes long (1 125 x 3 + 10%)	145 kg	27.00	3 915.00
20	webbing = idem item 19, twine Ø 0.80 mm (No. 8) 152 mm stretched mesh (6 in) 120 meshes deep, 5 800 meshes long (1 313 x 4 + 10%)	153 kg	26.000	3 978.00
21	webbing = idem item 20, twine Ø 0.70 mm (No. 6) 127 mm stretched mesh (5 in) 150 meshes deep, 7 000 meshes long (1 575 x 4 + 10%)	156 kg	21.70	3 385.20
22	webbing = idem item 20, twine Ø 0.52 mm (No. 208) 101 mm stretched mesh (4 in) 150 meshes deep, 8 700 meshes long (1 967 x 4 + 10%)	79 kg	21.00	1 659 000.
23	webbing = idem item 20, twine Ø 0.40 mm (No. 139) 76 mm stretched mesh (13 in) 150 meshes deep, 8 700 meshes long (2 625 x 3 + 10%)	37 kg	22.00	814.00
24	webbing = idem item 20, twine Ø 0.33 (No. 104) 51 mm stretched mesh (2 in) 200 meshes deep, 7 900 meshes long (3 580 x 2 + 10%)	23 kg	25.85	594.55
25	webbing - idem item 20, twine Ø 0.33 (No. 104) 41 mm stretched mesh (1.5/8 in) 200 meshes deep, 9 800 meshes long (4 445 x 2 + 10%)	22 kg	25.85	568.70
26	transparent PA monofilament twine Ø 1.00 mm (No.10)	10 kg	8.72	87.20
27	transparent PA monofilament twine Ø 0.80 mm (No.8)	10 kg	8.72	87.20
28	transparent PA monofilament twine Ø 0.70 mm (No.6)	10 kg	8.72	87.20
29	transparent PA monofilament twine Ø 0.52 mm (No.208)	10 kg	8.72	87.20
30	transparent PA monofilament twine Ø 0.40 mm (No.139)	5 kg	8.72	43.60
31	transparent PA monofilament twine Ø 0.33 mm (No.104)	5 kg	8.72	43.60
32	netting needles = duro nylon 20 cm x 2.5 cm	30	0.32	9.60

Item			CIF Price in US\$	
No.	Description	Quantity	Unit	Total
	(2) Complete material for 10 horizontal long lines with spares, 100 hooks each for demersal species			
33	main line = Ø 6 mm (1/4 in) 3 strands black PE rope 2 500 m		0.100	250.00
34	main line = Ø 2.56 mm (0.10 in) No. 36 type E yellow filament nylon line	1 000 m	0.05	50.00
35	branch line = Ø 1.0 mm (0.39 in) transparent monofilament nylon 36 kg test	650 m	0.023	14.95
36	branch line = Ø 0.6 mm (0.26 in) transparent monofilament nylon 13.6 kg test	600 m	0.006	3.60
37	leader: Ø 0.50 mm (0.20 in) SSB single strand steel wire, 39 kg test	350 m	0.088	30.80
38	hooks = Mustad 340 8 HN 110	300	0.030	9.00
	Mustad 399 60 ST tuna circle No. 7	500	0.128	64.00
	Mustad 3407 1/0	400	0.028	11.20
	Mustad 3407 3/0	400	0.036	14.40
	Mustad 3407 5/0	400	0.046	18.40
39	marker rope = Ø 6 mm (1/4 in) 3 strands black PE rope	3 000 m	0.100	300.00
40	marker buoy = polystyrene floats, white round ball shape, Ø 30 cm (12 in)	50	2.46	123.00
41	marker lights = floating marine lights No. 28-73-530	6	29.40	176.40
42	baskets = Ø 50 cm x 38 cm (19 x 15 in)	12	12.00	144.00
(3) Complete material for six 10 hooks shark long lines with spares				
43	main line = Ø 8 mm (3/16 in) 3 strands twisted black PE rope	2 000 m	0.082	164.00
44	anchor, float and drop lines = idem 43	1 200 m	0.082	98.40
45	hook lines = Ø 12 mm (1/2 in) 6 x 7 galvanized towing cable	30 m	1.72	51.60
46	snap swivel = 85 mm, Ø 1.90 mm	80	1.08	86.40
47	hooks = Mustad tuna 9202 B No. 10/0	200	0.75	150.00
48	marker and hook buoys = polystyrene floats, white round ball shape, Ø 30 cm (12 in)	100	2.46	246.00
49	grapnel anchor = 6 hooks, 7 kg (15 lb)	7	66.00	462.00

Item No.	Description	Quantity	CIF Price in US\$	
			Unit	Total
50	shark gun No. 5260 for 12-gauge shells 12-gauge shells	1 100	110.10 0.50	110.10 50.00
(4) Complete material for 5 vertical long lines with spares, 20 hooks each for demersal and semi-pelagic species				
51	main lines = Ø 6 mm (1/4 in) 3 strands twisted black PE rope	1 500 m	0.100	150.00
52	branch line = Ø 1.0 mm (0.39 in) transparent monofilament nylon 36 kg test	300 m	0.023	6.90
53	snap-on connectors with swivel	100	0.86	86.00
54	hooks = Mustad 39960 ST tuna circle No. 7	200	0.128	25.60
55	leads = 3.5 kg sounding lead	10	7.00	70.00
56	floats = polystyrene, white round ball shape Ø 30 cm (12 in)	20	2.46	49.20
(5) Complete material with spares for multiple surface, sub-surface and near-floor trolling pelagic, semi-pelagic and demersal species				
57	main lines and lazy lines = No. 60 braided PA seine twine Ø 3 mm (.119 in)	1 000 m	0.064	64.00
58	leader = Ø 1.6 mm (.063 in) transparent mono- filament nylon, 91 kg test	200 m	0.089	17.80
59	leader = Ø 1.4 mm (.055 in) transparent monofilament nylon, 68 kg test	200 m	0.058	11.60
60	depressor lines = Ø 4.7 mm (3/16 in) 6 x 7 galvanize steel cable	200 m	0.83	166.00
61	double main line = Ø 1.6 mm (1/16 in) 7 x 7 preformed stainless steel cable 220 kg test	500 m	0.396	198.00
62	branch line = Ø 1.8 mm (.071 in) monofilament nylon, 113 kg test	400 m	0.095	38.00
63	leader = Ø 0.9 mm (.033 in) single strand wire SS 14, 100 kg test	100 m	0.144	14.40
64	cable connectors = for Ø 1.6 mm (1/16 in) cable	500	0.108	54.00
65	hand swager No. 00 for connectors	1	22.50	22.50
66	snap swivels = Kelux size 4/0, 160 kg test	50	0.280	14.00

Item No.	Description	Quantity	CIF Price in US\$	
			Unit	Total
67	main line blocks = Ø 153 mm (6 in) nylon sheave "heavy duty"	4	19.80	79.20
68	drone bait = size 4, 15.6 cm (6 1/4 in) blade 12/0 hook	10	4.44	44.40
69	hooks	200	0.50	100.00
70	depressors	2	50.00	100.00
71	artificial lures	80	4.00	320.00
(6) Complete material for 3 jigging hand- lines with spares, 20 hooks each, for medium and small size pelagic and semi-pelagic species				
72	main lines = Ø 1.2 mm (.051 in) monofilament, transparent nylon 57 kg test	400 m	0.050	20.00
73	branch line = Ø 1.0 mm (.039 in) monofilament transparent nylon 36 kg test	50 m	0.023	1.15
74	hook line = Ø 0.5 mm (0.20 in) monofilament transparent nylon 9 kg test	100 m	0.012	1.20
75	hook = Mustad-kirby 2330 No. 13	100	0.012	1.20
	" " " " No. 11	100	0.016	1.60
	" " " " No. 9	100	0.020	2.00
76	lead = 1 kg, cylinder shape	4	2.70	10.80
(7) Complete material for 4 multiple bottom hand- lines with spares operated through manual reels				
77	line = preformed stainless steel cable Ø 1.20 mm (3/64 in) 7 x 7	1 500 m	0.310	465.00
78	cable connectors = Ø 1.20 mm (3/64 in)	200	0.100	20.00
79	hand swager = No. 00	2	22.50	45.00
80	rubber snubber = 40 cm (15.3/4 in)	15	3.52	52.80
81	snap swivel = rosco stainless steel, RCS No. 4/0, 159 kg test	50	0.28	14.00
82	three way swivel = No. 5/0	400	0.132	52.80
83	leader and branch lines = Ø 190 mm (0.75 in) transparent monofilament nylon 136 kg test	150 m	0.108	16.20
34	leader and branch lines Ø 1.6 mm (.063 in) transparent monofilament nylon 91 kg test	200 m	0.089	17.80

Item No.	Description	Quantity	CIF Price in US\$	
			Unit	Total
85	leader and branch lines = $\emptyset$ 1.4 mm (.055 in) transparent monofilament nylon, 68 kg test	200 m	0.058	11.60
86	leader = gauge 16 soft galvanized tied wire	4.5 kg	2.00	9.00
87	leads = 3.5 kg sounding lead	10	7.00	70.00
	2.5 kg " "	10	6.00	60.00
	1.0 kg " "	5	4.00	20.00
88	hooks = Mustad 39960ST tuna circle No. 6	200	0.148	29.60
	" " " " No. 7	400	0.128	51.20
	" " " " No. 8	200	0.120	24.00

(8) Complete material for 20 Z type fish traps
(2 entrances) with spares

89	mesh wire = mesh size 25 mm (1 in) wire gauge 18, roll 45 m long, 1.52 m wide	7	171.60	1 201.20
90	tie wire = 18 gauge	5 kg	2.12	10.60
91	zinc anode = 225 g	20	0.90	18.00
92	markerline = $\emptyset$ 6 mm (1/4 in) 3 strands twisted black PE rope	2 000 m	0.100	200.00
93	marker buoys = polystyrene floats, white round ball shape, $\emptyset$ 30 cm (12 in)	50	2.46	123.00

(9) Complete material for 20 Norway lobster
traps with spares

94	armature = $\emptyset$ 5.0 galvanized wire	16 kg	2.50	40.00
95	webbing = multifilament PA tarred twine R 1333 Tex (210/48), 38 mm stretched meshes (1.5 in) 200 meshes deep, 200 meshes long	8 kg	8.04	64.32
96	twine = PA tarred R 1333 tex (210/48)	2 kg	7.24	14.48
97	rings = plastic $\emptyset$ 8 mm, inside $\emptyset$ 100 mm	20	1.00	20.00
98	main line = $\emptyset$ 6 mm (1/4 in) 3 strands black PE rope 1 000 m		0.10	100.00
99	marker lines = $\emptyset$ 6 mm (1/4 in) black PE rope 1 400 m		0.10	140.00

(10) Complete material for 40 shrimp traps with spares

100	armature $\emptyset$ 5.0 galvanized wire	40 kg	2.50	100.00
101	tie wire = 18 gauge	5 kg	2.12	10.60

Item No.	Description	Quantity	CIF Price in US\$	
			Unit	Total
102	zinc anode = 225 G	20	0.90	18.00
103	mesh wire = mesh size 12 mm (1/2 in) wire gauge 18, roll 45 m long, 1.52 m wide	3	171.60	514.80
104	main line = Ø 6 mm (1/4 in) 3 strands black PE rope 1 000 m		0.10	100.00
105	marker lines = Ø 6 mm (1/4 in) 3 strands black PE rope 2 000 m		0.10	200.00
(11) Complete material for 300 hooks 15 000 m long long-line with spares for big and medium size pelagic species				
106	main line = Ø 4.70 mm (3/16 in) extra hard lay nylon line 18 000 m		0.091	1 638.00
107	drop line = Ø 4.70 mm (3/16 in) extra hard lay nylon line 4 500 m		0.091	409.50
108	hook line = Ø 1.2 mm (3/64 in) 7 x 7 preformed stainless steel cable 122 kg test 900 m		0.276	248.40
109	cable connectors for Ø 1.2 mm (3/64 in) cable 750		0.108	81.00
110	hook line = Ø 1.9 mm (.075 in) transparent monofilament nylon, 136 kg test 900 m		0.097	87.30
111	snap-on connectors for Ø 4.70 mm (3/16 in) main line with 8/0 swivel 350		0.70	245.00
112	hooks = mustad tuna 9202 B - 7/0 450		0.60	270.00
113	marker buoy line = Ø 6.35 mm (1/4 in) 3 strands twisted black PE rope 600 m		0.053	31.80
114	floats = inflatable PVC fluorescent red buoys Ø 40 cm (16 in) 30		26.82	804.60
115	flag buoys = Ø 40 cm (16 in) PVC inflatable fluorescent red spar buoy Ø 3.8 cm (1.5 in) hole 6		32.00	192.00
116	floats = polystyrene floats, white round ball shape Ø 30 cm (12 in) 50		2.46	123.00
117	baskets = Ø 50 cm x 38 cm (19 in x 15 in) 20		12.00	240.00
(12) Complete material for 10 vertical long-lines with spares, 10 hooks each for big and medium size pelagic species				
118	main line = Ø 4.7 mm (No. 16) 3 strands tarred nylon trawl line 700 m		0.103	72.10

Item No.	Description	Quantity	CIF Price in US\$	
			Unit	Total
119	connecting line = Ø 4.7 mm (No. 16) 3 strands tarred nylon trawl line	600 m	0.103	61.80
120	branch line = Ø 1.8 mm (0.71 in) monofilament nylon, 113 kg test	200 m	0.095	19.00
121	hooks = Mustad 3407SS No. 11/0	200	0.293	58.60
122	three ways swivel No. 5/0	150	0.122	18.30
123	marker buoys = polystyrene floats, white round ball shape, Ø 30 cm (12 in)	25	2.46	61.50
124	baskets = Ø 50 cm x 38 cm (19 x 15 in)	2	12.00	24.00
(13) Complete material with spares for surface and mid-water hand-lines and pole and line for <u>medium and big size pelagic species</u>				
125	main lines = No. 60 braided PA seine twine Ø 3 mm (.119 in)	500 m	0.064	32.00
126	leaders = Ø 1.6 mm (.063 in) transparent monofila- ment nylon, 91 kg test	300 m	0.089	26.70
127	leaders = Ø 1.0 mm (.039 in) transparent monofila- ment nylon, 36 kg test	300 m	0.058	17.40
128	poles = bamboo 4.00 m, Ø 5.0 cm	20	2.00	40.00
129	hooks = Mustad 7692 No. 10	50	0.50	25.00
	" " No. 14	50	0.90	45.00
130	gloves - white nylon, medium, dozen	2	14.00	28.00
(14) Complete material for 10 anchored attraction and concentration rafts				
131	anchoring lines = Ø 4.7 mm (3/16 in) 3 strand black PE line	6 000 m	0.061	366.00
Estimated total CIF price				<u>33 205 05</u> =====

4. Total Cost Estimate in US\$

(a) <u>Gross Cost</u>	<u>Duration</u>	<u>Cost US\$</u>
(1) <u>Shore Personnel and Infrastructure</u>		
- 1 Programme Leader	18	- 1/
- 1 Programme Assistant	12	12 000 ^{2/}
- 1 Pick-up truck	12	10 000
- 1 Storeroom for fishing gear	12	2 400
(2) <u>Sea-going Personnel</u>		
- 1 Masterfisherman	12	60 000 ^{3/}
- 4 Fishermen	12	24 000 ^{4/}
Fishermen's insurance = 10% salary		2 400
(3) <u>Boat Equipment and Gear</u>		
- 1 13 m boat, 100 hp, complete with electronic and deck equipment according to Section No. 2 of this Annex	12	113 500
- Fishing gear according to Section No. 3 of this annex		33 205
- Making of the fishing gear = 10% of value		3 320
(4) <u>Consumable Items, Maintenance and Insurance</u>		
- Fuel: 250 sea-days x 300 l x US\$ 0.20		15 000
- Gasoline		2 000 ^{4/}
- Lub-oil, 10% fuel		1 500
- Ice = 150 t x US\$ 50		7 500
- Food = 250 sea-days x 5 x US\$ 3		3 750
- Boat maintenance 5% value		5 675
- Gear maintenance, man power = 10% value		3 320
- Pick-up truck maintenance = 10% value		1 000
- Boat insurance = 10% value		11 350
- Pick-up truck insurance = 10% value		1 000
(5) <u>Travel and Miscellaneous</u>		
- 4 trips by the WECAF Fishing Technologist from Panama with 30 days travel allowance		3 000
- Reporting and miscellaneous		3 000
Total Cost Estimate		<u><u>318 920</u></u>

-
- 1/ This Team Leader will be an actual staff member of the Government and will remain on the Government's pay-roll. He will be recruited when project funds are made available.
- 2/ The Programme Assistant will be the ships husband and accountant. His salary is estimated.
- 3/ The masterfisherman is recruited on an FAO basis, and the sum given covers all expenses including travel, insurance, pension, etc.
- 4/ These costs are estimates.

(b) Estimate Production Value

During the programme certain quantities of fish will be caught and sold. On the basis of 5 t a month at US\$ 2 500 per t, which seems a possible goal by exploiting the pelagic species, the programme would produce US\$ 150 000.

(c) Residual Value

The boat will normally last ten years, the pick-up truck three and the fishing gear one and a half years. This means that, at the end of the programme, the following residual values would exist:

<u>Fishing gear:</u>	<u>US\$ 33 205 x 6 months</u>	
	18 months	US\$ 11 067.99
<u>Pick-up truck:</u>	<u>US\$ 10 000 x 24 months</u>	
	36 months	US\$ 6 666.66
<u>Boat:</u>	<u>US\$ 113 500 x 108 months</u>	
	120 months	US\$ 102 149.99
	Total Residual Value	US\$ <u>119 884.64</u>

(d) Estimated Net Cost

The net cost of the programme would be then approximately the following:

- Gross cost		318 920.00
- Production value	150 000.00	
- Residual value	119 884.64	<u>269 884.64</u>
	Estimated net cost in US\$	<u>49 035.36</u>

5. Preliminary Timetable

It is highly advisable to carry out this programme simultaneously with the Aruba programme for reasons of logistics and economy, more particularly as concerns the participation of the WECAF Fishing Technologist. The timetable is similar to the one of Aruba (Section 5 of Annex 1).

6. Preliminary Plan of Operation

(a) Exploratory and Experimental Fishing

The objectives of this exercise are given in Section 5 of the Programme.

(1) The first activity

It is carried out during 45 sea-days and according to the same general patterns as for Aruba (Section 6 (a) of Annex 1).

Trips No. 1 to 8

- Sea time: 24 days
- Area: Continental shelf and drop-off
- Interval: 50-300 m
- Distribution system: techniques (i) to (x) (Section 5 (a) of the programme) are used together in clusters distributed at intervals of approximately 15 km along the Curaçao and Bonaire drop-off; techniques (xiii) and (xiv) are used in the same way but at intervals of 25 km; techniques (vi) (vii) and (xvi) are used between the previously mentioned operations.

<u>Day Work</u>	<u>No. of Days</u>	<u>Total No. of Stations</u>
(i) 6 nets of 120 m	15	90
(iii) 2 lines of 100 hooks		30
(iv) 2 lines of 10 hooks		30
(v) 3 lines of 20 hooks		45
(ix) 7 operations of 0.5 hour each		105
(x) 10 traps	9	150
(vi) and (vii) between stations		-
(xiii) 2 lines of 100 hours		18
(xiv) 2 lines of 10 hooks		18
(xvi) operations on fish sightings		-
(vi) and (vii) between stations		-

Trips No. 9 to 15

- Sea time: 21 days
- Area: Mid-slopes
- Interval: 300-500 m
- Distribution system: techniques (iii) to (v) are used in clusters and rather regularly distributed among the 12 squares, 75 km² each covering the given area in Curaçao and Bonaire; techniques (xiii) and (xiv) are also worked in clusters and at intervals of about 28 km around both islands; techniques (vi) (vii) and (xvi) are used between the previously mentioned operations.

<u>Day Work</u>	<u>No. of Days</u>	<u>Total No. of Stations</u>
(iii) 4 lines of 100 hooks	12	48
(v) 3 lines of 20 hooks		36
(xi) 20 traps		240
(xii) 40 traps		280
(vi) and (vii) between stations	9	-
(xiii) 2 lines of 100 hooks		28
(xiv) 2 lines of 10 hooks		18
(xvi) operations on fish sightings		-
(vi) and (vii) between stations		-

(2) The second activity

It is carried out for 21 sea days and follows the same general pattern as the first activity (Section 6 (a) (1) of this Annex) but with less density. Its main purpose is in reality to establish the seasonal variations of the resource. The sea time is divided between 7 trips of 3 days each which is utilized in the following way:

Trips No. 1 to 4

- Sea time: 12 days
- Area: Continental shelf and drop-off
- Interval: 50-300 m
- Distribution system: same as for the first activity (Section 6 (a) (1) of this Annex) but with half less density.

<u>Day Work</u>	<u>No. of Days</u>	<u>Total No. of Stations</u>
(i) 6 nets of 120 m	6	36
(iii) 2 lines of 100 hooks		12
(iv) 2 lines of 10 hooks		12
(v) 3 lines of 20 hooks		18
(ix) 7 operations of 0.5 hours each		42
(x) 10 traps	6	60
(vi) and (vii) between stations		-
(xiii) 2 lines of 100 hooks		12
(iv) 2 lines of 10 hooks		12
(v) operations on fish sightings		-
(vi) and (vii) between stations		-

Trips No. 5 to 7

- Sea time: 9 days
- Area: Mid-slopes
- Interval: 300-500 m
- Distribution system: same as for the first activity (Section 6 (a) (1) of this Annex) but with proportional decrease of intensity.

<u>Day Work</u>	<u>No. of Days</u>	<u>Total No. of Stations</u>
(iii) 4 lines of 100 hooks	3	12
(v) 3 lines of 20 hooks		9
(xi) 20 traps		60
(xii) 40 traps	6	120
(vi) and (vii) between stations		-
(xiii) 2 lines of 100 hooks		12
(xiv) 2 lines of 10 hooks		12
(xvi) operations on fish sightings		-
(vi) and (vii) between stations		-

(b) Commercial Demonstration Fishing

Exactly the same rules as for the Aruba Programme apply here (Section 6 (b) of Annex 1).

Off-shore Water Programme

1. Selection of the Techniques

This programme considers the exploitation of the waters located within the southern Netherlands Antilles' EEZ. These waters have an approximate surface of 66 000 km². Their farthest limits are located at some 183 mi from Curaçao. Such a situation requires boats with good seagoing capabilities. However, due to the relatively limited extent of water and then to the proportionally limited resources, no important investment can be expected and the fishing unit have thus to be rather small. In any event, the sophistication, price and operational cost of the boats put them in the industrial category, and this is an important point which should be kept in mind at the moment of any decision making.

2. The Boat

Approximate price CIF Netherlands Antilles in US\$

- 18 m fibreglass boat with wheelhouse rear of centre, 200 hp diesel engine, 3 kw auxiliary plant, 20 m ³ fish hold with ice 10 m ³ life bait tank with alternative use as fish hold, 5 m ³ freezing storage for bait accommodation for 10-15 days range at 10 knots, 2 echo-sounders 1 radar, 1 direction finder, 1 radio, safety equipment, sails etc.	US\$ 200 000
- long-line and net hydraulic hauler with long-line drum	<u>20 000</u>
Total estimated cost	US\$ <u><u>220 000</u></u>

3. The Gear

(i) 7 000 m of various gill-nets	50 000
(vi) and (xv) trolling gear	2 000
(vii) jigging lines	500
(xiii) 40 000 m 1 000 hooks long-line	12 000
(xiv) vertical long-lines	500
(xvi) life bait fishing gear	<u>1 000</u>
Total estimated cost	US\$ <u><u>66 000</u></u>

4. Total Cost Estimate in US\$

(a) <u>Gross Cost</u>	<u>Duration</u>	<u>Cost US\$</u>
(1) <u>Shore Personnel and Infrastructure</u>		
- Programme Leader	18	- $\frac{1}{2}$ /
- Programme Assistant	12	12 000 $\frac{2}{4}$ /
- Pick-up truck	12	10 000
- Store r oom for fishing gear	12	2 400
(2) <u>Sea-going Personnel</u>		
- Masterfisherman	12	60 000 $\frac{3}{4}$ /
- 10 fishermen	12	60 000 $\frac{4}{4}$ /
- Fishermen's insurance = 10% salary		6 000
(3) <u>Boat, Equipment and Gear</u>		
- 1 17 m boat as per Section 2 of this Annex	12	220 000
- Fishing gear as per Section 3 of this Annex	12	66 000
- Making of the fishing gear = 10% value		6 600
(4) <u>Consumable Items, Maintenance, Insurance</u>		
- Fuel: 250 sea days x 500 l x US\$ 0.20		25 000
- Bait		10 000
- Gasoline		2 000 $\frac{4}{4}$ /
- Lub-oil: 10% fuel		2 500
- Ice: 300 t x US\$ 50		15 000 $\frac{4}{4}$ /
- Food: 250 sea days x 11 x US\$ 3		8 250
- Boat maintenance: 5% value		11 000
- Gear maintenance, manpower: 10% value		6 600
- Pick-up truck maintenance: 10% value		1 000
- Boat insurance: 10% value		22 000
- Pick-up truck insurance: 10% value		1 000
(5) <u>Trips and Miscellaneous</u>		
- 4 trips by the WECAF Fishing Technologist from Panama with 30 days travel allowance		3 000
- Reporting and miscellaneous		3 000
Total Cost Estimate		<u>553 350</u>

- 1/ This team leader will be an actual staff member of the Government and will remain on the Government's payroll. He will be recruited when project funds are made available.
- 2/ The programme assistant will be the ship's husband and accountant. His salary is estimated.
- 3/ The masterfisherman is recruited on a FAO basis, the amount given covers all expenses including travel, insurance, pension, etc.
- 4/ These costs are estimates.

(b) Estimated Production Value

During the programme certain quantities of fish will be caught and sold. On the basis of 8 t at US\$ 2 500 per t, which seems a possible goal according to the actual Venezuelan catches in the area, the programme would produce US\$ 240 000.

(c) Residual Value

The boat will normally last ten years, the pick-up truck three years and the fishing gear one and a half years. This means that at the end of the programme the following residual values would exist:

<u>Fishing gear</u>	<u>US\$ 66 000 x 6 months</u> 18 months	US\$ 21 999.99
<u>Pick-up truck</u>	<u>US\$ 10 000 x 24 months</u> 36 months	6 666.66
<u>Boat</u>	<u>US\$ 22 000 x 108 months</u> 120 months	<u>197 999.99</u>
Total Residual Value		US\$ <u>226 666.64</u> =====

(d) Estimated Net Cost

The net cost of the programme would be then approximately the following:

- Gross cost		US\$ 553 350.00
- Production value	US\$ 240 000.00	
- Residual value	226 666.64	<u>466 666.64</u>
Estimated Net Cost		US\$ <u>86 683.36</u> =====

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