



Maria Kondra

# Understanding the mechanisms that shape access to the fisheries ecosystem service in Tsokomey, Accra

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Authors' contact

Maria Kondra  
kondra@uni-trier.de

# Abstract

Questions of access to ecosystem services remain largely unaddressed. Yet, in the coming decades, addressing access to services and securing them for livelihoods and well-being of people will likely gain importance, especially to guide according policies at the local scale. Through a qualitative approach, this paper addresses the mechanisms that shape access to the fisheries ecosystem service in Accra, Ghana. The analysis uses a framework that focuses on access to land, tools and technology, knowledge and information, capital and credit, as well as labor. This research reveals how access is organized across the different categories of this framework and how people's well-being is shaped. Moreover, it helps to further our understanding of what regulates the access to ecosystem services and how to address future shocks and capacity in terms of production of ecosystem services.

# Understanding the mechanisms that shape access to the fisheries ecosystem service in Tsokomey, Accra

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## 1 Introduction

Since the 1990s, a number of key publications helped to mainstream the concept of ecosystem services in policy and academia. One of the influential publications, the Millennium Ecosystem Assessment, warned policy makers to reverse the current state of ecosystem degradation and resulting negative impacts on human well-being. However, until today, the contribution of access to ecosystem services in ecosystem governance has remained rather theoretical than practical. Especially power relations that mediate access, use and distribution of ecosystem services have been not thoroughly addressed in existing studies (García-Llorente et al., 2018).

Ecosystem services research still assumes that ecosystem services flow automatically to humans without any intervention (Martín-López et al., 2019). Considering this assumption, a question remains as to how communities access ecosystem services and maintain this access over time. In this article, we want to examine the access to resources in Tsokomey, Ghana, and concentrate on the different mechanisms that affect the production of the fisheries ecosystem service.

Access has a crucial role in how people experience ecosystem services. Social relations, particularly power relations, mediate actors ability to manage and access ecosystem services (Martín-López et al., 2019). Obtaining benefits from ecosystems usually requires an investment of human labor and human-made capital for producing ecosystem services. Additionally, processes in an ecosystem only get value (positive or negative) within specific human contexts and engagement. The entire activity of production and consumption of ecosystem services is embedded in social structures and institutions that determine who gets access to which resource, capital or labor, and influences strongly the pattern of demand and consumption of goods and services (Lele, 2013).

We still have a very fragmented understanding of the diversity of stakeholders, their motivations and preferences for various ecosystem services. Furthermore, we do not understand how conflicts and inequalities arise in terms of access to ecosystem services by different individuals and groups. International agendas such as Millennium Ecosystem Assessment, rarely address who benefits from ecosystem services and how services are distributed among certain groups; however, a better understanding of these dynamics would serve as an important tool for governing ecosystem services. Examining the relationship that specific groups have with each other and what hinders or enables their access to and benefits from ecosystem services would strengthen our understanding of the trade-offs between current and future needs and rights of communities, social relationships that determine in(equalities) of access and benefits of different groups to ecosystem services. Moreover, research in this area could play a fundamental role in evaluating management options and their implications for livelihood and well-being (Bennett et al., 2015).

In our analysis, we focus on the access in fisherwomen communities that are involved in fisheries for their livelihoods in a coastal community Tsokomey, located in the capital of Ghana, Accra. The fishing community provides an interesting case study as the women act as the primary heads of their households and rely only on different types of fishing for their livelihood.

The paper is organized as follows: we introduce the framework for analyzing access to ecosystem services, followed by a description of the methods and the case study. Finally, we demonstrate in detail how access is organized and conclude with important implications for further research.



**Picture 1: Tsokomey village with an access point for fisheries in the Densu Delta Wetland. Source: WaterPower (2018)**

## **2 Assessing access to ecosystem services**

We employ the “theory of access” as developed by Ribot and Peluso (2003). They define access as “the ability to derive benefits from things”. They see access as *the bundle made up of interwoven strands that together create “web of benefits” experienced by an individual or a group at a given point in time*. In this publication, they argue that people draw from different “bundles

of power” which enables them to access resources in our case the ecosystem service fisheries. The bundles are “*embodied and exercised through*” various mechanisms. Additionally, they discuss that in some cases, access to a resource is not established in direct relation, but for example through having access to: land, tools and technology, capital and credit, markets, knowledge and information, and labor opportunities. We use these categories to analyze access to the fisheries ecosystem service (Ribot & Peluso, 2003).

In terms of ecosystem services production, two transformations of the biophysical flows of an ecosystem have to occur. First, certain production processes emerge as particularly important. In our case, the fisherwomen need, for instance, capital for producing smoked fish. The second transformation presents a turning point, where an ecosystem service is turned into a benefit to someone, i.e. the ecosystem service has to contribute to the fisherwoman’s well-being (Berbés-Blázquez, Bunch, Mulvihill, Peterson, & van Wendel de Joode, 2017).

Similar to previous research, this article focuses on the system of production for obtaining an ecosystem service. We analyze the mechanisms used by fisherwomen to gain, maintain and control access to the production of ecosystem services. Herein, maintaining access means the effort of keeping a particular service; gaining access means the process of establishing access and controlling means the ability to regulate other people’s access to the service (Berbés-Blázquez et al., 2017). In this article, we focus on access in regards to the system of production applied to obtaining an ecosystem service and its corresponding socio-economic organization that oversees the distribution of the benefits and impacts of that service. The analysis focuses particularly on fisherwomen who obtain access to the fisheries ecosystem service in Tsokomey village.

### **3 Methods & Results**

#### **3.1 Methods**

In this article, a variety of methods was used to obtain information on the access to ecosystem services with respect to the ecosystem services production and distribution. By conducting semi-structured open-ended interviews, participant observation, participatory mapping and group discussions, we identified local fisherwomen, fishmonger, environmental non-governmental organizations (NGOs) and a hotel owner as the actors benefitting from these services. The majority of fisherwomen have a very high dependence on ecosystem services. Nearly the entire community is dependent on fishing as their primary source of income. In addition, fisher’s identities along the coastline are strongly associated with the marine environment and their occupations. Moreover, there are few alternative livelihoods available along the Ghanaian coast, especially in this part of Accra. Most of the benefits from tourism sector do not flow to the local communities.



In addition, we conducted three focus group discussions to map the access points to ecosystem services but also to assess the influence of different actors on decision-making regarding the fisheries ecosystem service. This helped to understand the social relations among actors. In addition, we also identified and interviewed the decision-makers in this area as they influence the management of ecosystem services by promoting the conservation and by controlling the access over and use of water bodies. The interview guide was designed based on (Berbés-Blázquez et al., 2017) and focused on following questions:

1. Who controls the access to the lagoon on the case of fisheries?
2. Who controls access to the knowledge and information required to produce the fisheries ecosystem service?
3. Who controls access to the tools and the technology associated with the production of ecosystem service?
4. Who controls the access to the markets?
5. Who is able to labor or has access to laborers to work in the production of ecosystem services? (Berbés-Blázquez et al., 2017).

The fieldwork was conducted from July-September 2018.

**Table 1: Overview of the interviews conducted in the case study site.**

Occupation	Number of interviews
Chief fisherman	1
Fisherwomen	17
Fishmonger	9
Assembly men	1
Wulomei (traditional high priest)	1
Local NGO	3
Hotel manager	1

### 3.2 Research site

The village Tsokomey is located in Bortianor municipality of the Greater Accra Region. Ga and Ewe tribes reside in this area next to each other. The sea and the Densu delta surround the Tsokomey village. The Densu delta represented one of the most important wetlands in Accra. The wetland has no direct connection to the sea, but during the rainy season, the lagoon is often flooded and discharges into the sea, while seasonal flooding brings detritus, nutrients and pollution. The Weiija dam located approximately 11km upstream interrupts the water inflow during the dry season and causes severe flooding of the area during the rainy season. The dam retains sediments and



the blocked inlet reduces the overall water volume. Pollution is one of the major threats to the Densu Delta wetland. Human waste pollution is increasing since a majority of the population in the region has no access to adequate toilets. In addition to these pollution pressures, encroachment presents another threat to the wetland. The rate of current housing encroachment is alarming. Many new houses are built directly in the core area of the wetland (Kondra, 2016).

Most of the population in Bortianor is part of the fishing community or engaged in activities along the value chain of fishing and fisheries. River fishing and fish processing are the most common sources of income for families. Fishing in the Densu River/wetland and fish processing is the most common source of income for families. Women are often actively involved in fishing and fish mostly in the Densu River. However, they frequently have a second occupation as fishmongers or pursue other low value-adding activities such as fish cleaning and/or fish carrier. Furthermore, a group of women as well as some men have specialized in oyster harvesting, although it is not considered a good source of income. However, in the last two years, this started to change with the establishment of the USAID founded project that promotes sustainable community fishing and educates women on handling (processing and preserving) oysters so they can be sold on the national market. Through this project, the women learned how to balance sustainable harvesting of oysters and started replanting the mangrove forests. Some of the women are involved in smoking fish and sell it to the local markets in Accra.

The Densu River was designated as a Ramsar site in 1992 and thus recognized as a protected wetland of international importance under the International Convention of Wetlands. Our study focuses primarily on the fisherwomen from the Tsokomey village.



Picture 2: Tsokomey village. Source: WaterPower (2018)

### **3.3 Access to the fisheries ecosystem service in Tsokomey village**

#### **3.3.1 Land**

Customary and statutory land laws shape access to land in Ghana. Customary groups (stools, skins, and land-owning families) own seventy-eight percent of land in Ghana. Traditional authorities (chiefs and family heads) are the custodians of stool, skin or family lands. Together with a council of elders, these authorities govern and manage the land (Bartels, Bruns, & Alba, 2018).

Also in this area, the land belongs to different families; however, there is no active chief in this area. Wulomei (the traditional high priest) owns some portions of land and releases it to interested people. In general, there is no free space for housing in Tsokomey anymore. Additionally, all farmland has been turned into residential areas.

With rising urbanization and resulting encroachment, this area and particularly the water bodies (such as wetlands) are under pressure including high siltation in the Densu river.

#### **3.3.2 Tools and Technology**

In order to reach certain parts of the wetland for fishing and oyster harvesting, the women need to rent a boat, which costs them around 10 Ghana Cedi. Usually, these costs are split among 4-5 women.

For catching fish, but also oysters, the women use manual labor and simple tools. In the oyster harvesting process, they use gloves and rubber boots for protection of their legs and hands and a basket to store the harvest. For catching crab and fish, three different tools can be used: a basket, nets and/or traps. However, the nets are expensive and high maintenance. Usually, there is only one net per family.

It is relatively easy for the women to gain control and maintain access to tools and technologies in fisheries.



Picture 3: Tools used for fishing and oyster harvesting. Source: WaterPower (2018)

### 3.3.3 Knowledge and Information

Fishing is generally based on traditional knowledge that regulates the fishing practices, fishing seasons and fish species harvested.

Although oyster harvesting has been there for generations, the knowledge and information has changed during the past 5 years or so. The fisherwomen established an association called DOPA which allowed them to agree upon an oyster ban, strictly prohibiting oyster picking from November-April. The ban was set up in collaboration with a NGO that is an internationally acknowledged USAID funded project. They influence the management of ecosystem services by promoting the restoration and preservation of the wetland, thus the NGO controls the access over and use of water resources.



**Picture 4: Women processing oysters. Source: WaterPower (2018)**

Besides harvesting oysters, the women collect data on environmental parameters to monitor the water quality (this work is done in collaboration with a PhD student, who also trained the women). Due to the support of the respective NGO, the women get to participate in workshops (one of the workshops took place in Gambia) to learn how to harvest, cook and conserve the oysters. Further themes of the workshops are leadership, capacity building and co-management; scientific trainings on ecology and scientific knowledge on biology of the lagoon. Furthermore, the women catching oysters work together with the Wulomei, who announces the opening and closing seasons for oyster harvesting and consults with the DOPA women.

Several interviewees reported that before there were elders in this community, who were the main care takers of the community and were responsible for distributing important information in the community. In case of an emergency or a family dispute (such as land allocation), elders were the first point of contact for assistance. However, today nobody likes to take over this role anymore, thus leaving the community leaderless. This has been accounted as detrimental to the community structure.

Through the association, the DOPA women have relatively easy access to knowledge and information. The NGO is providing the women with necessary

trainings and information to sustain the livelihood and even improve it further. However, the women who are not part of the association have difficulties to access all this information.

#### **3.3.4 *Markets and pricing***

Currently, there is no local food market at Tsokomey there the women can sell their fish or oysters. The women have usually customers to whom they bring the fish directly or they let the fish de-gutter and clean from fishmongers first. Unlike, women who fish and smoke fish at the same time have access to markets and credit. Usually, they go by themselves or send a family member 1-2 times a week to central markets in Accra to sell their product.

Currently, the NGO is trying to establish an access to the markets for the women who harvest oysters. However, the environmental parameters have to be stable and approved by the Public Health Association to be considered as safe food source.

#### **3.3.5 *Capital and credit***

In this area, women are considered the head of their family, the main earner and care taker. All interviewed fisherwomen have reported that they have no access or possibility to get a loan. However, it was stated that the women who smoke and process the fish do have the opportunity to get a loan. These women usually earn more money, have more employers and are able to produce all year around in a larger scale. The steady income allows them to take loans and repay them on time.

#### **3.3.6 *Labor***

Fishing is a family business. At least one person per family fishes and owns a fishing net. There are fishmongers who are used as the “middle women” who link the fishermen to the fish processors and customers who want to buy the fresh fish. The fisherwomen can easily gain and control access to fishing, although maintaining a secure labor is rather difficult. There is a fishing ban on fishing and oyster harvesting, which prohibits the women to fish all year around. During the peak-oyster season, the women harvest the oysters three times a week.





**Picture 5: Women are harvesting oysters in the Densu Delta Wetland. Source: WaterPower (2018)**

Fishing is currently the only livelihood for most people in this community. During the past 10 years, the fish has been declining in all Ghanaian water bodies, thus leaving the women unemployed when the fish catch is low. During this time, the women need to find alternative employment opportunities. The women who have relatives or good relations within the community have easier access to find an employment during off-seasons. Typical employment opportunities are in the fish smoking business or trading vegetables and fruits. This occupation usually brings a lower wage.

In the last few years, many people from Northern Ghana migrated to this village (and this area in general) in need for a reliable labor. These people are usually employed as day-workers, who are generally young and remain landless in this area. However, there are also people from the Volta region who migrate to this area just during the peak fishing seasons and return back after non-fishing seasons for example to do some farming.

A hotel that is near one of the main fishing points seems to prohibit access to the main fishing points, especially during the peak tourism seasons. A wall was built to separate the hotel facility from the fisher village that does not allow the community to have a direct access to the wetland.

There is no leader of the community as it was in the past. There are no community rules or regulations in place. Fishing can take place at any time. The beach is polluted with liquid and solid waste, which contributes to the fish decline in the wetland.



Picture 6: Beach at Tsokomey. Source: WaterPower (2018)

### 3.3.7 Summary

Although the fisherwomen can easily gain and control access to labor, in practice, it is very difficult for them to maintain it due to a decline fish stocks. The access to knowledge and information improved with the establishment of the DOPA association. The NGO consults the women and gives them an opportunity for further trainings and education. Thus, the NGO holds control over what kind of information is disseminated and who is allowed to have access to it. Furthermore, there are certain actors in the region who prohibit the access to the lagoon (e.g. the hotel owner) and the access to the land in general, at the same time diminishing the production of ecosystem services. Lastly, people are migrating to this region in search of employment in the fishing sector, disregarding that the fish is currently severely declining in Ghana.

The women are highly dependent on ecosystem services for their well-being, but have little influence in decisions regarding the management and access to ecosystem services.

## 4 Where to from here?

As a next step, power relations that mediate access, use and distribution of ecosystem services could be addressed. There is a need to gain a better understanding of who controls access to the ecosystem services that especially support the livelihood of local population. Being able to inform ecosystem management, we need to look at institutional structures and analyze how



they affects ecosystem services, thus the well-being of the people. Additionally, this will help us to better understand the drivers behind ecosystem services change and their impact on human well-being (Berbés-Blázquez, González, & Pascual, 2016).

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Governance and Sustainability Lab

Faculty VI - Regional and Environmental Sciences

Prof. Dr. Antje Bruns

Trier University

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