

## The protective and destructive critical processes of female labor in small-scale fishing in coast Pernambuco, Brazil

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THEMATIC ARTICLE

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**Abstract** *This study aims to analyze the protective and destructive critical processes of 34 water women in the municipalities of Cabo de Santo de Agostinho and Ipojuca, Pernambuco, Brazil, from February/21 to August/22. The work process stages were systematized by the work flowchart, and we employed Breilh's critical processes matrix to organize the data. The destructive processes identified in the general domain were injustice and socio-environmental vulnerability, such as the economic development model, the Suape Industrial Port Complex, the 2019 oil spill crime disaster, the COVID-19 pandemic, and the difficult access to public policies; in the particular domain: overloads and extended working hours, use of rudimentary equipment and tools, and unequal gender, class, and race relationships; in the singular domain: physical and mental illnesses and deaths. The protective processes identified in the general domain were sustainable development objectives, public health, and social assistance policies; in the particular domain, group work and processing, consumption for subsistence; in the singular domain, fishing as a therapeutic, pleasurable, and sharing process. The study highlighted the central issues of the water women and the need to establish public policies targeting their care.*

**Key words** *Social determination of health, Fishing, Occupational health, Oil pollution, COVID-19*

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## Introduction

As a social activity, work is a process between people and nature, who, in order to adequately appropriate natural matter in a helpful way for their lives, set in motion their corporeality's natural forces, namely, arms and legs, head, and hands. By acting on external nature and transforming it through this movement, they simultaneously modify their nature<sup>1</sup>. Small-scale fishing is an example of this work process, as it establishes a direct relationship between society and nature, which permeates social relationships and recognition as subjects, directly affecting the quality of life and health-disease processes<sup>2,3</sup>.

These workers' knowledge and technical and cultural know-how are acquired from their ancestors and passed down from generation to generation. They own the instruments and tools of their trade, ensuring their self-employment. Small-scale fisherwomen do not sell their work capacity in exchange for a salary. They are not directly subordinated to capital, as they sell their work products, namely, fish or shellfish. Thus, they can preserve food sovereignty for their families and those who consume the small-scale fishing benefits<sup>2,3</sup>.

Gender relationships permeate the small-scale fishing work process and the sexual division of labor. In some small-scale fishing communities, historical processes and social constructions determine pre-defined roles for men and women, which leads to marginalized and invisible female workers in fishing activities<sup>4</sup>. As a result of historical and cultural relationships of machismo, these women have primarily been discontinuously inserted into farming due to the household's reproductive activities, which has consequently discouraged them from claiming their place at work<sup>5</sup>.

Women in small-scale fishing are involved in fishing for mangrove tree crabs, crabs, fish, and shellfish. We will use the term "water women" to highlight their struggles and resistance in the territories, showing the ancestry, belonging, and identity of water peoples because they bring memories, stories, knowledge, and the culture of this ancient activity, producing and reproducing life in the sea, mangroves, and rivers<sup>4</sup>.

The term "water women" includes fisherwomen in the group "water peoples", as defined by the National Health Policy for the Rural, Forest and Water Population (PNSPCFA): small-scale and riverine fisherwomen who build relationships with the environment<sup>6</sup>. It ratifies the ancestral involvement with the waters, where small-scale

fishing communities and families draw their sources of energy and strength for sustenance, work, faith, culture, and identity<sup>7</sup>.

It is essential to know the work processes and the social determination of health in the territories of small-scale fishing communities. Over the last 20-30 years, the economic development model adopted by Brazil has been based on accumulation by plundering and discrimination, which adopts unsustainable energy matrices in a logic of industries ranging from agribusiness to predatory tourism and real estate speculation. This model is permeated by conflicts and socio-environmental impacts, which destroy ecosystems and harm health, leading to violence and violation of rights, mainly affecting the way of life of small-scale fishing communities<sup>2</sup>.

Due to their resistance in the territories, their ancestry and their social reproduction of life from the sea, mangroves, and rivers, and because they are marginalized and invisible in fishing activities, water women are even more affected by territorial changes that generate negative impacts and socioenvironmental conflicts, which, in recent years, have escalated on the northeastern coast, particularly in the Pernambuco coastline<sup>4</sup>.

In light of the social determination of health, this article aims to present an analysis of the critical processes, protective and destructive, in water women's work of the south coast of Pernambuco, Brazil.

## Methods

This qualitative research is theoretically and methodologically anchored in the social determination of health, understood in the field of critical epidemiology as a tool for overcoming causalism in the health-disease relationship, recognizing health as a dialectical process of social reproduction in its general, particular, and singular dimensions, and the conception of the social-nature-biological relationship<sup>8</sup>.

The study territories were the municipalities of Cabo de Santo Agostinho and Ipojuca, located on the southern coast of Pernambuco in northeastern Brazil. These municipalities are among the three most affected by the 2019 oil spill<sup>9-12</sup>. Furthermore, they home to host the Suape Industrial Port Complex (CIPS), which has been responsible for the vulnerability and socioenvironmental conflicts with small-scale fishing communities in recent years<sup>10</sup>. The anchoring level comprised the communities of the beaches

of Gaibu/Cabo and Maracaípe/Ipojuca, selected because their groups of women are organized in active social movements in the territory.

Thirty-four water women were included, comprising 24 from Gaibu (Cabo) and 10 from Maracaípe (Ipojuca), aged 18 and above, and living in these communities. Data were collected from February 2021 to August 2022 using Participatory Rapid Diagnosis, which identified the social processes built with the participants<sup>13</sup>. A work flowchart was adopted to describe the small-scale fishing work process stages, identifying the tools used in fishing, from checking the tide phases and the right time for fishing/extraction to processing fishing products and selling them.

The flowcharts were structured in two workshops held at a social facility in the community. Each meeting lasted two hours and was guided by a semi-structured roadmap, with questions related to the small-scale fishing work, such as work process stages, duration, tools and instruments, personal protective equipment, fishing and extraction mechanisms, and methods, the best time to fish; how to get around; resting time; meals; fish processing; product marketing; work positive aspects; income obtained; food sovereignty aspects; autonomy and dignity aspects; and life promotion aspects<sup>13</sup>.

In order to gain a better understanding of the work process, the research team participated in an experience of the actual water women's work based on ethnographic strategies<sup>14</sup>. All the data were recorded in the field diary and using audiovisual resources. The data collected were then organized in the Critical Processes Matrix, based on Breilh's (2003) proposal. This is a schematic construction tool organized for strategic actions. It requires characterizing the health's protective and destructive processes, expressed in the dialectical movement in the general, particular, and singular domains, considering the subsumption and relative autonomy of one over the other<sup>15-17</sup>.

Diversity in the unity, arrangement, and hierarchization of health determination relationships are understood from the dialectical movement between the productive system's general domain, the particular ways of life's domain, and the singular lifestyle's domain, and the contradiction between protective and destructive processes, which have different directions vis-à-vis health, depending on the social conditioning factors at a given time and place.

Thus, protective (healthy) processes bring protection, "equity, maintenance, and better-

ment", defending the lives of individuals or communities, and destructive (sickening) processes bring "inequalities, deprivation, and deterioration"<sup>15,16</sup> (p. 209). Data were systematized considering the three domains of the critical processes: a) the general domain, which corresponds to the space-territory relationship, the production system, and State policies geared to fishing; b) the particular domain, which includes the work process, ways of life, and the intersectionalities of small-scale fishing communities; and c) the singular domain, which refers to the lifestyle and health-disease process of individuals and families<sup>15-17</sup>.

The Research Ethics Committee approved this study under the principles of protection to participants in scientific human research.

## Results and discussion

Chart 1 shows the aspects related to the general domain, where the health's destructive processes are linked to the capitalist system's structures, marked by unsustainable economic development and growing capital accumulation, which depletes finite natural resources and does not mitigate damage or waste, harm ecosystems, and pollute the sea, rivers and mangroves, spaces where water women produce and reproduce life, adversely interfering in the health processes of these women and their families and aggravating the socioeconomic and environmental vulnerabilities of these populations<sup>18</sup>.

In Pernambuco, CIPS, a cornerstone of capitalist production structures, negatively affects the territory of traditional small-scale fishing communities with the operation and expansion of production activities (refinery, thermoelectric plants, shipyards, and port-channel dredging). The Complex engenders deforestation, landfill, and destruction of mangroves, the deterritorialization and dispossession of families, pollution of water bodies, real estate speculation, and fostering predatory tourism. This process escalates violence, sexual exploitation, and drug trafficking<sup>19,20</sup>. Water women are affected by these processes and have reported their impacts on fishing, community health, and the environment, especially the oil refinery and the ore terminal near the shellfish gathering site.

Besides these processes, 2019 saw the most significant environmental crime on the Brazilian coast: an oil spill that affected more than 3,400 kilometers of coastline in the nine northeastern

**Chart 1.** Matrix of critical processes in the social determination of health.

Dimensions	Destructive processes	Protective processes
General: Productive System State policies Space-Territory	The capitalist development and production fossil fuel-based model; SUAPE Industrial Port Complex; The 2019 oil spill; Covid-19 pandemic; Difficulty in accessing public health and social assistance policies; Loss of local biodiversity; Real estate speculation in the region.	Sustainable Development Goals, in particular SDG 14; Public health and social assistance policies; Regulatory processes targeting small-scale fishermen (laws and ordinances); Unified Health System; The specific ecosystem/biome of the south coast of Pernambuco.
Particular: Work process Intersectionality Ways of life	No fixed working day; Work depends on environmental conditions (tide, climate, and moon phases); Women are responsible for reproductive tasks; Exertion due to heavy lifting, going fishing, and repetitive movements; Long hours of exposure to the sun and salty/polluted water; Work overload; Double and triple working shifts; Difficulty in accessing and using Personal Protective Equipment (PPE), sunscreens and repellents; Rudimentary equipment/tools for performing the work; Difficulty in finding suitable equipment for storing the products; Marketing the product at low cost; Need for other jobs to supplement income; Vulnerability in terms of food sovereignty; Unequal gender, class, and race relationships.	Work is done in groups; Snack/rest breaks; Products are processed in groups (cooking, picking, and sorting); Consumption for subsistence; Work with handicrafts; Participation in groups and social movements (Suape Forum, Women's Center of the Municipality of Cabo, Mangue Woman, CADI, and TPM); Participation in class associations.
Singular: Lifestyle Health-Disease	Non-acceptance of the use of some PPE; Use of self-medication; Use of inappropriate products such as repellent; Physical illness (genitourinary, musculoskeletal, dermatological - cancer and dermatitis, ophthalmological, cardiovascular, and respiratory disorders); Mental illness (depression and anxiety); Deaths by drowning.	The pleasure of sharing work with friends; Pleasure of fishing; Pride in being a fisherwoman; Use of health services; Use of medicinal plants; Fishing as a therapeutic process.

Source: Authors, adapted from Breilh (2003).

states and Espírito Santo and Rio de Janeiro. This crime disaster affected the places where the “water women” live, and their statements recorded the threats to the ecosystem and the vulnerability they have faced ever since. Fishing communities and the local population have been affected by the closure of beaches, hindering fishing activities and the sale of products and tourism activities, reducing family income, increasing unemployment, and impacting the food sovereignty of the region’s small-scale fisherwomen<sup>9,12,21,22</sup>.

Months after the crime disaster, the COVID-19 syndemic<sup>23</sup> began, which further intensified the existing vulnerability in the territory, in processes mediated by gender, race, and class relationships, evidenced by the elevated mortality in the North and Northeast regions and among black people, showing lower levels of socioeconomic development in these territories<sup>23</sup>. These findings were reinforced in the water women’s statements about the impacts of COVID-19 on their lives, materialized in the difficulties of fish-

ing and marketing the products during social distancing, domestic work overload, children care due to the lack of schools and nurseries, the care of sick family members, the increase in domestic violence, the need to earn an income to support themselves, and physical and mental fatigue.

Although most water women are self-employed, as they make their living from obtaining products from the sea, mangroves, estuaries, lakes, and lagoons, and their activities are included and linked to the legal framework of special insured persons for social security benefits, it is challenging for them to access social security benefits as special insured persons, which adversely influences their way of life and work<sup>24</sup>. We noted that the Small-scale Fishing Straw Hat Program (PCPPA)<sup>25</sup> in Pernambuco and the closed season insurance, which provides for the Small-scale Fishermen's Unemployment Insurance benefit (SDPA)<sup>26</sup>, were not guaranteed for most of them, as they did not have the General Fishing Registry (RGP) or registration protocol required to be granted the benefit, nor did they have formal links with the fishermen's colonies, fishermen's associations, or cooperatives.

The findings of this study corroborate information from the Pernambuco State Planning and Management Secretariat<sup>25</sup>, which points out that only 4,337 of the 41,487 workers who received benefits in 2021 were small-scale fishermen. These benefits favored a few small-scale fisherwomen since, according to data from the Environment and Sustainability Secretariat (SEMAS) regarding fishing entities, 12,556 fisherwomen lived on the Pernambuco coast<sup>27</sup> during the 2019 oil disaster, and these figures are underestimated.

Identifying health-protective processes revealed strategies to counter the capitalist production model, particularly establishing specific public policies and government strategies. The Sustainable Development Goals (SDGs) are an instrument for "a global call to action to end poverty, protect the environment and climate, and ensure that people everywhere can enjoy peace and prosperity"<sup>28</sup>. Goal 14 of the SDGs is relevant to this study: "Life on the water, which proposes the conservation and sustainable use of oceans and marine resources for sustainable development"<sup>28</sup>, due to the direct connections and the urgency of thinking about the health of ecosystems.

Within the framework of the Unified Health System (SUS), the Brazilian state grounds "health as a right of all and a duty of the State" from the perspective of assuring rights to public policies in order to achieve social, cultural, linguistic,

ethnic, and racial plurality in the country. The PNSIPCFA is a process to protect water women's health under the SUS, structured from the health inequalities and needs, with strategies for health promotion and prevention for the rural, forest, and water populations and surveillance actions<sup>8</sup>.

The Brazilian constitution already guarantees quilombola and Indigenous communities. The National Policy for the Sustainable Development of Traditional Peoples and Communities (PNPCT) was established for greater protection. It aims to "recognize, strengthen and guarantee their territorial, social, environmental, economic and cultural rights, appreciating and respecting their identity, organization, and institutions". In order to establish action strategies for this policy, it was necessary to develop a definition of a traditional community, which considers the identity characteristics of the peoples, their access to land and use of the territory's resources, and their production model<sup>29,30</sup>.

In small-scale fishing communities, water women are fundamental to keeping tradition and traditional knowledge alive. From this perspective, the National Policy on Sexual Rights and Reproductive Rights (PNDSDR) and the National Policy on Comprehensive Women's Health Care (PNAISM) are protective processes. These policies target healthcare, promotion, and prevention, highlighting gender issues, as they understand that social relationships between men and women are socially constructed and based on established social roles and attributions, the axis of inequalities in most societies<sup>31,32</sup>.

Another protective aspect is the Brazilian Fisheries Law, which establishes the National Policy for the Sustainable Development of Aquaculture and Fisheries (PNSAP), broadening the scope of professionals in the small-scale fishing sector, including the small-scale fishing activity the "work of making and repairing fishing gear and tackling and processing small-scale fishing products", performed mainly by women, including them in the fishing production chain<sup>33</sup>. Since then, more women have been involved in the activity due to greater visibility and social and political recognition<sup>5</sup>.

The structures of the capitalist system of economic development are unsustainable as they destroy natural resources and escalate the impacts on the communities of water women, primarily when associated with the lack of capillarity of public social assistance policies, which are extremely important and should guarantee dignified living conditions. Thus, they compromise

aspects of the particular dimension related to the sovereignty of traditional small-scale fishing communities (ways of life and work) and the singular domain regarding the Healthy Being (lifestyle and health-disease) of water women, evidencing their subsumption relationship. These data align with Arendt's critical review of Marx, who linked an individual's metabolism to that of work on nature itself, pointing out that work is incorporated into the subject in a cycle of finite reproduction of the means of subsistence, leading to destruction<sup>34</sup>.

In the particular dimension (Chart 1), which expresses the production and reproduction of water women's lives and traditional small-scale fishing communities, one of the destructive aspects is related to the tide variation. Its daily variation does not allow for a fixed working day or the delimitation of the working day into "conventional" hours since nature, the tide, and moon cycles<sup>35</sup> determine time. Knowing the weather's complex variations is crucial in fishing communities<sup>36</sup>. The "big tide", a term used by water women to refer to the high tide, increases the working area in the place they choose to fish, thus increasing the hours they work extracting shellfish or fishing for crab and mangrove tree crabs and consequently causing more effort and repetitive movements and more prolonged sun exposure and water contact. Other destructive fishing aspects are the extraction and handling stages, which pose several occupational and environmental risks to workers<sup>35,36</sup>, observed in other studies<sup>35-39</sup>, and the work flowchart detailed in another article of this study<sup>40</sup>.

In the "displacement" stage, which occurs at the "fishing/shellfishing" site, they walk or by motorless raft; in "shellfishing", they stand in the water, flexing their torso, while making repetitive movements with their upper limbs, using the "scoop net"; in "mangrove tree crab fishing", in which they stand upright, with their torso erect and their body in the mud, or sit on "anchor roots".

Besides these destructive processes, they need flexible working hours and often a supplementary income from secondary or seasonal work to ensure socioeconomic conditions for the family and perform their work. The triple workday and overload have a direct impact on the singular domain, the health-illness processes, with physical illness (musculoskeletal and cardiovascular) and mental illness (depression and anxiety), with recurrent self-medication. During this long working day, reports of pain, illness, and accidents

reveal body strategies, myths, interpretations, identity, and belonging<sup>36</sup>.

Another destructive aspect concerns the unequal gender, race, and class relationships. Gender oppression is evident in the invisibility and marginalization of the small-scale fishing production process since fishing work is recognized by society as an exclusively male task. Men are assigned the roles of physical strength, provider, and courage; women are responsible for reproductive tasks, caring for the home, children, and partners, and demarcating the triple working day<sup>41</sup>. Water women report that, in the fishing labor division, the activity performed on the high seas is mostly done by men, and women do the extraction and scavenging work.

In the capitalist and patriarchal system, men exploit and dominate women, causing them historical oppression. Colonization's legacy represents specific gender, racial, and territorial exploitation modes since "the subordination of women, nature, and colonies as the motto of 'civilization' inaugurated capitalist accumulation and laid the foundations for the sexual and colonial division of labor"<sup>42</sup>.

These elements gain strength within the debate on racialization that has resumed in Latin America since the 1980s, during the resurgence of the Black movement in Brazil, which brought up issues such as diaspora, racialization, and gender<sup>43</sup>. Women's resistance in defense of their conditions of existing corroborates the "force-idea of body-territory", confronting the "exploitation of territories under neoextractivist modalities" and contemporary labor exploitation reconfigurations, "mapping the consequences generated by the plundering of common goods in everyday life"<sup>42</sup>.

Regarding socioeconomic conditions, it is challenging for water women to access Personal Protective Equipment (PPE), such as sunscreen and adequate clothing, to perform their work. Extensive working hours with prolonged exposure to the sun and the use of unsuitable repellents such as cooking oil and kerosene have a direct impact on the singular domain, causing physical illness such as hyperthermia, heatstroke, dehydration, syncope, visual disorders (cataracts, keratitis, and conjunctivitis), cramps, skin diseases (premature skin aging, skin cancer, dermatitis, mycoses, and other dermatophytoses and onychomycoses<sup>44</sup>.

The use of equipment and tools to collect crustaceans and mollusks, often handmade and rudimentary<sup>37</sup> were observed. There is also little

use of machinery, as most boats are rafts with oars and sails, which depend on body strength, leading to problems such as musculoskeletal injuries affecting the singular domain (Chart 1).

Furthermore, inadequate product storing and processing means are adopted, leading to low-cost sales and further stimulating the need for a supplementary income to guarantee the family's food security. With insufficient production and no conditions for preservation and storage, the product needs to circulate more quickly, leading these women to look for quicker sales alternatives and, consequently, depend on traders or intermediaries and, to a certain extent, limit their autonomy in the production process<sup>37</sup>.

Another critical aspect directly impacting the singular domain (Table 1) is staying in the water. Immersed in water up to their waists, in the reefs, they remain until all the buckets are full or until the tide starts to rise. When in the mangrove, women commonly infiltrate the mud up to their waists to collect crabs, mangrove tree crabs, and oysters, leading to genitourinary and respiratory disorders, exposure to chemical agents, and work accidents such as drowning, accidents with venomous and stinging animals, which can result in death<sup>36,38</sup>. In this study, women highlighted problems related to the urinary and genital system, skin involvement, and osteoarticular disorders, also evidenced by studies<sup>37,44</sup>.

These elements highlight the discrepancy in the relationship between occupation and health damages, indicating the restricted perception of women's health to reproductive issues, disconnected from the way of life of water women. Although they report going to health services as a protective aspect in the singular domain, these illnesses evidence the difficulty of accessing the healthcare network and the need to look at occupational health surveillance towards these workers<sup>38,39</sup>.

Among the protective processes in the particular dimension is collective organization. Most of the work process stages in small-scale fishing are shared and may involve members of the same family and neighbors. By working together, they share ancestral knowledge of nature and preserve the fishing tradition. Tide cycles allow for the practice and development of skills in the shellfishing trade<sup>36</sup>. Small-scale fishing is based on family organization as a production system inscribed in traditional cultural practices, a local and durable network with tasks and labor divisions, establishing solidarity and cooperation modes. It organizes and mobilizes the workforce

in family relationships, and solidarity simultaneously governs family organization and traditional work processes<sup>36,38</sup>.

These aspects directly impact the particular dimension when the pleasure of sharing work with friends, fishing, and the pride of being a water woman are highlighted. This issue can be understood based on the idea that women involved in small-scale fishing have their knowledge of the trade, which is expressed in the symbolic universe of beliefs, values, and myths learned through a centuries-old cultural heritage inscribed in traditions of a way of thinking and doing the work, which contributes to the social reproduction and positively affects the health of these women and encourages the use of traditional care practices such as medicinal plants<sup>37</sup>.

Another crucial protective process in the particular dimension is the still low water women participation in class association. For example, movements such as the National Articulation of Fisherwomen (ANP), created in 2005 by small-scale fisherwomen from all over Brazil, which, in contrast to machismo and racism, gives visibility to the work of these women, acting in defense of traditional territories and encouraging labor, social security, and other public policies<sup>7</sup>. An essential element to consider in the singular dimension, where health-disease manifests, is understanding that the individual corresponds to a social group, connected to system structures. In this sense, it is impossible to stop looking at subsumption relationships between the general, particular, and singular dimensions while considering the relative autonomy, knowing they strongly influence<sup>15,16</sup>.

## Final considerations

The social determination of the health of water women, their families, and the communities where they produce and reproduce life cannot be seen as the sum of critical processes but as the dialectical movement that occurs between these processes, which enables us to understand the health-disease process and the search for concrete solutions to the problems that permeate these territories. For a profound transformation of a decent, healthy, and guaranteed rights life, we should recognize water women as fishers and as a collective, a traditional small-scale fishing community entitled to territory, food sovereignty, and guaranteed access to access public policies.

Research has highlighted the way of life of water women, their families, and communities, unraveling the critical processes of the social determination of health. We identified the social and environmental vulnerabilities, injustice, and conflicts that they face, resulting from megaprojects, such as CIPS, the 2019, oil crime disaster, the COVID-19 syndemic, and the destructive processes in the small-scale fishing work, such as extended working day, effort, and work overload, and the difficulties of a decent work that keeps the fishing traditionality.

We aimed to contribute to incorporating the social determination of water women's health in the debate on the complex interrelationship between gender, race, and class by inserting an approach that favors, from the nomenclature used, the intersectional dimension in data analysis. The gender system itself starts from the racialization and dehumanization of women, especially those with lasting economic oppression and threats to their territories. It is necessary to face these determinants to achieve access to comprehensive health and dignified living conditions.



## Collaborations

MG Flores, MOS Santos, IGD Gurgel and BC Peixinho actively participated in the work's conception, design, and drafting, and data collection; analysis and discussion of results; and critical review and approval of the final version of the manuscript. MM Nepomuceno, ACLV Medeiros, EF Nascimento and AM Gurgel contributed to the work's writing; analysis and discussion of results; and critical review and approval of the final version of the manuscript.

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