



MAC DONALD, S. KITLV / MAC & FIELD In assignment of WWF-NL

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# POLICY BRIEF

CREATING EFFECTIVE, SUSTAINABLE FISHERIES MANAGEMENT IN THE CARIBBEAN NETHERLANDS



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# INTRODUCTION

Throughout the Caribbean, like in the rest of the world, the abundance of marine fish species have been declining over the past decades. The health and abundance of fish stocks depend not only on fishing pressure but also on the quality of the marine ecosystems. In the Caribbean Netherlands, coral reefs and the open ocean are the main ecosystems in which the species targeted by the fisheries sector occur. Coral reefs are marine biodiversity hotspots that are not only invaluable for coastal protection but also have a high economic value through associated fisheries and tourism. As healthy fish stocks are essential for the existence of fisheries, concentrating efforts towards more sustainable fishery practices, will not only benefit ecosystems, but also fishermen and other users that contribute to the local economy such as dive tourism. Hence, proper management of the fisheries sector is important for the existence of the profession and for ensuring food security, and also for other sectors which are vital to the economy of the islands. Moreover fisheries plays a very important role when it comes to culture and identity of inhabitants of the Caribbean. As a recreational activity it is a vital source of wellbeing. Hence, it is not only food and dollars that make fisheries an activity to manage well.

As opposed to historical fisheries management in the Caribbean Netherlands, sustainable fisheries management must be a joint effort by the local government, national government, nature NGOs, fishermen and buyers. In addition, adequate enforcement must be in place. Truly sustainable fisheries management requires an active and adaptive approach to the conservation of areas and species, a focus on communication, education and awareness, active research and monitoring, and interaction with stakeholders. Additionally, it requires an integrated approach to address serious anthropogenic threats such as pollution, the introduction of invasive species and climate change, as well as addressing the need for the rehabilitation of degraded ecosystems.

Although fisheries management in the Caribbean Netherlands has improved dramatically compared to 10 years ago, many fish stocks are still declining. To make fisheries management more collaborative and sustainable WWF believes that external factors influencing fish stocks should be taken into account. If not, there is a high chance that commercial fish stocks in the Caribbean Netherlands will decline even further to the point where they are no longer economically viable and will be replaced by lower trophic species. This is already happening in the Caribbean Netherlands and is a prelude to ecosystem collapse as seen on other islands in the region, where fisheries management is in an even much poorer state than on the Dutch islands. Lessons should be learnt from places like Jamaica, where badly managed artisanal fishing played a big role in the collapse of the local coral reef ecosystem.

# GOAL OF THE CURRENT POLICY BRIEF

Being aware of the challenges faced by the fisheries sector in the Caribbean Netherlands, both ecologically, socially and institutionally, WWF-NL conducted a series of studies to gain practical insights in these challenges. The aim was to draw up a suggested course of action to strengthen and improve the current fisheries management practices on the three islands. These studies are currently being finalized but due to the review deadline for the sustainable fisheries plan of the ministry of Agriculture, Nature and Food Safety, WWF-NL decided to share the preliminary findings through this policy brief. The goal of this policy brief is to provide legislators as well as stakeholders within the fisheries sector with a summary of the key findings obtained from WWF-NL's fisheries research with the aim to translate these findings into fisheries policy and management. If these recommendations are followed, we are confident that truly sustainable fisheries can be achieved in the Caribbean Netherlands. Of note is that scientific references, details on study findings and other additional information can be found in the associated study reports that will be published in the course of the upcoming few months.

## OVERALL KEY FINDINGS

**Urgency:** Currently the fisheries sectors of the Caribbean Netherlands are not being managed adequately. The sector is not transparent, most targeted or commercial fish stocks are either over exploited or fully exploited and dwindling. And a lot of fishermen are not able to meet their domestic and family needs. However, there is potential to turn this situation around. This would require an investment in time, support, collaboration with all stakeholders and an investment in human resources and capital.

**Responsibility:** The Ministry of Agriculture, Nature and Food safety ultimately is responsible for fisheries management. This is not limited to having up to date legislation and policy. It is also the minister's responsibility to ensure that implementation and enforcement of legislation and policy takes place. This requires that the implementing partners (public entities, park authorities, The Dutch Caribbean Coast Guard, police, fishermen themselves, etc.), which do not necessarily fall under the direct responsibility of the ministry, have sufficient resources, skills and support to fulfil their tasks. Given the small scale and limited availability of resources on the islands it is therefore advisable to share the responsibility amongst different stakeholders. This ensures that 1) There are enough resources, both human and financial; and 2) That there will be support for the policy. This does require that the division of roles are realistic and clear for all involved parties.

**Integral approach:** Collaboration with the different ministries such as the Ministry of the Interior and Kingdom Relations, the Ministry of Justice and Security, the Ministry of Infrastructure and Water Management, the Ministry of Economic Affairs and Climate Policy, the Ministry of Education, Culture and Science and the Ministry Social Affairs and Employment is crucial to ensure an effective governance structure with and within the public entities. Aforementioned ministries all have a relation to the fisheries sector and are needed and able to make the required positive change in the fisheries sector and should therefore be included in policy development and implementation.

**Coherency:** Fisheries management should be in line with national, regional and international fisheries and conservation laws, regulations and recommendations, such as the international guidelines from the Western Central Atlantic Fisheries Commission (WECAFC), FAO Small Scale Fisheries Guidelines, 1995 UN Fish Stocks Agreement, CITES, CMS, etc., the national nature policy plans and island laws and regulations. Sustainable fisheries management should use an internationally recommended ecosystem based approach as well as precautionary approach as its founding principles.

**Inclusiveness:** And last but not least we would like to emphasize that resource management comes down to people management. This means that proper and effective resource management thus not only revolves around legislation, enforcement, monitoring and research. But, more importantly, attention must be paid to the organizations, institutions and individuals assigned with the task to manage the resource. In order to achieve effective management, these entities are required to be well equipped for their executive duties. Even more so, it is of importance that the individuals who are affected directly by the management measures are directly included in the process. This can be done through

co-management in which different actors in fisheries are included in the way management is set up and implemented. . The inclusion of local fishers in the management process appears to be most effective and successful when they are able to organize themselves with clearly defined representatives. This tends to aid the efficiency of the co-management process, communication between parties and tends to result in more uniformity and support among the stakeholders regarding the management measures. The option of exploring the ideas of co-management and the inclusion of fishermen can be initiated by organizing workshops with fishermen on every island to identify shared goals and management strategies. It should also be considered that there are new or non-traditional fishing activities on the islands from Chinese, Latin American or other immigrants, therefore these groups should be included in the management structure as well.

## SUMMARIES OF THE FIVE STUDIES

### HISTORICAL FISHERIES STUDY

#### Research goal:

All across the Caribbean, fish stocks are declining. On several Caribbean islands (pre)historical research into fisheries was done, e.g. Curacao, Jamaica. These studies (references can be found in the study itself) show that:

1. Fish stocks started declining before modern (20th century) monitoring started , therefore baselines used in modern fisheries management might not be representative of a healthy fish stock, and
2. The speed of decline in fish stocks has increased in modern history (1950-present).

WWF-NL seeks to understand if these findings are similar for the Caribbean Netherlands islands. If so, this means that the currently used baselines in fisheries management are not representative of a healthy fish stock and that more effective management of the fisheries sector is needed to avoid following in the footsteps of islands where these management measures were not taken in time.

**Method:** Different types of data were considered for this research. The first are historical sources, which are distributed throughout the world in archives and collections. These can be divided into written documents, old photos/ and prints. The second concerns archaeological data, which provides information about marine species in the diet of pre historic people.

#### Key findings

- Several examples were found that support the hypothesis that human impact has resulted in decline and even extinction of harvested marine species before modern (20th century) data collection started (Turtles, Manatees, Queen Conch, Monk seal);
- Grouper, Snapper, Tuna and small jacks together with shellfish were the main marine food source on Saba and St Eustatius before colonization, indicating their high abundance;
- On Bonaire the main marine food source in prehistoric times was Queen Conch, indicating its high abundance;
- Fishing permits were already in use in the 19th century, it cannot be confirmed that this was done to manage declining fish stocks.

#### Policy recommendations

- The findings in the study do not differ from the outcomes of studies that have been conducted in Curacao (Vermeij et al 2019) or Jamaica (Hardt 2009). It is therefore proposed, in view of existing data gaps for Caribbean Netherlands, to take into account the conclusions and recommendations from these reports when developing fisheries management for Caribbean Netherlands;
- Consider that baselines have shifted. Currently used baselines and policy targets are not likely to reflect a healthy fish stock. It is therefore advised to establish realistic and measurable targets based on healthy fish stocks, taking into account historical data, as limited as they may be;
- Having a good data monitoring system in place ensures adaptive management decisions, identify changes to fish stocks and habitat at an early stage to be able to change management measures.

Comprehensive data collection also allows communication to stakeholders about proposed changes in policy;

- Certain fish groups, such as large groupers, have all but disappeared from the reef and require special attention and species specific measures when developing fisheries policy if these are to be returned to the reef.

## MARKET STUDY

**Research goal:** To see how locally caught seafood travels through the supply chain from fisherman to end consumer. This information will guide recommendations on opportunities within this chain to enhance sustainable practices in the seafood supply chain in the Caribbean Netherlands.

**Method:** Four target groups were interviewed for this study. Namely: consumers, professional fishermen, restaurants/supermarkets and importers/exporters. For each target group, questionnaires were developed aimed at gathering information on their perspective relating to the island's fisheries, seafood supply chain, fish consumption, trade and sustainability. A total of 361 interviews were conducted between June 2018 and May 2019. Interviewers were local residents and staff of WWF-NL. Recreational fishermen were interviewed but are not included in this analysis. Professional fishermen on these islands can all be classified as local, artisanal fishermen.

### Key findings

- Very limited data is available with regards to import/export of seafood;
- Very limited data is available on volumes and species of fish sold locally;
- No data is available on recreational fisheries, both by tourists and by residents while it is estimated that 10-15% of Bonaireans participate in recreational fisheries regularly and there are several tourist charters running daily fishing trips;
- Much of the fish sold on Bonaire is not caught around the island but imported from Aves, which is not known by many consumers therefore suggesting that Bonaire fish stocks are healthier than they actually are;
- To stimulate sustainable practices, supermarkets and restaurants on Bonaire and Saba would consider promotion of local sustainable species, boycott less sustainable species and/or would consider to implement an ecolabel. Boycotting unsustainable species is not a preferred suggestion for sustainability for restaurants and supermarkets on St. Eustatius;
- Consumers on Bonaire and St. Eustatius primarily purchase local fish and seafood directly from the fishermen, hereafter come restaurants and supermarkets. Quality is indicated as the most important purchasing criteria, followed by origin and sustainability. Consumers indicated to be willing to pay more for sustainable species;
- Fisheries operate invisibly on the islands and the supply chain lacks transparency. There are no centrally managed selling points for local fish and seafood. Information provision is very low and consumers are not aware of the origin, capture method and sustainability of the seafood purchased;
  - Consumers do not have enough information to make a sustainable choice
  - Enforcement of illegally imported or prohibited species is impaired
  - Food safety issues cannot be traced to their source
  - No supply information available to inform adaptive management
  - No recognition of the importance of fishermen, nor support from fishermen for management measures
  - Policy, monitoring and enforcement officials are not aware of market drivers and therefore cannot develop adequate fisheries management.
- On Bonaire, fixed governmental pricing of seafood may be causing financial problems for the local fishermen.

**Policy recommendations:**

- In order to create a more transparent fisheries market a comprehensive fisheries management plan, including feedback regulation and fish catch monitoring as well as import/export monitoring should be implemented;
- A sustainability rating should be developed for the locally caught fish species based on similar methodology as used for the Good Fish Guide in The European Netherlands, which may include development of a local sustainability label;
- Several aspects of fisheries management, to be agreed upon by stakeholders, should be incorporated in the nature conservation programs of the national park authorities active on the islands, and these delegated responsibilities should be clearly defined in legislation;
- Fisheries should become more visible through a visibility and awareness campaign;
- An awareness campaign should be launched for consumers/buyers of seafood aiming to help them make the more sustainable seafood choice. This should include argumentation why fisheries are important for the islands in order to leverage support for the sector;
- Consumers need to know where local seafood is sold. They should be able to recognize and distinguish local from imported seafood;
- The fixed government pricing for seafood on Bonaire needs to be evaluated and the prices most probably need to be indexed to comparable prices within the region for fishermen to be able to make a decent living/reasonable income while ensuring increased fishing pressure due to higher market value does not lead to overexploitation of fish stocks;
- Include recreational fisheries in the fisheries management plans in order to understand and regulate this part of the fisheries sector.

## COMMUNICATION & AWARENESS STUDY

**Research goal:** to identify effective ways of communicating about sustainable fisheries to artisanal and recreational fishers in the Caribbean Netherlands.

**Method:** Gather best-practices in fisheries and conservation education programs through a qualitative meta-analysis and interviews with conservation communication experts from the Caribbean Netherlands.

**Key findings:**

- Within communication, the conditions, format and content of the communicative activities have to be aligned with the knowledge and perception of the audience;
- When developing an education program, there are five points of attention: setting the goals, knowing the audience, developing attractive and participative formats, creating relevant and interesting content, involve local people in the organization and integrate the educational activities within other conservation projects;
- To make a fisheries awareness program a success, different types of media and channels should be used to spread and repeat the message and different institutions need to be involved to reach the wider public and ensure program continuity.

### **Policy recommendations:**

- When communicating on sustainable fisheries with artisanal and recreational fisheries, attention has to be paid to the conditions, format and content of the communicative activities. When integrated in a wider program, as in a fisheries awareness program, goals have to be set, the audience has to be studied or known, the format has to be developed in a participative way, content has to be aligned with knowledge and perceptions of audience and the goals of the program, the organization has to be established in such a way that program continuity can be secured and the program has to be integrated with other conservation efforts;
- For communication with fishers, most important is to address the topic of sustainable fisheries from different angles and to not shy away from more technical subjects (e.g. fish reproduction, the effects of certain fishing methods on fish populations);
- Fishers should not only be addressed via fisheries meetings, but also as citizens or community members via other channels;
- Recreational fishers require a specific communication strategy in order to include them in the awareness program;
- As most fishers in the Caribbean Netherlands are not aware of their influence on fish stocks research into effective communication with artisanal and recreational fishers in developing countries is needed, especially on how to discuss sensitive topics like the establishment of marine protected areas and fisheries rules and regulations;
- A fisheries awareness campaign should also show that fisheries management can contribute to economic and social development, using economic and social arguments to explain the benefits of sustainable fisheries;
- A fisheries engagement officer with a strong background in marketing, communication or education should be recruited to set up, implement and monitor awareness and engagement related to fisheries throughout the sector.

## **SOCIAL MAPPING STUDY**

**Central question:** Why is it so difficult to manage the fisheries sector on Bonaire, Saba and St. Eustatius and how should this be tackled in the future in order to have a sustainable fishery sector. Under which circumstances will it be possible to engage fishers in an organized manner in the development of sustainable fisheries?

**Method:** Participatory action research through which the fisheries cooperative PISKABON was established on Bonaire. In addition to in-depth interviews with fisheries stakeholders on Bonaire, Saba and St. Eustatius.

### **Key findings:**

- The identified, interrelated and mutually reinforcing social bottlenecks can be classified in three overarching topics or themes: a skewed division of urgency, unclear or debated roles, responsibilities and resources for management, and insufficient management and governance support. Appendix I presents a complete overview of the identified bottlenecks, their causes and proposed solutions. Please note that this is a simplified summary and that the reality is more nuanced;
- Some form of co-management or shared responsibility with the local fishers to manage the sector can help solve many of the bottlenecks, provided that the management process is inclusive, clear and guided properly;
- Including the fishers in an organized matter (i.e. a fisheries cooperative) in this process is crucial, and requires proper support and guidance;
- Due to the complexity of fisheries management, there is not one optimal interaction approach: the

initiators of, as well as participants in fisheries management processes should decide and negotiate on how much and what kind of interaction is necessary, appropriate and desirable;

- The responsibility for finding an appropriate degree of interaction lies with the initiator of fisheries management. Transparency about the chosen strategies (and limitations) to engage in the interaction processes is the key to reaching consensus about the degree of interaction.

#### **Policy recommendations:**

- On all islands a fisheries cooperative or some form of organization among the fishers must be established, where it is imperative that strong, continuous support is provided to the cooperative or organization. This support cannot be simply imposed on the fishermen, but must be wanted and accepted;
- The fisheries departments of all public entities must be strengthened in terms of knowledge, urgency and capacity. At least one fisheries policy officer and implementation officer per island;
- The urgency among both the local and national government to address and manage the fisheries sector must be enlarged through joint lobbying from NGO's and fishers;
- A systematic stakeholder analysis should be carried out to ensure representative involvement of those stakeholders relevant to the fisheries management question. Clear objectives for the participatory process need to be agreed among stakeholders at the outset. It should be made explicit who are considered stakeholders in the issue at hand, which of these groups can participate and in which form, and who decides on all of this, in short: who is the owner of the participatory process;
- Where relevant stakeholders should be involved as early as possible and throughout the process. The different contexts of departure (i.e. the interests of the different stakeholders) must be shared at the beginning of a participatory process;
- A transdisciplinary, multi-stakeholder, long term, legally binding Fisheries act as well as policy and management plan must be developed by a stakeholder-working group. The Fisheries act should clearly define – in a legally binding way– the roles and responsibilities of all responsible parties in fisheries management. The roles and responsibilities for other actors in the fisheries sector should be clearly defined in policy and management plans;
- To ensure participation continuity, transparency and clarity throughout the development of a fisheries policy and management plan a fisheries engagement officer must be installed. Preferably by the National (and local) government, this can be rolled into the function of fisheries implementation officer if desired;
- A sustainable financial model must be developed for fisheries management for all three islands to prevent the sole reliance on perceived (political) urgency;
- Throughout the development of the management and policy plan, pilot projects must be executed, the communities must be informed through public campaigns and the plans must be evaluated and adapted accordingly.



# CO-MANAGEMENT STUDY

**Central question:** What are the conditions under which a co-management system aimed at inclusive-ness and sustainability can work in the fisheries of the Caribbean Netherlands?

Supported by the subsequent sub-questions:

- What are the global best practices, recommendations and example case studies for fisher involvement in fisheries management?
- What are the considerations for the Caribbean Netherlands with regard to co-management?
- Is a co-management system beneficial in the Caribbean Netherlands context and if so, what model might fit the local situation best and what steps are required to establish this model?

**Method:** Analysis of case studies in and outside the region to compare the conditions for success and failure to the Caribbean Netherlands and a questionnaire distributed among the key fisheries stakeholders in the Caribbean Netherlands.

## Key findings:

- There is a potential to implement co-management strategies in the Caribbean Netherlands with several requirements already being in place. However on each island the majority of principles for co-management principles are currently not met (see appendix II). If the implementation of co-management is desired, several changes are required;
- Motivation and a willingness for co-management has been voiced by fishers on all islands.

## Policy recommendations:

To achieve the changes for which the following is recommended:

- Develop well-defined legislation and management goals: The new management plan should include clearly defined boundaries of fishing territories and clearly defined roles/membership of the fishery. The clarity of these boundaries, roles, and goals sets up a good foundation for any management system;
- Appoint a fisheries officer on each island: A fisheries officer on each island can address the unique needs the fisheries sector of each island, enable strong and continuous communication and mediation between fishers, local and national government representatives and MPA authorities regarding fisheries co-management;
- Install conflict management: conflicts are very much present on all three islands but that there have been few solutions to ongoing conflicts. Major conflicts between and within parties will hinder the success of any management plan. Thus, a conflict management strategy should be implemented. The conflicts on each island vary greatly and should be addressed differently;
- Organize co-management workshops: workshops that include all stakeholders, will allow stakeholders to discuss current management and the implementation of co-management. Workshops should be held on each island and have a minimum of 60% participation of all relevant stakeholders to ensure for the best outcome. Workshops should eventually lead to regular meetings.

## KEY PRINCIPLES OF CO-MANAGEMENT

The road to an effectively managed fisheries sector should lead to co-management. Co-management is a process and can be defined as partnership arrangement between the government and the local community of resource users, sometimes also connected with agents such as NGOs, research institutions, and other resource stakeholders, to share the responsibility and authority for management of a resource (FAO, 2019).

To achieve fisheries co-management, several criteria must be met:

1. The physical boundaries of the area to be managed should clearly defined so that the fishers group can have accurate knowledge of them. The boundaries should also be of a size that allows for management with available technologies and communication.
2. Membership is clearly defined: those with rights to fish in the bounded fishing area and participation in the management should be clearly defined.
3. The involved fisher has a high degree of homogeneity or group cohesion. Local ideology, customs and belief systems create a willingness to deal with collective, commonly understood problems..
4. The fishers have some prior experience with traditional community-based systems and with organizations, where they are representative of all resource users and stakeholders intersected in fisheries management.
5. Most individuals affected by the management arrangements are included in the group that makes and can change the arrangements.
6. Management rules are simple and enforced.
7. The fisher group has the legal right to organize and make arrangements related to its needs
8. There is an incentive and willingness on the part of the fishers to actively participate, with time, effort and money, in fisheries management through a core group or organization.
9. The government has established formal policy or laws for decentralization and delegation of management responsibility to local group organization levels.
10. A coordinating body is established, external to the local group or organization and with representation from the fisher group or organization and government, to monitor the local management arrangement, resolve conflicts and reinforce local rule enforcement.
11. The benefits from participation in and compliance with community-based management exceed the costs of investments
12. Transparent, adequate and fair financing is readily available.

See Appendix 2 for the current presence of the co-management principles the Caribbean Netherlands according to the main fisheries.

Series	Bottleneck / reality	Causes / contributing factors	Solutions
URGENCY	Urgency to manage fisheries < Urgency to manage nature	<p>The government of the Netherlands is directly responsible for the fisheries sector of Bonaire but, the fisheries sector of the Caribbean Netherlands is smaller than the Fisheries sector of the Netherlands.</p> <p>(Binding) international conventions actively stress the threats of climate change and emphasize the urgency to act in terms of nature conservation.</p> <p>Civil servants in the public entity have little affinity with the fisheries sector.</p> <p>NGO's and scientists can actively lobby for environmental protection towards the government. Other environmental issues tend to be prioritized over fisheries management issues</p> <p>Fishers lack knowledge about and experience with formal bureaucratic systems, and are confronted with institutional barriers when trying to advocate for the fisheries sector. There is both a large physical and emotional/cultural distance between fishers and the Government of the Netherlands.</p>	<ul style="list-style-type: none"> <li>Establish a fisheries cooperative by means of highly skilled facilitation</li> <li>Install a fisheries engagement officer</li> <li>Collective lobbying by NGO's &amp; fishers</li> </ul>
	Urgency to manage nature < urgency to invest in development	<p>Bonaire / St. Eustatius: political instability of the disables the public entities to develop well-defined, long term policy, including sustainable fisheries policy.</p> <p>The Caribbean Netherlands depends on a budget ('vrije uitkering') received from the Netherlands to execute their governmental tasks and responsibilities. It has been shown that this budget has a structural deficit (IdeeVersa, 2015), compelling public entities to choose between projects/areas to invest in.</p> <p>Due to the meagre economies and poverty that exists on the islands, the public entities are prone to priorities short-term projects focused around economic development.</p> <p>Fishers are confronted with institutional barriers when trying to advocate for the fisheries sector, due to limited knowledge about and experience with formal bureaucratic system.</p>	<ul style="list-style-type: none"> <li>A fisheries cooperative</li> <li>Install a fisheries engagement officer</li> <li>Collective lobbying by NGO's &amp; fishers</li> <li>Identify Alternative financial investment (i.e. private sector)</li> </ul>
	NGO's have negative reputation within community	<p>Communication from NGO's to fishers and the general community about legislation.</p> <p>Insufficient inclusion of fishermen regarding fisheries management.</p>	<ul style="list-style-type: none"> <li>Clarify roles and responsibilities</li> <li>Install a fisheries engagement officer</li> </ul>
	No fisheries organization / representatives	<p>Fishers feel less urgency to tackle fisheries issues.</p> <p>Fishers are individualists, and not used to working together.</p> <p>Fishers do not have (or make) the time to invest in setting up a fisheries-cooperative.</p> <p>Fishers have limited knowledge about or experience with bureaucratic system/ working methods.</p> <p>Fishers are fearful for reputational damage when joining the board of a fisheries-cooperative / taking the lead.</p> <p>Fishers fear that collaboration can lead to additional negative consequences.</p>	<ul style="list-style-type: none"> <li>Establish a fisheries cooperative by means of highly skilled facilitation</li> <li>Install a fisheries engagement officer</li> </ul>

Series	Bottleneck / reality	Causes / contributing factors	Solutions
ROLES, RESPONSIBILITIES AND RESOURCES	Legislation has gaps / faults / is insufficient	Change in legislation due to constitutional change of 10/10/10. Urgency to protect nature is higher than urgency to manage fisheries. Urgency to protect nature is higher than urgency to manage fisheries.	<ul style="list-style-type: none"> <li>Establish a stakeholder-working group</li> <li>Establish a fisheries cooperative by means of highly skilled facilitation</li> <li>Install a fisheries engagement officer</li> </ul>
	Responsibilities for (daily) management are unclear	Legislation has gaps / is insufficient. Fisheries management requires close collaboration with various governmental departments and other stakeholders. Urgency to protect nature is higher than urgency to manage fisheries: other issues have been more urgent to tackle than fisheries legislation. Urgency to invest in economic development higher than urgency to invest in fisheries sector or nature.	<ul style="list-style-type: none"> <li>Establish a stakeholder-working group</li> <li>Clarify roles and responsibilities</li> <li>Install a fisheries engagement officer</li> </ul>
	Lack of resources: budget & capacity	Urgency to manage fisheries is lower than urgency to manage nature/other sectors. Urgency to invest in development is higher than urgency to manage nature. Responsibilities for management are unclear. Limited budget results in limited capacity: weak governmental departments	<ul style="list-style-type: none"> <li>Identify Alternative financial investment (i.e. private sector)</li> <li>A fisheries engagement officer</li> <li>Collective lobbying by NGO's &amp; fishers</li> </ul>
	Lack of inclusion of fishers	NGO's tend to have a negative reputation within the community. Not having a fisher's representative / fisheries cooperative.	<ul style="list-style-type: none"> <li>A fisheries engagement officer</li> <li>Establish a fisheries cooperative by means of highly skilled facilitation</li> </ul>
	No collective lobbying by fishers	Not having a fisher's representative / fisheries cooperative.	<ul style="list-style-type: none"> <li>Install a fisheries engagement officer</li> <li>Establish a fisheries cooperative by means of highly skilled facilitation</li> </ul>

Series	Bottleneck / reality	Causes / contributing factors	Solutions
MANAGEMENT AND GOVERNANCE SUPPORT	No investment in fisheries sector development	Responsibilities for (daily) fisheries management are unclear.	<ul style="list-style-type: none"> <li>Collective lobbying by NGO's &amp; fishers</li> <li>Identify Alternative financial investment (i.e. private sector)</li> </ul>
		Lack of resources: Budget.	
		Lack of resources: Insufficient capacity within the governmental departments.	
	No fisheries policy or management plan	No investment in fisheries sector: no data monitoring / difficult to decide which measures need to be taken.	<ul style="list-style-type: none"> <li>Install a fisheries engagement officer</li> <li>Collective lobbying by NGO's &amp; fishers</li> </ul>
		Availability of, and agreement about scientific knowledge.	
		Responsibilities for (daily) fisheries management are unclear.	
		Insufficient capacity/budget within the government.	
	No enforcement of legislation	Responsibilities for (daily) management are unclear.	<ul style="list-style-type: none"> <li>Transdisciplinary, multi-stakeholder, long term, legally binding fisheries policy plan and management plan</li> <li>Install a fisheries engagement officer</li> </ul>
		Legislation has gaps and is insufficient.	
		No fisheries policy or management plan.	
		Perceived insufficient communication about legislation to fishers.	
		Affected by psychological factors: reputational concerns.	
	(Perceived) Insufficient communication of legislation	Fisheries has a big cultural value: politicians reluctant to stress enforcement	<ul style="list-style-type: none"> <li>Install a fisheries engagement officer</li> <li>Establish a fisheries cooperative by means of highly skilled facilitation</li> </ul>
		Insufficient capacity/budget within the government.	
	No governance support from fishers	No fisheries cooperation / representative	<ul style="list-style-type: none"> <li>A transdisciplinary, multi-stakeholder, long term, legally binding fisheries policy plan and management plan</li> <li>Establish a fisheries cooperative by means of highly skilled facilitation</li> </ul>
		Perceived insufficient communication about legislation.	
		Perceived insufficient inclusion of fishers (and other stakeholders) in governance actions.	
		No investments in fisheries sector development.	
		Affected by psychological factors, conflict of interest and negative past experiences.	

# APPENDIX 2

Average survey results on stakeholder perspectives on current situation on all three islands of the Caribbean Netherlands. Stakeholders surveyed included government officials, non-government representatives, an independent researcher, and fishers. Answers were given on a scale of 1 to 5, where 1 = strongly disagree, 3 = neutral and 5 = strongly agree.

Statement	Bonaire	St. Eustasius	Saba
There is a resource use problem.	4,3	2,3	3,3
The geographical area of the different fisheries is clearly defined (e.g. pelagic vs bottom fishing. MPA vs non MPA. EEZ vs territorial waters).	2,8	2,5	4,5
The rules and regulations in each managed area are clear.	2,5	2,0	2,8
It is well defined who plays a role in the management of the fishery sector.	2,2	1,3	2,0
There are clear objectives for management.	2,0	1,5	2,3
Fishers and national government work together.	2,3	1,8	3,3
Fishers and local government work together.	1,7	2,3	2,5
Fishers and the MPA management authority work together.	2,7	2,5	2,3
Fishers and government communicate effectively.	1,8	1,5	1,8
The fishing community is encouraged to work with the government.	4,0	1,7	2,3
Leadership exists amongst fishers.	3,0	3,3	2,3
Conflicts amongst fishermen and between parties are resolved quickly.	2,3	2,5	2,8
Authority is shared with fishers.	2,5	4,0	3,0
Fishers can enforce the rules.	2,3	3,8	2,8
Fishers can make the rules.	1,8	2,0	3,3
The fisheries legislation gives ownership of the fishery to the fishers.	1,2	1,8	3,0

Does not meet comanagement precondition

Neutral regarding comanagement precondition

Meets comanagement precondition



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