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SUSTAINABLE FISHERIES MANAGEMENT PROJECT (SFMP)

Shellfish Co-Management: Peer to Peer Study Tour to Western Benin Oyster Communities



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THE
UNIVERSITY
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Cover photo: Study tour participants and organizers from Ghana, Benin and The Gambia at Degoué in Benin. (Credit: Study tour team).

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SNV: <http://www.snvworld.org/en/countries/ghana>

ACRONYMS

CEWEFIA	Central and Western Region Fishmongers Improvement Association
CRC	Coastal Resources Center
DAA	Development Action Association
DFAS	Department of Fisheries and Aquatic Science
DOPA	Densu Oyster Pickers Association
HM	Hen Mpoano
MOFAD	Ministry of Fisheries and Aquaculture Development
NGOs	Non-Governmental Organizations
SFMP	Sustainable Fisheries Management Project
SNV	Netherlands Development Organization
TOWA	TRY Oyster Women's Association, The Gambia
UCC	The University of Cape Coast, Ghana
URI	University of Rhode Island
USAID	United States Agency for International Development

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Figure 1 The coastal zone at Degoué village
(Credit: Perpétue Adité).



Figure 2 A harvested oyster from Degoué, Benin.
(Credit: Perpétue Adité)

1. BACKGROUND

This Shellfish Co-Management Peer to Peer Study Tour to Western Benin Oyster Communities was part of a series of peer to peer capacity development actions facilitated by USAID/Ghana Sustainable Fisheries Management Project (SFMP) to support a women-led participatory fisheries co-management planning process for sustainable management of the Densu River estuary oyster fishery in Ghana in partnership with Development Action Associates (DAA). The Densu estuary co-management planning process is modelled on the participatory, ecosystem-based, rights-based co-management approach implemented in The Gambia by the

TRY Oyster Women's Association (TOWA) and the Department of Fisheries, facilitated by the University of Rhode Island (URI) under the USAID/BaNafaa Project. The Benin study tour built on previous peer to peer capacity development activities organized by SFMP including:

- A [Regional Study Tour on Women's Empowerment and Post-Harvest Improvements](#) for Ghanaian women-led civil society organizations in the fisheries sector to The Gambia and Senegal in January 2016.
- Technical Assistance provided by the TRY Oyster Women's Association (TOWA) of The Gambia to conduct a [Participatory Rural Appraisal of oyster harvesting activities in the Densu River estuary in Ghana](#) in January 2017.
- A Study Tour to the Ada clam site on Lake Volta in 2017.
- A Study Tour from Ghana to The Gambia by two oyster pickers from the Densu Oyster Picker's Association (DOPA) and one DAA staff to visit oyster harvesting communities to learn best practices in good governance and co- management, post-harvest processing and marketing in March 2018.
- Technical Assistance provided by TOWA to DOPA and DAA in May 2018 to follow up on application in the Densu estuary of lessons learned from the March 2018 Gambia Study Tour.

From 2016 – 2018, with this and other support from SFMP, DAA and the Densu River estuary oyster harvesting communities made significant progress on a co-management planning process. They engaged stakeholders, conducted participatory assessments, action research and water quality testing, formed DOPA, developed and drafted a co-management plan that proposes to delegate use-rights, and implemented a pilot five month closed season. Like the Oyster and Cockle Co-management Plan in The Gambia, this effort is among the first to demonstrate concrete application of a participatory, ecosystem-based, rights-based fisheries co-management approach in Ghana. The demonstration and multiplier effects of the process and its outcomes will make an important contribution to sustainable fisheries management in Ghana.

A 2013 International Journal of Development Research article by Dr. Alphonse Adité et al.¹ found that oyster farming is widespread in the Benin coastal zone and provides sustainable revenues for local community members engaged in this activity. More than 2,000 women from 25 villages were involved in the oyster farming at the coastal zone. Annually, each woman stocked and reared about 10,000 to 50,000 juvenile oysters. Oyster farming at the Benin coastal waters generated an annual yield of 30 kg/m² with estimated mean yearly

¹ Adite, A., et al. 2013. The Oyster Farming in the Coastal Ecosystem of Southern Benin (West Africa): Environment, Growth and Contribution to Sustainable Coastal Fisheries Management. International Journal of Development Research, Vol. 3, Issue, 10 .087-094.

revenues of 160,000 CFA (USD\$330) per individual. Habitat disturbances such as the destruction of mangroves, input of anthropogenic contaminants, nutrient enrichment and the hydroelectric dam built on the Mono River were among the major stressors that could affect the traditional oyster farming. These stressors are similar to those present in the Densu River estuary in Ghana. The wetlands where women harvest and cultivate oysters in Western Benin are also, like the Densu estuary in Ghana and the Tanbi wetlands in The Gambia, designated as wetlands of international importance under the RAMSAR convention for the conservation and sustainable use of wetlands.²

A study tour was planned to share and learn from the Benin experience and to continue to expand the community of practice of women oyster harvesters in West Africa in support of place-based sustainable management of the resource and improved livelihoods for resource dependent communities in the Densu River estuary in Ghana. Identifying and implementing effective approaches for improved management in these wetlands of international importance also contributes to national and global objectives for biodiversity conservation, economic growth, food security, good governance and gender equity.

2. PARTICIPANTS

Dr. Alphonse Adité, Zoology Department Head of the Sciences and Technologies Faculty of the University of Abomey-Calavi in Benin, hosted the study tour from May 6 – 10, 2018 in partnership with a Representative of the SFMP Chief of Party and a URI Resource Person. It included 10 participants from Ghana and 3 resource persons from TOWA of The Gambia as follows:

Dora Kuforlor, Oyster Picker, Densu Oyster Pickers Association (DOPA), Ghana.

Patience Amudzi, Oyster Picker, DOPA, Ghana.

Bernice Bebli, Oyster Picker, DOPA, Ghana.

Cecelia Senu – Oyster Picker, DOPA, Ghana.

Mr. Francis Agbeshie, Oyster Picker, DOPA, Ghana.

Francis Amporfo, Sakumo We Family Representation (traditional river chief), Ghana.

Sheila Fynn Korsah, University of Cape Coast, Department of Coastal and Aquatic Sciences.

Andrew Agyekumhene, Forestry Commission, Ghana, Wildlife Division.

Olivia Horvey, Ga South Zonal Officer - Fisheries Commission, Ghana.

Abraham Asare, Development Action Association, Ghana.

Fatou Janha Mboob, Director, TRY Oyster Women's Association (TOWA), The Gambia.

Isatou Jarju, TOWA, The Gambia.

Lamine Saine, TOWA Point of Contact, Department of Parks and Wildlife, The Gambia.

Karen Kent, URI/CRC Resource Person.

Mrs. Sarah Naa Dedei Agbey SNV, representing the USAID/SFMP Chief of Party.

The focus was on a peer to peer approach among women oyster harvesters and farmers. Peer to peer learning for key stakeholders who support women's oyster communities and associations for sustainable management of the resource was also addressed as the study tour brought together Department of Fisheries and Parks and Wildlife agents from the three countries, as well as university researchers from Ghana and Benin. Finally, a representative

² The Western Benin RAMSAR site is listed as, "Basse Vallée du [Couffo](#), Lagune Côtière, Chenal Aho, [Lac Ahémé](#)." https://en.wikipedia.org/wiki/List_of_Ramsar_wetlands_of_international_importance

of the Sakumo lagoon traditional river chief in Ghana accompanied the group. He observed the impact of DOPAs pilot 5 month closed season and wanted to know more about the process and the potential to apply such management measures to the Tilapia fishery in the lagoon. His engagement with participants, including traditional leaders from the oyster communities in Benin, about the role of traditional leaders in sustainable fishery and ecosystem management was important and will facilitate the application of lessons learned in Ghana.

3. OBJECTIVES

Learning objectives of the study tour were to:

1. Increase understanding of oyster resource management and governance systems, best practices, successes and challenges.
2. Understand the oyster value chain in Benin, including post-harvest handling, hygiene, processing and marketing innovations, successes and challenges, especially those that might be relevant for Ghana.
3. Observe and identify mangrove protection and rehabilitation activities and best practices in Benin oyster harvesting areas especially those that might be relevant for Ghana.
4. Increase women's empowerment in fisheries management and peer to peer networking to support sustainable fisheries management best practices in the "Invisible Fishery Project".

Expected outcomes included:

1. Effective practices identified for adaptation and application in Ghana for:
 - Oyster resource management and governance systems
 - Oyster value chain development, including post-harvest handling, hygiene, processing and marketing innovations
 - Mangrove protection and rehabilitation
2. Compelling examples and first-hand accounts from the study tour identified and shared to make the case to DOPA stakeholders and constituencies in Ghana about the importance and urgency of priority best practices. Focus on practices for which consensus has been difficult to achieve or that have been widely acknowledged as necessary but have proven challenging to implement.
3. A stronger shared vision and increasingly effective collaboration among DOPA members themselves, as well as between DOPA and DAA, UCC, the Fisheries Commission, the Forestry Commission, and traditional leaders based on this shared experience.
4. Continued communication between participants in Ghana, The Gambia and Benin to initiate a West Africa community of practice for sustainable oyster management.
5. Action plans to document next steps.

4. THE STUDY TOUR

The study tour departed by road from Accra on May 6, 2018 for a three-day program in Western Benin. The group lodged in Ouidah and returned to Accra on May 10th. A map of the coastal region of Western Benin indicating the locations visited and a photo gallery are included in Annex to this report. Highlights of each day are summarized below, while key

discussion points and lessons learned from all three days are consolidated and summarized by theme in Section 5.

4.1 Day One – The Durbar

Local women welcomed the study tour team with a song at Degoué - a local community situated on the coastal lagoon near Ouidah. The song ushered the DOPA team to the Chief's palace for a meeting with the Chief of the community and his deputies. After the greeting, Mr. Francis Amporfo, of the Ghana delegation, reciprocated the gesture by extending felicitations from the Chief of the Sakumo lagoon in Ghana. The Chief of Degoué has formally sanctioned access to the lagoon to citizens to engage in fishing to improve their livelihoods. The Chief reiterated his readiness to collaborate and welcomed the team to share experiences with the people of Degoué on how to sustainably manage the lagoon and its resources. Following a presentation by the group from Ghana, the Chief thanked the team and stated that he was looking forward to more effective collaborations with sister countries like Ghana.

More than 100 women from 11 villages along the Western Benin coastal lagoon, Lake Aheme and Lake Nokoue welcomed the study tour team to the durbar grounds. A list of participants is included in Annex. All generations, including elders, youth and children were also present throughout the two-days of the program in Degoué. Following songs and introductions, the Ghana and The Gambia teams and the Benin communities made presentations on their oyster harvesting, management and value chain activities. An open discussion and information sharing session then provided a forum for the three countries (Benin, Ghana and The Gambia), to give insights on their oyster activities, respond to each other's questions and reflect on effective practices.

4.1.1 The Gambia

Fatou Janha, Director of the TRY Oyster Women's Association in The Gambia, gave a general picture of how TOWA brought together women oyster harvesters previously working in isolation in their own communities, how community and national level groups were formed and their challenges. She said The Gambia has 15 villages coming together and over 600 women in the association working together on oysters. She highlighted how The Gambia women also visited and learned from women oyster harvesters and farmers in Senegal during the development of their association, stressing the importance of peer to peer learning such as this study tour. She informed the gathering that the oyster women in The Gambia were happy to be working as an association because it has increased mutual understanding among the women themselves, as well as between the women and their communities and the general public about the value of the work they are doing and its' difficulties. As a result, they are working together, making more money and taking care of their children and families. Fatou admonished participants to work together if they want to see rapid results. She said, "Together we stand, divided we fall." She also asked the women and communities present not to wait for Government to come, but to do things for themselves. She indicated that in The Gambia, the oyster women take care of the environment and the mangroves. Government cares, but cannot take care of the environment and mangroves for them. She asked the women to work with their elders, their children and politicians to protect the environment, mangroves and their oyster trade, not waiting for a project to come, but on their own initiative.

4.1.2 Ghana

Bernice Bebli of the Densu Oyster Pickers' Association made the Ghana presentation and learned that she could speak directly to Benin participants in Ewe. She indicated that women

oyster harvesters in Ghana did not understand the actual and potential economic value of oysters until they organized themselves to take the trade seriously. She said DOPA was made up of 250 women and they are currently learning from the women in The Gambia. She highlighted positive efforts DOPA is now taking to correct mismanagement of the environment and the mangroves to sustain the oyster business. She spoke about the five month closed season on oyster harvesting recently piloted by DOPA in the Densu estuary, its impacts on community members and the benefits they are realizing in terms of larger oysters, increased revenue and recognition of the positive role of women oyster harvesters as environmental stewards. Bernice ended by saying that all represented at this gathering should unite in promoting the sustainably managed oyster business.

Mr. Francis Amporfo, who represented the Sakumo river Chief in Ghana, made a brief presentation on behalf of Numoo Ogbamey III. He advised the women to take sustainable oyster management seriously so they will in turn have sustainable revenue to care for themselves and their families. He mentioned to the leaders in Degoué that in Ghana the elders were responsible for protecting and sustaining the lagoon. He advised the elders in Degoué to do the same by enforcing rules and regulations. He advised the men and elders to take and show interest in protecting the lagoon for the women and for posterity.

4.2.3 Benin

The Vice President of the oyster group in Degoué, Noelle Dosu, presented their activities. She explained that their operations involved group culture of oysters for the association plus individual farms. She informed the gathering that their association for oyster production was formed two months ago and the association included only two men. She explained that the oysters they produce are brought as juveniles/spat from other places, like Avlo, and transplanted and grown in the lagoon in Degoué. During a period of approximately 2 weeks, they bring the juvenile oysters and spread them to prevent accumulation in one place. They harvest after one year using hired labor. The juveniles do not survive when there is too much rain, which happened a few years ago, resulting in a total loss. She asked the team from The Gambia and Ghana to share available knowledge and technology on nourishment and growth of juveniles to improve production. Other challenges she highlighted include ongoing conflict with fisher folk who are not supposed to spread their nets in the designated places (marked by sticks) where the oysters grow. They are seeking to resolve the situation amicably and hope to learn how The Gambia and Ghana communities have addressed this issue. She said, in Benin, the oyster shells are used to pave the ground and that organizations producing animal feed buy the shells as an ingredient. She informed the gathering on their alternative sources of livelihood, such as selling fish and salt production, when oyster production is not in season. She also explained that oysters are sold in the regular market. There are no special oyster markets.

Women from Lakes Aheme and Nokoue shared with the group how they harvest oysters directly from mangroves in some of their areas. They described how they also make fish traps/brush parks called “Akaja” (similar to “Atija” in Ghana’s Densu estuary) to attract and harvest fish. After the fish harvest, they allow additional time before benefitting from a harvest of oysters from the Akaja. They noted that when water levels are high, oyster production is not good.

4.2 Day Two – Visit to Degoué Community

The study tour group returned to the Degoué community on the second day for practical sessions and field visits with the oyster women. This included:

- Discussion of mangrove degradation its causes, its impacts and experience of the groups with actions taken to protect and restore mangroves.
- A canoe trip on the lagoon to witness a demonstration of juvenile oyster planting.
- Sampling of the lagoon’s salinity by the DOPA team using instruments they brought.
- Discussion of water quality, sanitation and hygiene conditions in the lagoon where oysters are grown.
- Demonstration and in depth discussion of the Benin communities’ practices for each of the post-harvest steps of shucking, cleaning, measuring marketing and various methods for cooking harvested oysters.

The Benin groups shared that they have been inspired by The Gambia and Ghana teams to strengthen their associations and unify around their common interests and challenges. Benin will establish a National Association to work on oysters. The interim Board nominated to promote the work on sustainable livelihoods of women’s oyster communities through sustainable oyster production was presented. The Board is comprised of;

1. President: Dossou Noellie (Degoué).
2. 1st Vice President: Houngbo Sossi (Houakpe).
3. 2nd Vice President: Tohouegnon Benoit (Djegbadji).
4. Secretary – General: Koudoda Josephine (Meko).
5. Secretary – General (deputy): Noumon Ayaba (Avlo).
6. First Treasurer: Kougbla Philomina (Aido).
7. Second Treasurer: Agbogba Avlessi (Seyigbe).
8. Organizer: Sahossi Michel (Degoué).
9. Deputy Organizer: Essoe Homorine (Djondji).
10. Superintendent: Aideou Beatrice (Agbanto).
11. Deputy Superintendent: Gbedohonta Nadeige (Zogbo).

Fatou Janha, Director of TOWA in The Gambia cautioned the Benin participants to ensure that they take care to reach out and engage all community members to understand the benefits community members in general and oyster producers specifically hope to realize from the association and their roles and responsibilities and contribution to it. She stressed the importance of a participatory development of by-laws that will institutionalize good governance practices, including regular renewal and rotation of elected representatives and officers.

The study tour team also took the opportunity to learn about the alternative livelihood of salt production that is common in the Ouidah area, including at Degoué and in the village of Djegbadji. Salt from this area is known for its’ unique quality and is marketed based on its’ place of origin. A description of the process is documented in the photo gallery in Annex. It is very different from the solar evaporation pond method used in Ghana.

4.3 Day Three – Visit to Avlo and Wrap-Up Session

The team visited Avlo village in the Grand-Popo region to better understand the source of juvenile oysters used by oyster producers in communities like Degoué where they are transplanted for grow out. The team met with the chief of Avlo and representatives of the women involved in oyster activities there. The visit was brief due to the time it took to get to Avlo, which was accessed by boat. The discussion raised many questions about factors that have influenced the ecology of the coastal lagoon in this area and the dynamics of the oyster value chain among communities in Western Benin over the years. Realizing that such factors

are in play was an important learning point. Understanding the issues in-depth is a longer term endeavor.

The chief informed the team that Avlo had large oysters before establishment of the Mono River dam in the late 1980s, which has affected water salinity and oyster size. There is no comprehensive scientific research done to measure the impact of the dam on oyster development. Dr. Adité noted that such studies should be planned going forward. Community members explained that oyster picking was traditionally an important livelihood, but in recent times the benefits have reduced considerably. The team learned that the market for production and sale of juveniles to Degoué oyster producers was due to a project that ended some years ago and that it was thought that Degoué producers were accessing credit from financial institutions to engage in oyster production. Avlo no longer sells juveniles to Degoué but produce oysters themselves. Degoué seems to be getting juveniles from another area closer to the mouth of the lagoon.

A final debrief and wrap up session with study tour participants, representatives from each of the participating oyster producing communities, and invited guests was held on the final afternoon in Ouidah. Representatives from the Benin Department of Fisheries, USAID/Benin and the Ouidah City Mayor's office participated in this session as follows:

- Daouda ALIOU, Assistant, Benin Department of Fisheries
- Geoffrey Minott, General Development Officer, USAID/Benin
- Bruno ADJOVI, 1st Mayor Associate, Office of the Ouidah City Mayor

The Associate Mayor, representing the Mayor---who happens to be a woman---thanked the team for their initiative and encouraged the Benin women to work in an association. Noting that in Benin the women oyster producers tend to work individually, he said, "If you come to the town council as an individual it is hard for us to help you. If you come as an association with issues and proposals that are priorities of your member communities, we can more easily support you." The Department of Fisheries representative encouraged the women oyster producers to be persistent. He emphasized the importance of recognizing that working in an association is not like working as paid labor, reminding participants that when you own the activity you benefit from it, you don't need to be paid. The speakers hoped that the Benin group would continue to grow as an association and that networking with Ghana and The Gambia would facilitate their development.

The next section summarizes lessons learned over the 3 days and key points from the debrief session by theme.

5. LESSONS LEARNED

5.1 Oyster Co-Management Associations

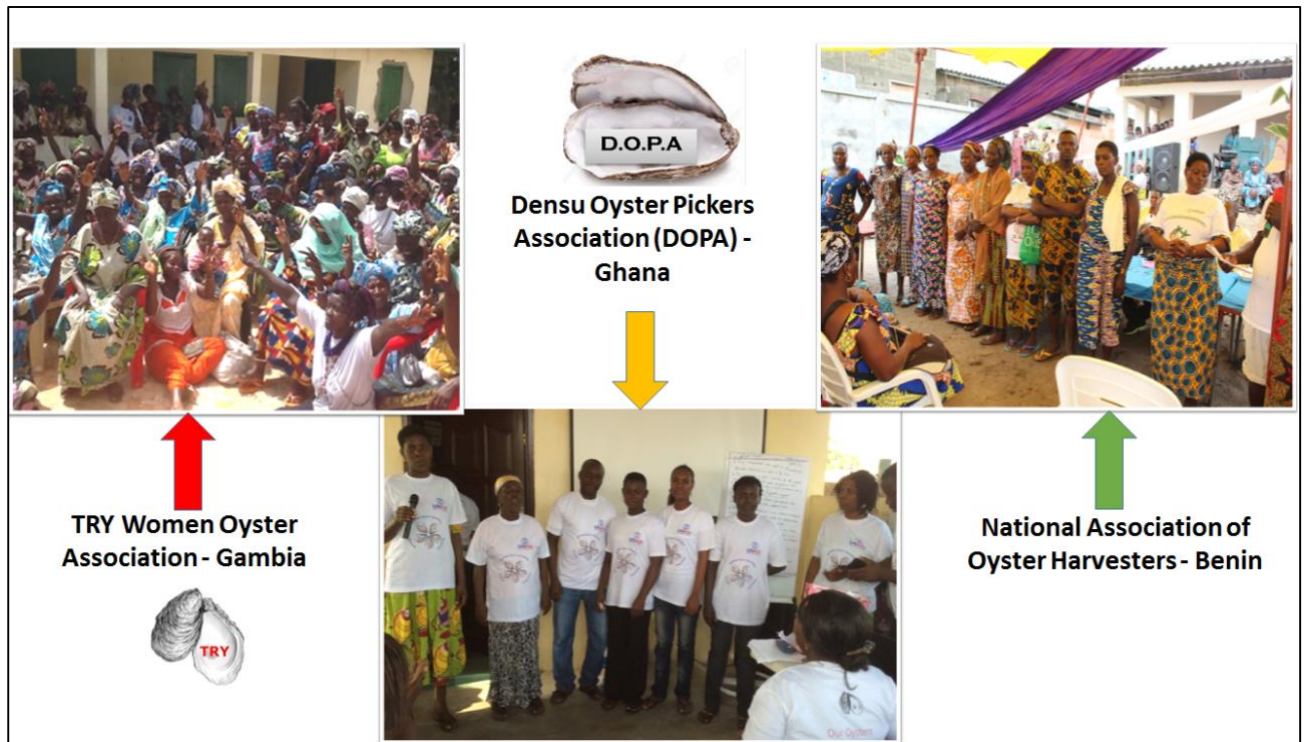


Figure 3 Oyster co-management associations

For women oyster producers/harvesters who traditionally work individually in their own village settings, realizing the value of forming associations to link producers/harvesters locally and nationally to achieve shared objectives is a learning and engagement process that can take time, persistence and strong leadership.

Effective practices shared:

Initiate joint activities that build mutual understanding and trust and address common problems. These included, exchange visits, participatory research facilitated by local researchers to share local knowledge and test ideas for improving oyster production, harvest festivals, etc. In Benin, frequent flooding was a problem that could not be addressed individually and convinced oyster producers to start working as a group, even though many women were discouraged by high oyster mortality.

Conduct an open, transparent, and inclusive process that has repeated cycles of outreach over time to inform and identify all interested actors, enables them to be welcomed, their perspectives to be heard and their concerns to be addressed. DOPA is the result of this ongoing process initiated two years ago in Ghana. TOWA was formed in The Gambia in 2007, but the process is continuous even after a decade. In Benin, it is just beginning.

Try a step by step approach, working first in one or two communities to demonstrate the expectations and benefits of association. Other communities are more willing to join after observing the results.

Ensure that women lead and own the process. The experience of Ghana and The Gambia has been that, as the principal oyster producers, women are in the best position to steward sustainable management of the resource, their own livelihoods, and benefits for the broader

community, even if some men engage in the activity. Leadership training and coaching has helped women leaders in The Gambia and Ghana assume leadership roles and lead effectively.

5.2 Oyster Co-Management

The Gambia	Ghana	Benin
		
	 	<ul style="list-style-type: none"> • SPAT TRANSPLANT • 12 – MONTH GROW-OUT • DEMARCATIION OF INDIVIDUAL PLOTS (Using Sticks) • BAN OF MANGROVE CUTTING

Figure 4 Oyster co-management

Organized women resource users, given recognition, legal authority and capacity development support, can effectively design and implement measures to sustainably manage oyster resources, improve livelihoods and protect coastal wetlands, especially where existing initiatives are not succeeding due to lack of government capacity and resource limitations.

Effective practices shared:

Take initiative, show results. Organize, build consensus, design and pilot management measures rather than wait for government to act. Show resource users, the public, and government the benefits of these actions. Tell government actors, your “elected followers,” how they can best provide support. In The Gambia, TOWA began implementing management measures such as, an 8 month closed season, a minimum size for harvested oysters, a ban on cutting mangrove roots to harvest oysters, and requirement to use a tool that reduces root damage, even before they were granted exclusive use rights and management responsibility for the oyster and cockle fishery in the Tanbi Wetlands in a gazetted co-management plan that legalizes such measures. In Ghana, DOPA has already piloted a 5 month closed season while finalizing their co-management plan and waiting for government approval. In Degoué in Benin, women are creating designated areas for oyster beds in the lagoon that are protected year round for the 12- month growth cycle based on permission from traditional leadership. In all three cases, larger oysters and a better market price have been the result.

Seek formal recognition and legal authority for resource users to have a decision-making role in management of the resource. TOWA has been formally granted use rights in a Co-Management Plan signed by 5 government agencies at the national level since 2012. DOPA

is proposing a similar delegation of rights in their draft Co-Management Plan. The Benin Fisheries Act, recently revised, seems to provide the legal basis for such delegation of co-management rights and responsibilities.

5.3 Oyster Culture

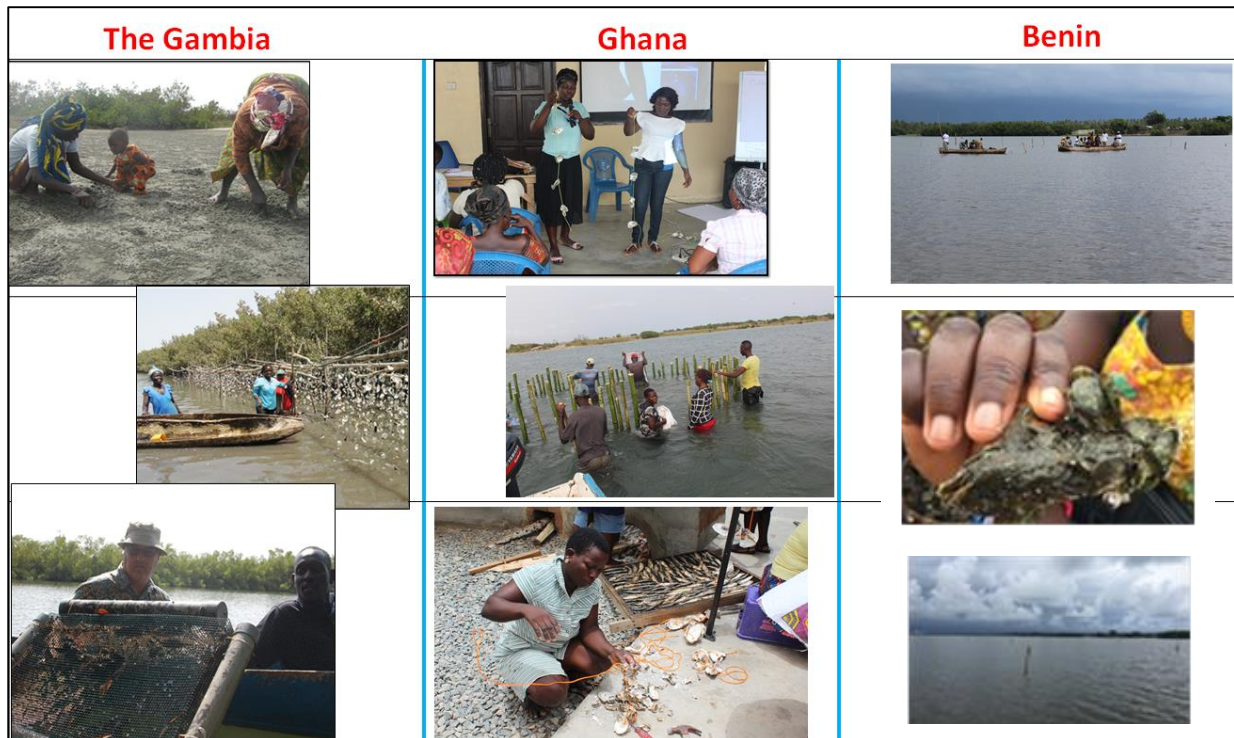


Figure 5 Oyster culture

Sustainable management and harvest of wild oysters is the least cost, highest return production improvement that can be implemented where wild oyster populations exist in Ghana, The Gambia and Benin. Oyster culture can potentially increase and expand production, but it depends on wild populations for juveniles and can require financial resources for inputs.

Effective practices shared:

Redistribution of wild spat and juvenile oysters from zones of high density to zones of low or no density favorable for growth expanded the total area under oyster production and the number of active producers in Degoué in Benin, where both collective and individual plots are maintained. In The Gambia, redistribution of cockles from one area to an adjacent area in the same community is practiced and will soon be expanded to redistribute from one community to other communities.

Creation of additional nodes in the oyster value chain. The oyster culture practice in Benin creates a production value chain that does not exist in Ghana or The Gambia, with source communities selling or bartering spat and juveniles to communities that specialize in grow-out of the oysters to market size.

Rack culture using empty shells as substrate has been piloted and scaled up by TOWA in The Gambia. Challenges include, cost of inputs, finding a sustainable and durable source of wood for the racks, and regular labor input needed to keep racks maintained and oysters free of algae. Benefits include, safer and shorter travel distances in the wetlands, a higher quality oyster due to less clumping, and reduced stress on mangroves. Cost/benefit of the rack

production is not yet well established. The pilot stage resulted in a shift from collective to individual rack farms due to disputes over tracking of equal labor for equal benefit sharing. DOPA is piloting rack culture in Ghana copied from The Gambia. More technical assistance is needed to implement it properly and wild harvest is plentiful enough, especially as new management measures are put in place, that the investment does not seem economically viable at this time.

5.4 Mangrove and Habitat Stewardship

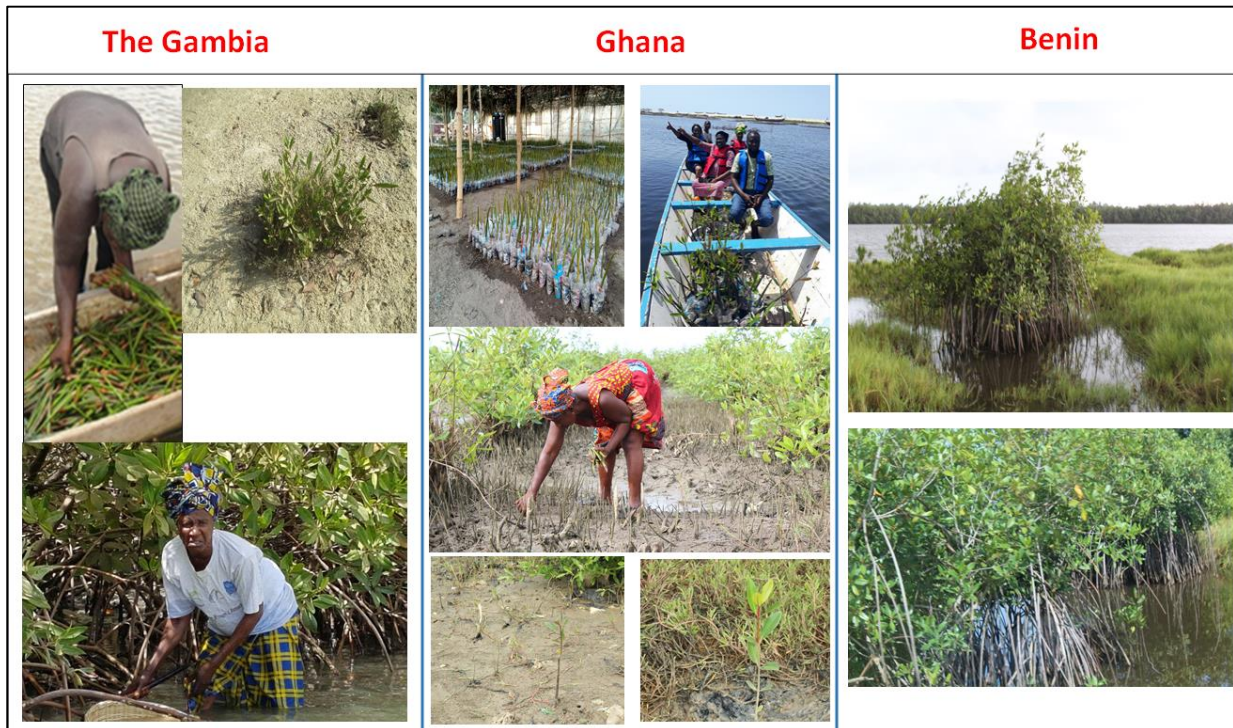


Figure 6 Mangrove and Habitat Stewardship

Sustainable management of the oyster fishery by women can be an effective entry point and incentive for restoration and conservation of mangrove wetlands, creating a win-win scenario for oyster producers, communities and governments. This is especially true where pressure on the resource is increasing and resources for monitoring and enforcement are limited.

Effective practices shared:

Recognize and raise awareness that the abundance and sustainability of oysters and many other fisheries is directly linked to the health of mangrove ecosystems. Like in Ghana, the mangroves in Degoué are severely degraded due to cutting for fuel and roof construction, assembling of Akaja/fish traps, and to make more space for fishermen to throw their nets. Community members believe that mangroves attract mosquitos and cut them to reduce the threat of malaria. Like in Ghana’s Densu estuary, changes in water flow throughout Benin’s coastal wetlands and lagoons due to hydroelectric dam construction (from 1984-87 on the Mono River and in 1974 for the Weijja Dam in Ghana) have dramatically altered environmental conditions affecting mangrove survival and growth. As a result of these pressures, Degoué has seen increasing incidents of severe flooding in their village and the lagoon is silting up, “It used to be too deep, now we can walk all the way across only reaching up to our waist!” They have also seen fish populations decline, “We used to catch fish in the mangroves with our bare hands. Nothing like that is possible today.”

Restore and protect. Mangrove cutting is banned in these sites in all three countries, but it is not well enforced. The focus should be on voluntary compliance and social pressure by community members who link their wellbeing and livelihoods to healthy mangroves. The Gambia has had success with mangrove restoration conducted mainly by gathering propagules in the wild for replanting in degraded areas through community mobilization on a volunteer basis. Fatou of TOWA feels very strongly about not paying community members for replanting out of concern for sustainability and because they themselves are the beneficiaries. Planting events include a meal that everyone contributes to. In Ghana, significant and regular replanting of degraded areas in the Densu is underway using seedlings grown in nurseries.

5.5 Water Quality



Figure 7 Water quality

Improved sanitation and hygiene of the water bodies where oysters grow is essential to produce oysters that are healthy for human consumption and have added market value.

Effective practices shared:

Find alternative sites or technologies for latrines emptying into water bodies or within 30 meters of the water body where oysters are grown. Degoué communities find this issue challenging because they host festivals for large numbers of visitors who use the latrines. The Gambia corrected this issue by moving latrines. They also got project support at some sites to build latrines with sealed pits that are pumped and emptied elsewhere when full. User fees collected and managed by the TOWA community groups pay for maintenance. Water quality testing for fecal coliforms showed an improvement following this change.

Remove rubbish and take action to improve rubbish disposal practices. Rubbish pollutes and chokes the flow of water in the mangroves and is a factor for the generation of mosquitoes. The sites in all three countries are challenged by this issue. The Degoué Chief's spokesman acknowledged the seriousness of the problem in their lagoons. Not developing

structures within 50m to 100m of the water body helps to prevent pollution. Engaging local authorities is also important. National “cleaning days” and a ban on single use plastic bags are measures the government of The Gambia has taken to address the rubbish problem.

Test and document water quality consistently over time to understand trends and demonstrate the safety of oysters harvested from the waters for human consumption. TOWA had project support and a partnership with the government water testing laboratory to conduct 3 years of water quality testing at oyster harvesting sites. UCC has trained DOPA members to conduct standard water quality tests themselves with equipment provided by SFMP.

5.6 Harvesting

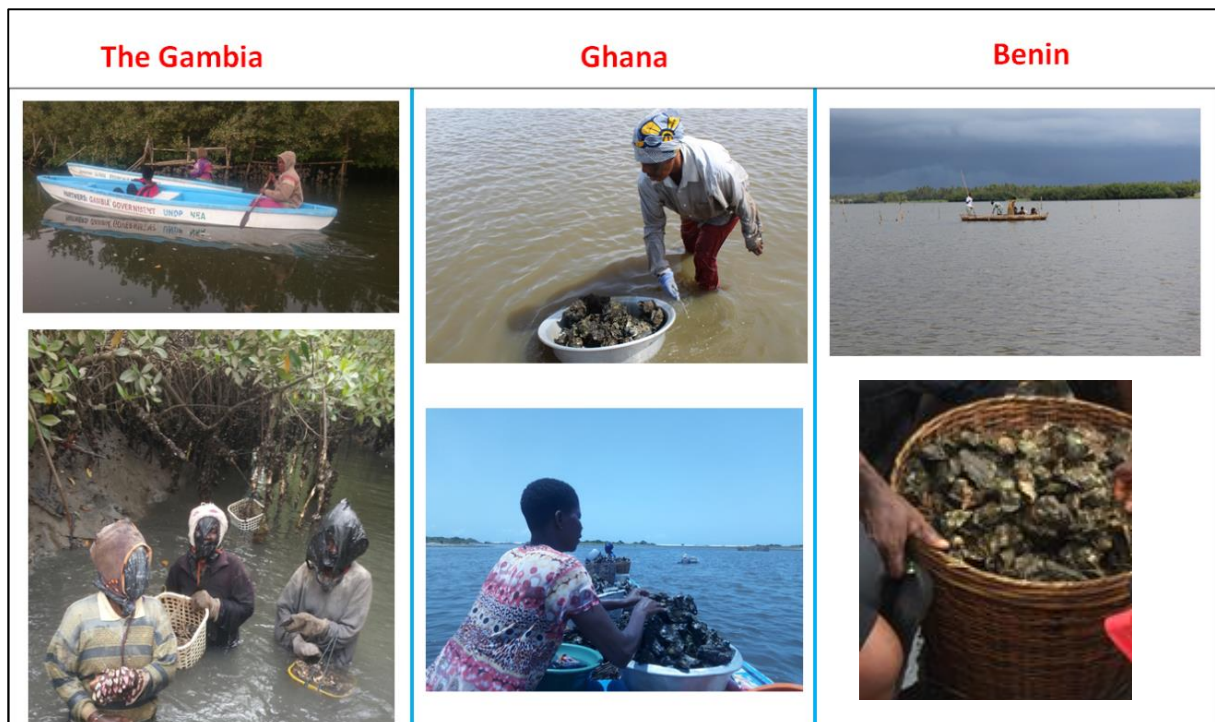


Figure 8 Harvesting

Controlling the length of the oyster growth cycle before harvest has been the simplest, quickest, and most effective method for increasing size, abundance and market price in all three countries.

Effective practices shared:

Closed seasons of 5 months in Ghana’s Densu estuary and 8 months in The Gambia have resulted in larger oysters that bring higher market prices.

A 12-month growth cycle is practiced in Degoué in Benin, which harvests the largest oysters of all.

Maintaining and reversing degradation of the wetland ecosystems that support oyster growth is required to sustain the positive impact of longer growth cycles as a management measure.

Improving working conditions and safety for women harvesters has helped offset the hardship of fewer harvest cycles. Footwear, life jackets, and a communications alert system using cell phones are measures undertaken in The Gambia and Ghana during harvest operations in tidal areas.

5.7 Processing



Figure 9 Processing

Processing improvements can create many opportunities for increasing oyster quality, price, potential for year round sales, and potential for a diversity of revenue streams.

Effective practices shared:

Shucking oysters live as practiced in Benin, rather than by boiling to open them as practiced in Ghana and The Gambia, has multiple benefits for product quality and for oyster production. Saving the juveniles stuck to the mature oyster shells to be thrown back for further grow out is one benefit. Producing a grit free oyster by washing the fresh oyster meat multiple times before cooking is another. In Benin the fresh oyster is washed at least 4 times. Grit in the product brought to market is one of Ghana's key challenges to making oysters a more sought after delicacy.

Collecting and selling or using the "oyster water" that surrounds the oyster in the shell for its' reputed therapeutic value to reduce goiter, bloated stomach, and hair loss, promote healthy skin, and improve erectile dysfunction and sperm count, among other uses.

Smoking, pickling, vacuum packing, freezing, frying, and boiling are processing methods used in the three countries.

Hygienic handling during processing is critical. This includes, hand washing, gloves, clean clothing, covered hair, working off the ground, protecting the product from flies during handling, maintaining hygienic conditions at the processing site (excluding animals, potable water availability, covered work area, etc.). TOWA motivates members to adopt hygienic handling practices by giving those who consistently apply them preference for participation in new opportunities.

5.8 Marketing



Figure 10 Marketing

Development of consumer demand and higher market value for oysters creates incentive for producers and other actors in the value chain to take the steps necessary to manage the resource sustainably.

Effective practices shared:

A vertically integrated value chain in The Gambia and Ghana, where the women harvesters also process and sell their own oysters at the retail level, enables them to benefit directly from improvements made anywhere in the value chain.

A system of specialized value chain actors in Benin creates potential for market expansion and growth, but may be less reliable in delivering better financial returns (incentives) at the producer level as a result of sustainable resource management and other value chain improvements. In Benin, sale of juvenile oysters is done by one group of actors, production to market size is done by another, casual labor is hired for harvesting, frying and boiling may also be done by producers, marketers selling at the retail level purchase fresh or cooked product from producers.

Associations like DOPA and TOWA can play a strong role in creating market demand by helping producers to bring consistent high quality, volume and regularity of supply to higher value consumer markets, while also ensuring that financial returns are realized by women at the producer/harvester level where measures to sustainably manage the resource are implemented.

Start simple. In The Gambia, TOWA's marketing is based on making visible to the consumer the added value of hygiene and the source of the oysters from a community engaged in sustainable management. Practices include the relatively simple measures of, branding of TOWA members selling on the roadside and in markets with a uniform red jacket, wearing head coverings and gloves, placing product on a raised table under a shelter, covering product with netting to keep out flies.

5.9 Public Outreach



Figure 11 Public outreach

The public and government at all levels are generally unaware of the oyster fishery and the activities of women oyster harvesters and producers. Understanding and support for the collective actions urgently needed to sustainably manage oyster fisheries and mangrove wetlands is, therefore, weak.

Effective practices shared:

Durbars and oyster festivals. DOPA recently held a Durbar to celebrate with the public and draw attention to the impact of the 5 month closed season they piloted in the Densu estuary. In fact, the Sakumo River Chief's interest in sending a representative on this study tour to learn more resulted from that outreach event. TOWA organized several annual oyster festivals, inviting the public, civil society organizations, and government officials, including the President, who attended their event.

Media coverage and programs are effective for reaching larger audiences, providing the opportunity to engage them, and answer their questions. Coverage of events by radio, television and newspapers is used in Ghana and The Gambia, especially to raise awareness and announce the start of the closed season. TOWA has participated in many local radio programs in The Gambia in interview and call-in format. TOWAs' work has also been featured internationally on BBC radio.

5.10 Data Collection

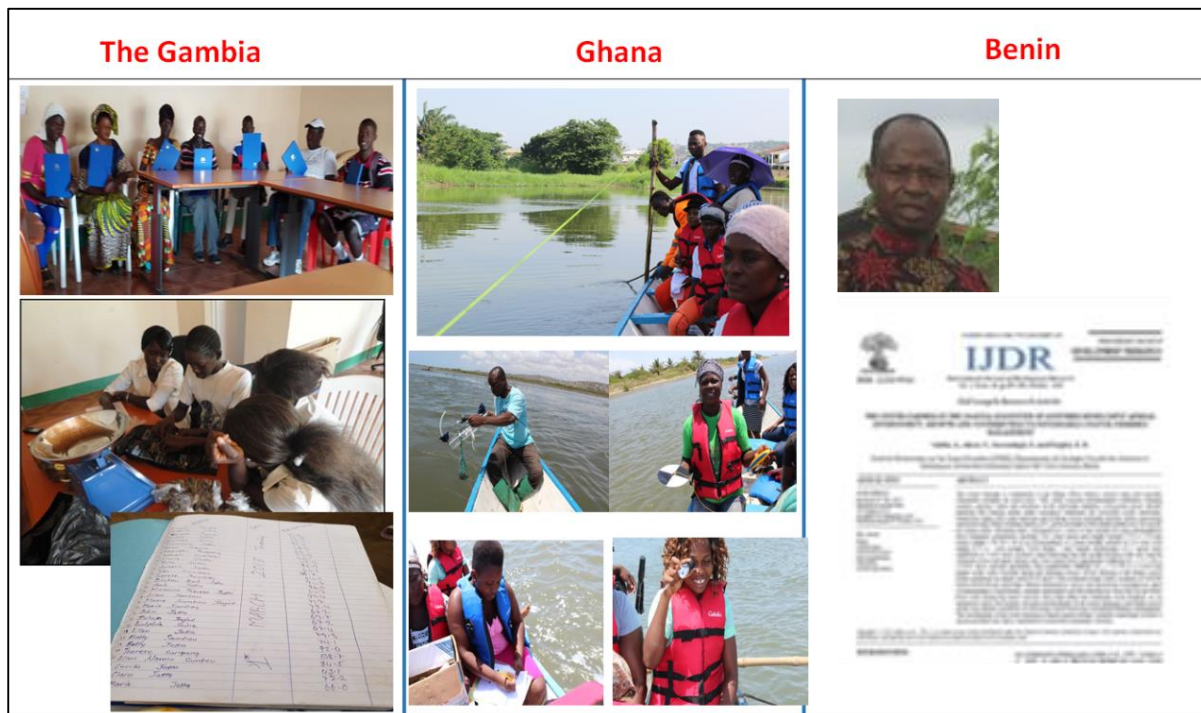


Figure 12 Data collection

When women oyster producers and harvesters collect their own data, they are empowered. They acquire new skills. They own the information and use it directly for oyster management decision-making.

Effective practices shared:

Water quality data collection by DOPA in the Densu has increased understanding of DOPA members about the varied and dynamic water quality conditions in the estuary over space and time. In The Gambia, TOWA did not collect water quality data themselves, but participated in using three years of data collected by the government water resources laboratory to define and map water quality zones in the Tanbi Wetlands where the safety of oysters for human consumption could be considered high, medium or low risk.

Harvest data collection has recently been initiated by TOWA. One literate volunteer was trained in each community. This is the first harvest data ever to be systematically collected on oysters in The Gambia. TOWA previously engaged the literate daughters of members (who are generally not literate) to sample oysters from market sites during the 4-month open season to monitor the size of marketed oysters over the period. The rate and extent of declining oyster size over the 4 months can indicate that the resource does or does not seem to be overfished and whether a shorter open period or other measure might need to be initiated.

Local University engagement. The University of Abomey-Calavi, Department of Zoology in Benin (Dr. ADITE and his students) and the University of Cape Coast in Ghana (PhD candidate Sheila Fynn Korsaa and colleagues) have engaged with oyster communities to conduct relevant research on oysters and their habitats as well as on women producers' activities. These are partners that can also help compile and analyze the water quality and harvest data collected over time by the associations.

5.11 Use of Shells



Figure 13 Use of shells

Discarded oyster shells are a valuable resource and potential revenue stream.

Effective practices shared:

Return shells to the lagoon to provide substrate for spat collection and to reduce acidity levels in the water to maintain conditions favorable for oyster growth.

Paving, reinforcing concrete, making lime, and as an animal feed component are common uses and markets for oyster shells in the three countries.

Stockpile shells as a savings account. Because they can be sold in bulk for multiple uses, many women save large stocks of shells as a type of savings or risk management strategy, ready to be liquidated relatively quickly in case of need.

5.12 Diversified Livelihoods

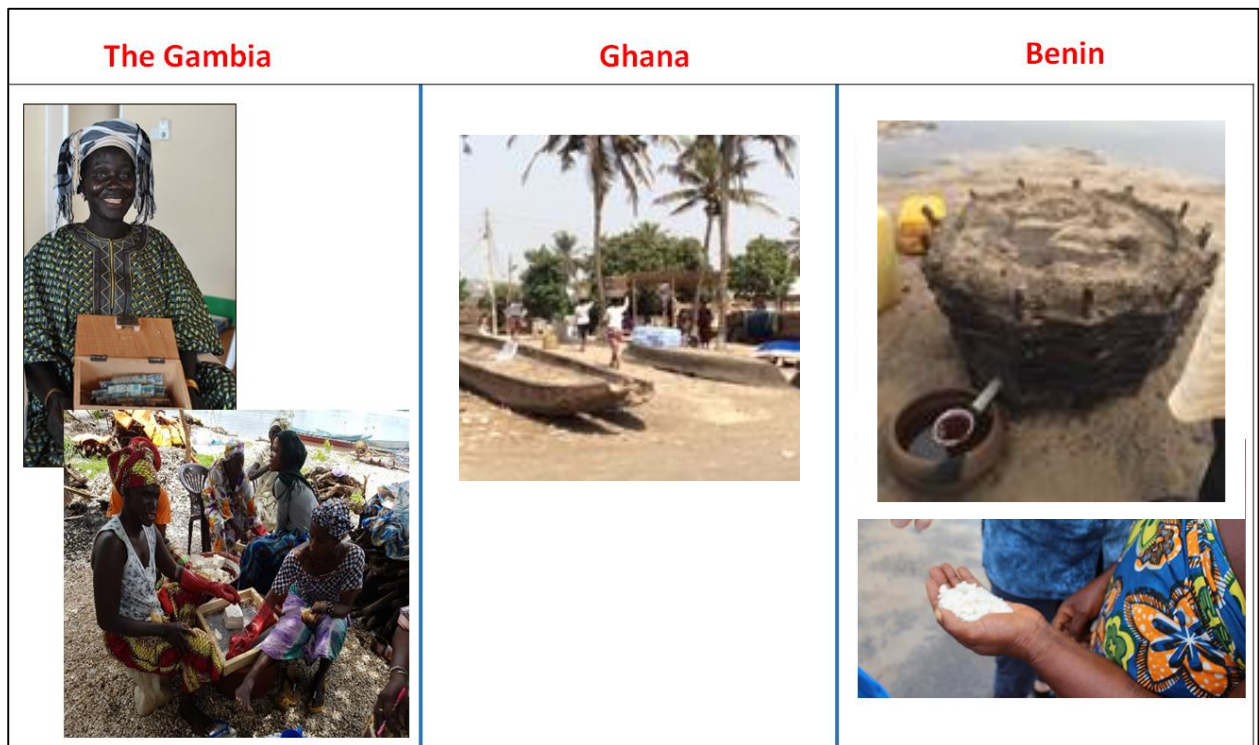


Figure 14 Diversified livelihoods

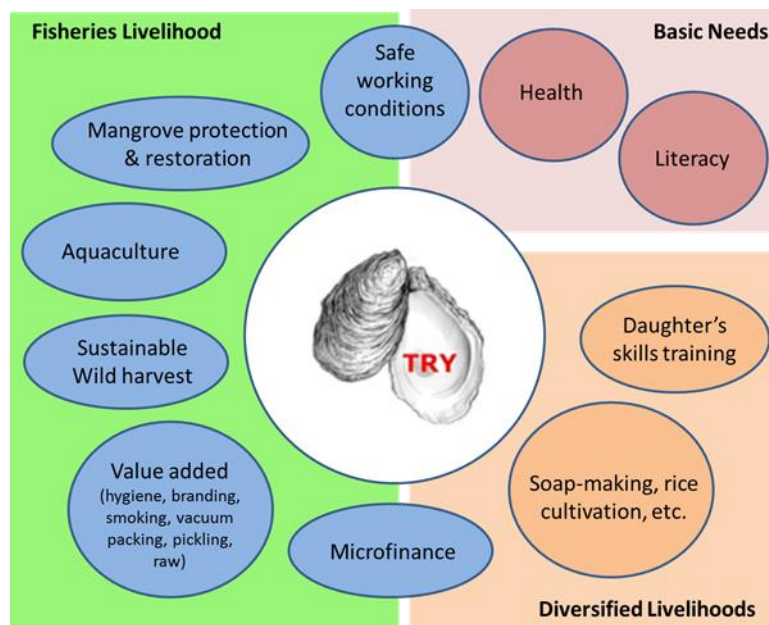


Figure 15 Meeting basic needs through diversified livelihoods

Sustainable management of oyster resources and the mangrove wetland ecosystems where they thrive generally means reducing extraction of marketable and economically useful products, especially in the short term. Communities, and especially women, who depend on these resources for their livelihoods are often economically vulnerable with limited access to

other sources of revenue. Establishing diversified livelihoods is an important enabling condition for resource users to sustainably manage the resource.

Effective practices shared:

Oyster livelihoods as a secondary, seasonal livelihood. In Ghana and Benin, the women who harvest and produce oysters are engaged in other principal livelihoods such as fish mongering and salt production. They engage in oyster activities in the off season. In The Gambia, women oyster harvesters are more dependent on oyster activities as a principal livelihood.

Developing women’s financial literacy and access to credit has been an approach in all three countries, increasing capacity to invest in improvements in the oyster value chain and to take advantage of other economic opportunities.

Developing new skills and products such as soap-making, textile dyeing, handicrafts, and eco-tourism have been initiated in The Gambia.

Integrated programs to support women’s fishery livelihoods, diversified livelihoods and basic needs together have been most effective for enabling them to take the actions needed to reduce pressure on oyster and ecosystem resources. Basic needs also include securing their children’s future through access to a quality education as a priority of women oyster harvesters.

5.13 Networking



Figure 16 Networking

Well networked communities of practice among women oyster harvesters and with other stakeholders locally, nationally and in West Africa can support sustainable management of the resource and deliver win-win outcomes driven by resource users.

Effective practices shared:

Scale-up of participatory, rights-based, ecosystem-based oyster fishery co-management by women. Ghana's Densu estuary oyster co-management plan is inspired by the oyster co-management experience in The Gambia. Benin's oyster communities see a similar opportunity to learn from these experiences.

Supporting actors including traditional leaders, government agencies, academia, NGOs, the media, and the private sector can, likewise, network with their peers locally, nationally and internationally to provide more effective support. The study tour began this process among universities, fisheries agencies and Forestry/Parks and Wildlife agencies in Benin, Ghana and The Gambia.

6. NEXT STEPS

6.1 Ghana

- i. DOPA, with the support of DAA and Sakumo traditional leaders, will find ways to continue on-going outreach and engagement efforts in Densu estuary stakeholder communities with renewed emphasis on addressing traditional leaders and accounting for (not aiming necessarily to resolve) longstanding issues about decision-making authorities in the estuary. These issues are not stemming from the oyster co-management process, but the process needs to acknowledge that they exist and plan accordingly.
- ii. DOPA, with the support of DAA and UCC, will consider the relevance of additional oyster management and production measures observed in Benin for the Densu estuary and develop plans to pilot priority measures. These include:
 - A longer closed season. DOPA has piloted a 5-month closure with good initial results, but The Gambia closes for 8 months and Benin allows a 12-month growth period after starting with juveniles.
 - Redistribution of juveniles from dense areas to lower density areas
 - Shucking of harvested mature oysters without boiling to preserve juveniles stuck to the shells to be thrown back for grow out.
 - Whether the Densu, with its high density of oyster production, can serve as a source of spat and juveniles for other oyster grow out areas in Ghana. It has similar characteristics with Avlo in Benin. If feasible, this could create an additional revenue stream.
- iii. DOPA will focus on improving the quality of oyster it brings to the consumer in order to increase demand and price. In Benin, shucking the oyster live (rather than boiling to open it) and washing the fresh oyster multiple times to thoroughly remove grit before cooking produced a fresher, grit-free product.
- iv. Realizing that, like the mangroves in Benin, the Densu estuary mangroves are severely degraded and ecosystem services have been lost, DOPA will continue its replanting, restoration and awareness raising efforts, particularly among fishermen.
- v. DOPA will focus on addressing the serious and growing problem of garbage and waste, including plastic waste, in and around the Densu estuary. The problems observed in Degoué lagoon highlighted to participants that Ghana also still has many improvements to make on this issue.

- vi. The Forestry Commission study tour participant will coordinate with The Gambia Parks and Wildlife representative participant to ensure that Ghana's and The Gambia's next official National Communications to the RAMSAR Convention (due in January 2019 for COP 14 in 2019) include similar paragraphs about the oyster fisheries in these sites and the contributions of the respective oyster co-management plans to achieving national commitments on management of these wetlands of international importance. They will also explore the possibility of Ghana and The Gambia making a joint presentation on the theme at COP14 (COP 13 is in October 2018, but deadlines for presentations may be past).
- vii. DOPA will continue to pursue engagement with the Weija Dam Commission to get better information about management by the Commission of water flows, to better adjust their own plans and to potentially influence dam management decision-making on issues affecting oyster management. Also, to identify research questions that might be relevant.
- viii. The UCC study tour participant and University of Abomey-Calavi researchers will look for opportunities to collaborate on research and publication on oyster production and related environmental issues in Ghana and Benin.
- ix. SFMP and DAA will follow up with Sakumo traditional leadership on their readiness to initiate a fishery co-management planning process and/or pilot management measures such as a closed season for the Tilapia fishery in the Sakumo lagoon.
- x. DOPA, TOWA and the Benin National Association will maintain contact through participants of this study tour to continue sharing challenges, successes and opportunities for joint action.

6.2 Benin

- i. Benin oyster producers will continue to organize and develop their local and national associations and identify priority initiatives they want to take, including protection and restoration of mangrove wetlands.
- ii. Dr. ADITÉ will continue to engage with oyster producing communities in Western Benin and with his students on relevant research to expand the integration of local and scientific knowledge to contribute to improved oyster fishery and ecosystem management.

6.3 The Gambia

- i. TOWA will share the study tour lessons learned with its' members and stakeholders in The Gambia and will also consider the relevance of some of the additional oyster management and production measures observed in Benin for application in their situation.
- ii. The Gambia Parks and Wildlife participant on the study tour will liaise with his Forestry Commission colleague in Ghana to contribute text on oyster management to each country's next National RAMSAR Convention Report.

7. CONCLUSION

The power of the peer to peer learning format among women resource user communities was demonstrated during the study tour to Benin. DOPA participants were able to see communities in a neighboring country with similar challenges striving to apply the principles of sustainable management to their ecosystems, their fisheries and their livelihoods. The experience impressed upon DOPA participants that their situation is not unique, that they have made significant progress, but they still have work to do on many critical issues. It also highlighted the value of exposure to different approaches and the need to continuously explore, adapt and test new ideas.

Finally, the peer to peer study tour format showcased the capacity DOPA members have developed in a short period of time since the association was formed. They led discussions, spoke with confidence about their activities and were insightful and analytical in their questions and observations. They represented themselves and their association well. It is evident that they are well positioned to use this same capacity to share and communicate the lessons learned from the study tour back to their communities in Ghana and to lead the implementation of next steps.

ANNEX 1. PHOTO GALLERY



Figure 17 Women of Degoué welcoming the Ghana and the Gambia Team



Figure 18 Procession leading the study tour team to the palace of the Chief of Degoué



Figure 19 A courtesy call by the Gambian and Ghana Team to the Chief of Degoué



Figure 20 Presentation of gift from DOPA by Dr. Alphonse Adité to the Chief of Degoué



Figure 21 Acceptance of Gift by the Chief of Degoué



Figure 22 Traditional welcome with water by the locals to the Ghana and The Gambia team



Figure 23 Women of Degoué welcoming the Ghana team at the durbar



Figure 24 Dr. Alphonse Adité, addressing the durbar



Figure 25 Fatou Janha from The Gambia introducing TOWA and how they manage oysters in their country



Figure 26 DOPA representative Bernice Bebli, introducing DOPA and what they do



Figure 27 Mr. Francis Amporfo on behalf of the Chief of Sakumo sharing the role of traditional authorities in Ghana on oyster management in Densu River



Figure 28 Benin women's representative sharing experiences on how they manage their oysters



Figure 29 Ghana Team dancing to music by the Benin women's group



Figure 30 Degoué Chief's spokesperson showing appreciation and requesting more collaboration with the three countries



Figure 31 Karen Kent of URI sharing the benefits of associations in Oyster Management



Figure 32 Women of Degoué showing the juvenile oysters (attached to larger shells) ready for transplanting



Figure 33: The Gambia and Ghana team getting ready to plant the juvenile oysters with the Benin women



Figure 34 Ghana Team and the Benin Team going to plant oysters



Figure 35 The Ghana team observes the Degoué women planting juvenile Oysters in areas marked by sticks



Figure 36 The Benin women teaching the Ghana team how to shuck harvested oysters live, not by steaming to open them as in Ghana and The Gambia



Figure 37 Cleaned Oysters, washed four times, ready for market and for cooking



Figure 38 Benin woman demonstrates how Oysters are spiced and steamed in Benin



Figure 39 Ghana team being taught the process of frying



Figure 40 Ghana participants from UCC, DOPA and DAA discussing the cost of oyster culture compared to wild harvest after seeing the cost of inputs (Juvenile purchase, transportation and labor) in Degoué.



Figure 41 Benin women make a presentation to DOPA



Figure 42 The DOPA representative showing some of the items in the gift box



Figure 43 The team boards a boat to visit the people of Avlo to learn about their juvenile Oyster trade



Figure 44 Visit to the Chief and Oyster pickers at Avlo by the Ghana and The Gambia Team



Figure 45 Dr. Alphonse Adité makes a presentation to the Chief of Avlo



Salt is made by scraping the high salt concentration surface sand from the tidal lagoon at low tide and packing it into a basket structure. Salt water from the lagoon is poured over, filtering out a high concentration salt solution. The concentration is tested by dropping in a palm nut kernel. If it floats, it is ready for boiling to evaporate the liquid.

Figure 46 Salt production as practiced in the Ouidah area of Benin



Figure 47 The wrap up session with USAID/ Benin, The Department of Fisheries of Benin and the Ouidah Mayor's Representative

ANNEX 2. LIST OF BENIN PARTICIPANTS

N°	Name	Water body	Village
1	FASSINOU Victor	Coastal lagoon	DEGOUÉ (village)
2	BESSANH Firmin	Coastal lagoon	DEGOUÉ (village)
3	KPADONOU Ziansi	Coastal lagoon	DEGOUÉ (village)
4	KOUGBLA Adrien	Coastal lagoon	DÉGOUÉ (Beach)
5	VODOUNNON Victorin	Coastal lagoon	DÉGOUÉ (Beach)
6	HOUNGBO Sossi	Coastal lagoon	HOUAKPÈ
7	SESSOU Christine	Coastal lagoon	HOUAKPÈ
8	SAGBO Odile	Coastal lagoon	HOUAKPÈ
9	KOUGBLA Philomène	Coastal lagoon	AIDO-PLAGE
10	AMOUSSOU Reine	Coastal lagoon	MEKO
11	NOUDA Rose	Coastal lagoon	GANHONOU
12	GIVIODE Hortense	Coastal lagoon	GANHONOU
13	DOVI Abla	Coastal lagoon	DJONDJI
14	ESOE Honorine	Coastal lagoon	DJONDJI
15	GADOUMATOU Odette	Coastal lagoon	DJONDJI
16	DOVONOU Yvette	Coastal lagoon	MEKO
17	ATTIOGBE Bokpè	Coastal lagoon	AVLO
18	GBEDOHONTA Nadège	Lake Nokoue	ZOGBO
19	PADONOU Bernard	Lake Nokoue	ZOGBO
20	GBLONDOUME Hélène	Coastal lagoon	AIDO-PLAGE
21	KODODA Josephine	Coastal lagoon	MEKO
22	SEVI Rosine	Coastal lagoon	DJEGBADJI
23	TOHOUEGNON Bénoite	Coastal lagoon	DJEGBADJI
24	SEGBEGNON Marie-Thérèse	Coastal lagoon	DJEGBADJI
25	HODONOU Fiavi	Lake Aheme	AGBANTO-ZOUME
25	ADJI Hoovi	Coastal lagoon	AIDO-PLAGE
27	AKOUA Onoumon	Coastal lagoon	AVLO
28	SODEKON Ahouangansi	Coastal lagoon	SEYIGBE
29	GBEGNON Philomène	Coastal lagoon	SEYIGBE
30	HOUNDEYEME Hessou	Coastal lagoon	DÉGOUÉ (Beach)
31	FOLLY Josephine	Coastal lagoon	DÉGOUÉ (Beach)
32	TOHOEGNON Emilienne	Coastal lagoon	DÉGOUÉ (Beach)
33	BESSAN Honorine	Coastal lagoon	DÉGOUÉ (Beach)
34	HOUEDADO Collecte	Coastal lagoon	DÉGOUÉ (Beach)
35	DOTONOU Bernadette	Coastal lagoon	DÉGOUÉ (Beach)
36	LOKOSSOU Augustine	Coastal lagoon	DÉGOUÉ (Beach)
37	HOUNKPATIN Odile	Coastal lagoon	DEGOUÉ (village)
38	ALOGNON Clémentine	Coastal lagoon	DEGOUÉ (village)
39	NONVI Simon	Coastal lagoon	DEGOUÉ (village)

40	MAHOUSI Victor	Coastal lagoon	DEGOUÉ (village)
41	HOUNGAN Antoine	Coastal lagoon	DEGOUÉ (village)
42	PADONOU Raoul	Coastal lagoon	DEGOUÉ (village)
43	ALOGNON Joel	Coastal lagoon	DEGOUÉ (village)
44	ZINSOU Firmin	Coastal lagoon	DEGOUÉ (village)
45	VODOUNON Emile	Coastal lagoon	DEGOUÉ (village)
46	ATTIOGBE Joseph	Coastal lagoon	DEGOUÉ (village)
47	ZOUNDEGNON Isidore	Coastal lagoon	DEGOUÉ (village)
48	HOUSSINOU François	Coastal lagoon	DEGOUÉ (village)
49	VODOUNON Bénédicte	Coastal lagoon	DEGOUÉ (village)
50	AMOUSSOU Epiphane	Coastal lagoon	DEGOUÉ (village)
51	DOSSOU Houénoussi	Coastal lagoon	DEGOUÉ (village)
52	GBELEWA Hounsiga	Coastal lagoon	DEGOUÉ (village)
53	FAGNON Sossi	Coastal lagoon	DEGOUÉ (village)
54	MELENOU Célestine	Coastal lagoon	DEGOUÉ (village)
55	AGBOGBA Avlossi	Coastal lagoon	DEGOUÉ (village)
56	ADOGO Kai	Coastal lagoon	DEGOUÉ (village)
57	DOSSOU Ayaba	Coastal lagoon	DEGOUÉ (village)
58	FANOU Louise	Coastal lagoon	DEGOUÉ (village)
59	TOHOUEDO Clémentine	Coastal lagoon	DEGOUÉ (village)
60	METOKADI Homevo	Coastal lagoon	DEGOUÉ (village)
61	VODJO Collecte	Coastal lagoon	DEGOUÉ (village)
62	DEGBO Zinsi	Coastal lagoon	DEGOUÉ (village)
63	LOKOSSI Zinsou Cosme	Coastal lagoon	DEGOUÉ (village)
64	VODOUNON Christophe	Coastal lagoon	DEGOUÉ (village)
65	ANANI Jacqueline	Coastal lagoon	DEGOUÉ (village)
66	DOTONOU Mahinou	Coastal lagoon	DEGOUÉ (village)
67	VODOUNOU Josephine	Coastal lagoon	DEGOUÉ (village)
68	TOSSOSSE Agnès	Coastal lagoon	DEGOUÉ (village)
69	ZINSOU Chantal	Coastal lagoon	DEGOUÉ (village)
70	LISSASSI Damien	Coastal lagoon	DEGOUÉ (village)
71	LOKOSSOU Zinhoué	Coastal lagoon	DEGOUÉ (village)
72	HOUÉVI Fassinou	Coastal lagoon	DEGOUÉ (village)
73	VODOUNOU Hounlomè	Coastal lagoon	DEGOUÉ (village)
74	ANANI Cathérine	Coastal lagoon	DEGOUÉ (village)
75	ZOUDEGNON Albertine	Coastal lagoon	DEGOUÉ (village)
76	DOSSOU Pierrette	Coastal lagoon	DEGOUÉ (village)
77	DIMIGOU Virginie	Coastal lagoon	DEGOUÉ (village)
78	ANANI Elisabeth	Coastal lagoon	DEGOUÉ (village)
79	LOKOSSOU Cécile	Coastal lagoon	DEGOUÉ (village)
80	LOKOSSOU Viviane	Coastal lagoon	DÉGOUÉ (Beach)
81	DOSSOU DEKON Justine	Coastal lagoon	DÉGOUÉ (Beach)

82	HOUNHOUEOU Agouessi	Coastal lagoon	DÉGOUÉ (Beach)
83	HOUNHOUEOU Ganouho	Coastal lagoon	DÉGOUÉ (Beach)
84	HOUNSSINOUE Pélégie	Coastal lagoon	DEGOUÉ (village)
85	DOSSIVI Rosaline	Coastal lagoon	DEGOUÉ (village)
86	KODEGBE Justine	Coastal lagoon	DEGOUÉ (village)
87	ATO Marie	Coastal lagoon	DEGOUÉ (village)
88	AIDEHOU Béatrice	Coastal lagoon	DEGOUÉ (village)
89	ZOTCHI Gbeminssi	Coastal lagoon	DEGOUÉ (village)
90	HOUNHENOUE Agathe	Coastal lagoon	DEGOUÉ (village)
91	KOUMI Bénédicte	Coastal lagoon	DÉGOUÉ (Beach)
92	VODOUNNON Philomène	Coastal lagoon	DÉGOUÉ (Beach)
93	SOSSA Hounsiabè	Coastal lagoon	DÉGOUÉ (Beach)
94	DOSOU Germaine	Coastal lagoon	DÉGOUÉ (Beach)
95	AWOUNOUE Mindégbèhoun	Coastal lagoon	DÉGOUÉ (Beach)
96	HESSOUE Rosalie	Coastal lagoon	DÉGOUÉ (Beach)
97	AFOSSA Edith	Coastal lagoon	DÉGOUÉ (Beach)
98	ANOUMON Ayaba	Coastal lagoon	DÉGOUÉ (Beach)
99	FASSINOUE Madeleine	Coastal lagoon	DÉGOUÉ (Beach)
100	SAHOSSI Hélène	Coastal lagoon	DÉGOUÉ (Beach)
101	ZINSOUE Germaine	Coastal lagoon	DEGOUÉ (village)
102	MIWAKPONWE Cécile	Coastal lagoon	DEGOUÉ (village)
103	AVO Dadjì	Coastal lagoon	DEGOUÉ (village)
104	ZINSOUE Josephine	Coastal lagoon	DEGOUÉ (village)
105	ANANI Lisette	Coastal lagoon	DEGOUÉ (village)
106	DEKOSSI Thérèse	Coastal lagoon	DEGOUÉ (village)
107	DOSSOUE Noellie	Coastal lagoon	DEGOUÉ (village)
108-123	Respected persons (Chief of the village, President of the village development association, Old people)		

ANNEX 3. MAP OF WESTERN BENIN AREAS VISITED AND PARTICIPATING

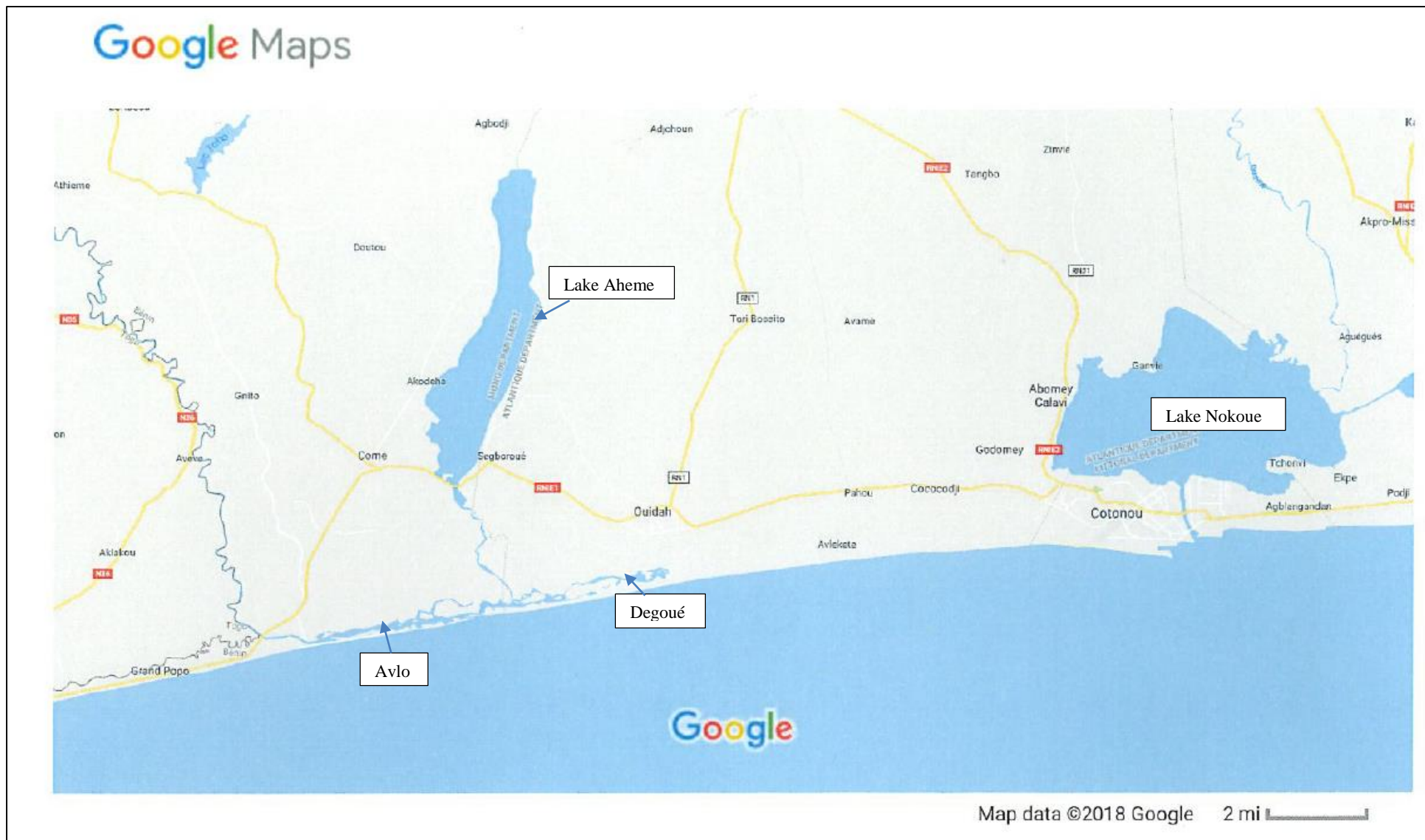


Figure 48 Map of locations in Benin visited by participants