

**Artisanal Fisheries in the  
Netherlands Antilles:  
Fishery Development Planning**

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The Netherlands Antilles consist of two geographically separate island groups: the Windward Islands, St. Martin (Dutch part), Saba and St. Eustatius in the northeastern part of the Caribbean, and Aruba, Curacao and Bonaire in the southern part of the area. Production has been estimated at about 850 mt/yr for Curacao, 770 for Aruba, 80 for Bonaire and about 30 t each for Saba and St. Eustatius. Imports are probably around 2500 t/yr (all fish products including canned shellfish, etc.). Presently, the fisheries of the Netherlands Antilles are entirely of the artisanal type; three entirely different fishery situations exist.

The Aruba Fishery.--Aruba is situated on the South American continental plateau (Fig.1). The artisanal fisheries around this island are primarily demersal fisheries. Catches consist mostly of snappers and groupers and coastal pelagics such as barracuda, wahoo and jacks. The truly pelagic species such as tunas, marlin and rainbow runner avoid the plateau; these seem to pass north of the island and usually move in a westerly direction.

Most fishing is done with bottom handlines, but trolling lines are also used. Fish traps are only rarely utilized. Open boats with an overall length of 5 to about 8 m usually are powered by two outboard motors (2 x 15 up to 2 x 30 hp). All fish are sold directly on the local market, and most of it is sold directly on the beach or to the local hotels. Flake or crushed ice is not available.

The Curacao and Bonaire Fishery.--The islands of Curacao and Bonaire have very narrow coastal shelves (Fig. 1). Consequently, these islands have primarily pelagic fisheries. Small open boats with a length of 4 to about 5.5 m driven by outboard motors of 6 to 25 hp fish along the coast. Most fishing is done with bottom and trolled handlines. Some fish traps are used. In addition to the small boats, a fleet of larger trolling vessels has developed. These locally built vessels have a very typical Curacao design. The hulls are round-bottomed. The vessels are usually 7-10 m long and are powered by inboard diesels (70-120 hp). Nowadays, the vessels are almost always covered with two layers of fiberglass; epoxy paint is used inside.

These pelagic trolling vessels probably account for about 80% of all catches. The tunas (yellowfin and blackfin) and wahoo are the dominant species; dolphin, billfishes, rainbow runner and flying fishes are also very important.

Demersal species probably constitute about 10-15% of the catches. Most of these are caught by the smaller open boats.

Catches are sold at the fishing harbors and beaches and at the Curacao Central Market. At this market cold storage facilities and flake ice are available. Fishing vessels cannot, however, obtain flake ice for use at sea.

The Windward Islands Fishery.--In this area, Saba bank has the largest potential (Fig. 2). From Saba there is a fishery on the northern and northwestern parts of the bank; these parts of the Saba bank are reported to be safe from ciguatoxin. Catches are exported to St. Martin. Flake ice is not available. The northeastern part of the bank is reported to harbor ciguatoxic fish in the area called Copper Bank. Copper Bank itself is a small tongue-like area projecting eastward from the main bank. Even small fish in this area are reported to be toxic. It might be that only the Copper Bank area proper is poisonous (several fishermen expressed this opinion), but since nobody wants to take any chances, the whole area is given a wide berth. For this reason the limits of the poisonous area are not clearly defined. Since good, safer fishing grounds are nearby, the logic of this reasoning is clear. It is not known how far south the poisonous area extends. However, the area south of the 17° 20' parallel is again considered safe.

In St. Eustatius (Statia) most fishing is done around the island (Fig. 2). With very calm weather, excursions are sometimes made to the southeastern part of the Saba bank, but on a yearly base the total fish take from the Saba bank area is almost nil. Most fishing is done with handlines and fish pots. Some catches are exported to St. Croix. Flake ice is not available. Artisanal fisheries in St. Martin, which is situated on the Anguilla Bank, are concentrated on the French side of the island. The economy on the Dutch part is wholly tourism oriented.

Fishery Development Planning (General Considerations).--The fishery development strategy in the Netherlands Antilles aims to develop small demonstration projects which should then form the nucleus for further development. This conclusion was reached when the results of the 1967-68 FAO/UNDP fisheries project, in which the Netherlands Antilles also participated, were evaluated. One of the problems with the 1967-68 regional project has been that it was primarily set up as a resource survey utilizing multipurpose vessels which would then fish the whole region and train crewmen from different countries. Although the data obtained from these projects were certainly valuable, one of the disadvantages of this approach has been that once the vessels left, all the new developments left with them. The newly trained crewmen were not in a position to make use of their new knowledge and the cruise reports were simply filed.

For these reasons, it is felt that it would be better to start with small, permanent fisheries projects, introducing new methods and somewhat larger, more modern ships. Three different demonstration projects are envisaged, each geared to the specific needs of each area and its fishery. The demonstration projects will include fishery research and training of fishermen. A detailed description of these can be found in the

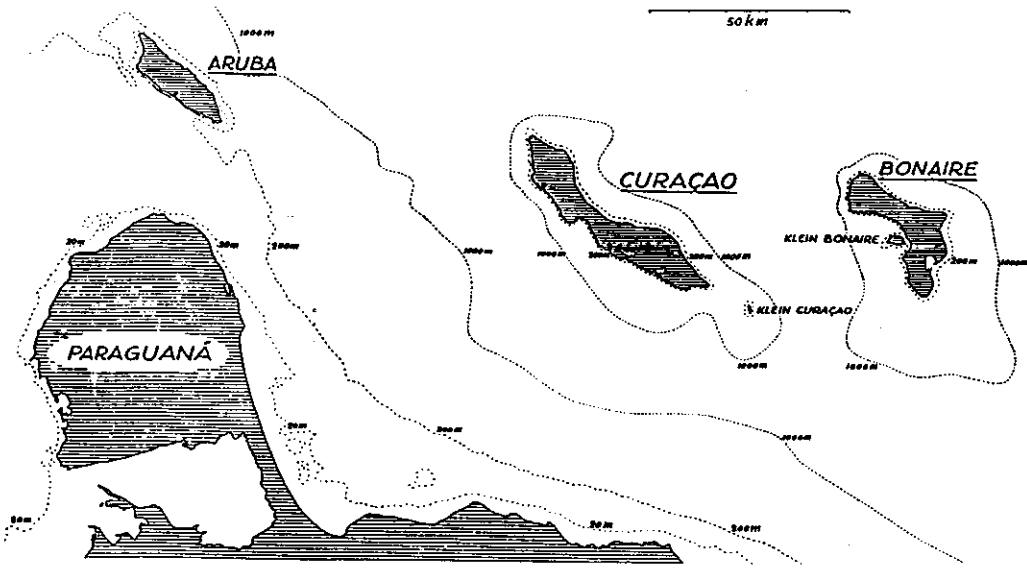


Figure 1. The Netherlands Antilles of the Leeward Group and the Paraguaná Peninsula of Venezuela (Contour intervals in meters).

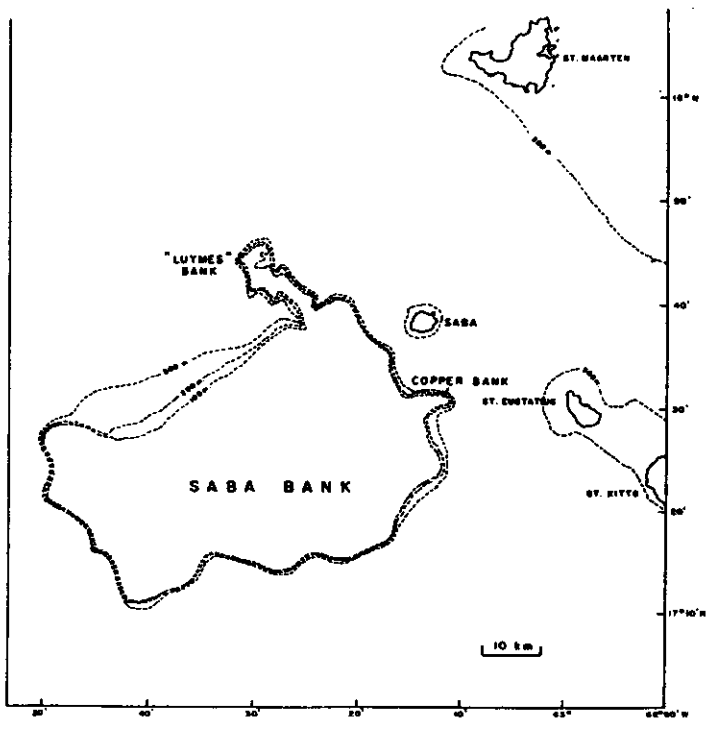


Figure 2. Chart of Saba Bank area.

FAO/WEFAP reports Nos. 32, 33 and 39.

Extension Services and Expert Input.--For each project, a masterfisherman will be needed for at least a 1-year period. The fishery research will be fairly diverse and many different fishing methods will be tested.

Recruitment of a qualified person for this type of work is difficult and expensive. Nowadays, the FAO rate for a masterfisherman is about \$80,000 US for 1 year. This amount is clearly excessive. For our Saba bank project, the cost of a fully equipped 11 m fiberglass vessel will be approximately the same amount as the masterfisherman. The project will be financed by the new Antillean Development Bank which will purchase two boats, the fishing gear and pay the masterfisherman. The Central Government will set up a building and a concrete slipway. The bank has objected to the high cost of the masterfisherman which would have accounted for about 25% of the bank loan and for which no collateral would be available. All other parties involved agreed and it was decided to explore alternatives and not to recruit a masterfisherman via FAO.

Another important point is that one masterfisherman cannot possibly possess all the skills needed to conduct a broad program nor is it advisable to have to work in a vacuum. A regional pool with people to back him up would be needed. These expert input and extension services should be provided on a regional basis. The now defunct WECAP project left a void in this area. The WECAP project has been very helpful and the discontinuation of the project has certainly been felt.

Transfer of Fishing Technology.--The training of fishermen will take place in their surroundings and will demonstrate the results that can be obtained with improved fishing gear and methods. Once the advantages and possibilities are seen, there will be an incentive to learn. This idea of "direct transfer of fishing technology" is not new, of course. It should, however, be realized that the success of this method is dependent upon obtaining better results with the new methods. Even though it might be probable that a given new method will be successful in a certain area, it cannot automatically be assumed that this will be the case. Unexpected problems often will present themselves. There should be more emphasis on the adaptation and development of appropriate fishing gear technology.

I will illustrate this with the following example. During a program for the development of fisheries on Bonaire, it turned out that multiple trolling systems were not superior to the traditional system of trolling with three or four lines only. This unexpected finding is probably a result of the clarity of the waters around Bonaire. New echosounders gave nice results and important data were collected. Nevertheless, catches were not improved, since the fish observed were too deep to be caught with trolling lines. The available bottom lines could not be used effectively either because of the current and excessive drift of the vessel. Curved snapper hooks which are supposed to be self-hooking and which are used throughout the Caribbean were tested and the results obtained were markedly inferior compared

to the locally used hooks with straight shanks. A gill net which was tested in clear oceanic waters fouled up with blue-green algae. In short, the fancily equipped demonstration vessel did not manage to outfish the local fishermen.

Those who had taken a skeptical attitude were vindicated. General opinion on the island holds that the traditional methods are best for this area and cannot be improved upon. This view has now gained strength. New developments are viewed with a sympathetic, pitying smile and seen as yet another example of government sponsored waste of money and effort. Although there is always the nagging and unsettling possibility that the people who hold this view might be right, many methods which could be successful remain to be tested. In my opinion, one of the lessons to be learned from this experience is that the introduction of new technology has been overestimated. It would have been nice to have had a second opinion from an experienced fishing technologist on some of these matters. Since the WECAF project had already been terminated, this could not be arranged.

Development Has to be a Long-Term Effort.--Another lesson is that the development of artisanal fisheries has to be a long-term effort for which long-term financial support has to be secured. For example, when the Bonaire program which had been set up and planned with WECAF help was executed, the WECAF assistance was not available anymore. The development of horticulture in Curacao offers an interesting parallel. A marked increase in production has taken place in recent years. Only a few years ago most people would express the opinion that horticulture would be an impossibility on a dry island like Curacao. Several projects that had failed would be mentioned and it was argued that the money spent on these ventures could have better been used for tourist development or infrastructural projects.

Nowadays, after a few more successful projects, which introduced new methods, this attitude has dissipated and a more positive view of events is gradually emerging. This has only become possible as a result of a long-term effort gradually building on previous experience. A long-term approach will have the added advantage of supplying the outside experts with the opportunity to learn from their mistakes. Too often many people who plan and develop projects do not get the opportunity to participate when these projects are finally executed. Even careful planning cannot avoid all mistakes and it is by analyzing mistakes that we gain understanding.

Managing Developmental Projects.--I will now provide some observations on the organization of the developmental projects themselves. Of course, these will not apply to all situations, but anybody who is trying to set up a fisheries project might find them helpful.

Allow Generous Time for Delivery of Materials.--It is not excessive to allow for at least a 4-6 month period for the arrival of your orders. Although normally goods will probably arrive much earlier, things can, will, and do go wrong. For

example, your letter of credit might be delayed in the mail, it might be sent to the wrong bank, the vessel can be delayed, there will probably be delays while checking through customs, the supplier might decide not to ship unless he has filled the whole order so you will have to wait for him to back order. Once your letter of credit is out, your money is committed and you cannot turn elsewhere. Imagine what happens to your program, when you are paying your \$80,000 US/yr for a masterfisherman, and the materials arrive a full 4 months later than expected. All of this can, will and did happen.

Provide Sufficient Incentive for the Fisherman and Use some Screening Method.--One of the main questions always is, "How will boats be made available to the fisherman?" In Bonaire, a sort of lease purchase system has been used and for the Saba bank program a similar system has been proposed. After a screening period of about a year, during which the fisherman rents the boat, the fisherman can be offered the opportunity to purchase the vessel. Normally, the catch is used as payment; one third is for the fisherman, one third is for maintenance of the vessel and fuel, and one third for the owner of the vessel, which in this case is a government-owned company. When the lease purchase contract is made, the third part, which would have been the fisherman's rent, is simply converted into payment for the vessel. The screening period enables us to select the serious fishermen and weed out the undesirable elements, while applying objective criteria. The purchase contract can be revoked if the fisherman does not comply with the terms of the contract. In such a case, he will receive a partial refund which will vary according to the circumstances. At the end of the lease, part of the rent paid during the screening period may be considered as payment for purchase, thus adding a sort of bonus. This system is workable. There are two disadvantages. The fisherman will always claim to have caught less than he did, thus reducing the share he has to surrender.

The screening period enables one to get rid of the worst offenders. When rent or purchase of a vessel is denied, this will, of course, nearly always lead to angry reactions by the fisherman involved. Intimidation of other candidates interested in the vessel, and even sabotage may occur. These sorts of unpleasant incidents are almost inevitable with any program, but with good management, this sort of difficulty can easily be surmounted. If the decisions taken are just, the community will accept them. Even with the serious fishermen some cheating will always occur, but since this will only extend the pay-back period, it is not too much of a problem as long as the maintenance needs of the vessel are met.

Another disadvantage is that the system cannot be applied to larger vessels which require a larger crew and a higher investment. Such a vessel cannot be made available to one person with this system. Other organizational forms will have to be used. Past experiences with cooperatives have not been good. It is not clear why some cooperatives fail and other succeed. In order to avoid the problems associated with cooperatives and retain the lease-purchase model, the vessels have to be kept as

small as possible. Sometimes this strategy will conflict with the technical requirements imposed by methods which might favor a slightly larger and thus more expensive vessel. This dilemma has not yet been solved. The best approach might be to set up a government-owned company and gradually convert it into a cooperative by selling shares to the fishermen. I believe that it would be easier to set up such a structure on the smaller islands of Statia and Saba than on the larger islands. I also believe that setting up cooperatives and developing artisanal fisheries both have their problems and that it would probably be best not to tackle both at the same time if it can be avoided.

Keep Marketing and Shore Facility Overhead as Low as Possible.--When planning such projects, there is always a temptation to project the organizational structure of a larger organization on what in fact is a very small scale operation. The shore facility overhead costs should be kept as low as possible.

#### SUMMARY

Development of artisanal fisheries can be achieved through the establishment of small permanent projects which are geared to the specific needs of each area and its fishery. Extension services and expert input should be provided on a regional basis at reasonable cost. Adaptation and development of appropriate fishing gear technology should receive special attention. To develop these fisheries a long-term approach is needed.

Who will provide the extension service? The original WECAP project was meant to fulfill these functions. The project has been hampered and was eventually discontinued as a result of lack of funding; even so, the project has managed to lay the foundations and indicate the way to further fisheries development. A similar project with only minor changes, such as a more long-term approach and more emphasis on fishing technology, is still needed.