

Climatic and environmental issues, evolving migratory intentions and projects



Case study of coastal and artisanal fishing in the regions of Zarzis and Boughrara



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Introduction

“The sea is not a forest.” This is how S.K.¹ describes maritime space in Tunisia and in Zarzis. The Mediterranean Sea has its own standards, traditions, culture and laws that regulate it, it is a societal, social, economic and civilizational dynamic, and it is the narrative and history of nations and societies. According to the French historian Fernand Braudel, traveling in the Mediterranean Sea means “finding the world of the Romans in Lebanon, the prehistoric monuments in Sardinia and the Greek cities in Sicily, the Arab presence in Spain, Islam as left by the Turks in Yugoslavia, and the Mediterranean means immersing in the deepest depths of the centuries gone by during which the Bold buildings were erected in Malta and the Pharaonic pyramids in Egypt. It also means finding very old monuments that are still alive, adjacent to very modern and stylish ones...”². Despite its rich history and economic significance, this sea has turned into a chaotic environment where individuals act according to their own desires and the strong prey upon the weak. With the rise of contemporary neoliberalism and the expansion of industrialized societies, the sea has become a hub for unregulated fishing and a dumping ground for waste, including transboundary and transnational pollutants.

The issue of climate change, which can be both natural and induced by human activity, has made things more complicated. In 1992, 190 countries signed the first climate change treaty during the Third Earth Summit. This agreement was created in response to the political pressure that already existed at the time to limit the inevitable increase of carbon dioxide in the Earth’s atmosphere through state interventions. Since then, the definition of climate change has changed. It has shifted from its usual meaning of “climate is changing” to a new one: “Recent climate change caused by humans.”³ The causes of climate change are linked to human actions, but the impact and consequences of climate change vary greatly depending on the relationship between countries

1 Interview was conducted on May 8, 2023 at ten o’clock in the morning at the headquarters of the Environmental Development Association of the Sea in Zarzis with S.K, an actor at the Environmental Development Association of the Sea in Zarzis and a sponge fisherman at the fishing port of Zarzis.

2 Fernand Braudel, *The Mediterranean*, translated to Arabic by: Omar Ben Salem, Alif, Mediterranean Publications, Tunisia 1990, p. 8.

3 André Desrochers, **Conserver le climat ? Penser la conservation de l’environnement**, Les Presses de l’Université Laval, 2022, pp 163-194. P 164.

in the North and South. The people in the South seem to be the most affected by climate change, despite contributing less to its formation compared to the countries in the Global North. This is due to factors such as social status, class, and gender.

The fishing community is facing several challenges, such as climate change, pollution, and overfishing. These problems have created a divide between the small-scale coastal fishers and the large-scale commercial fishers. The latter are often associated with indiscriminate fishing practices that contribute to the destruction of marine ecosystems. CH. B⁴ used the term “poor fishing” referring to small-scale coastal fishing, while “fishing terrorism” is used to describe large-scale indiscriminate fishing, which is often carried out by large shipowners. Unfortunately, the sea in Zarzis and Boughrara has become polluted due to the activities of some large shipowners, pirates, and militias. Climate change and environmental degradation have far-reaching consequences, particularly in communities that rely on marine resources for their livelihoods. The situation is made worse when large shipowners take over these resources, exacerbating existing problems of poverty, exclusion, and marginalization⁵. This also leads to the failure to integrate affected communities, such as small-scale seafarers, into national and international policy-making processes.

Climate change not only affects human societies but also has implications for ecosystems, wildlife, and marine life. This, in turn, affects the management and familiar use of culturally and economically important marine and terrestrial species and resources. As a result, societies need to adapt and exercise resilience to climate change. It may also require the “relocation” of humans, animals, and plants to adapt to change and deal with its repercussions. In some cases, the state may be unable to adapt or resist the effects of climate change. In such situations, migration to other spaces may be one possible solution to “settling” people in a place where they can live out their dreams.

Climate change and environmental injustice affect not only local communities but the entire world. Many politicians have recognized the urgency of addressing climate change and have included it in their election or mobilization campaigns. Climate change is frequently featured in news headlines, magazines, and social media. Its impact on

4 Interview conducted on May 12, 2023 at half past ten in the morning at the fishing port of Zarzis, with Ch, B, owner of a coastal fishing boat and an actor at the Association of the Seas Environmental Development in Zarzis.

5 Susan Carte, Mark Nuttal, **Anthropology and climate change: From encounters to actions**, Left Coast Press, Inc, California, 2009. P 12.

various social phenomena is significant, and this study aims to avoid a superficial explanation of the relationship between climate change and migration.

Between December 17, 2010 and January 14, 2011, a new era of representative Tunisian democracy began, which unfortunately ended prematurely after just 10 years, due to rampant social banditry and political deception.

On the Tunisian Republic Day in 2021, President Kais Saied took the decision to dissolve the parliamentary body, and pave the way for a new political journey, with a new constitution, parliament, structures, and laws.

Amidst all the significant sociological and political changes that have occurred recently, the coastal and traditional fishing communities of Zarzis and Boughrara are advocating for better economic, social, and professional conditions. They are also calling for the prevention of ships that damage marine ecosystems and for solutions to stop some of the practices of Libyan pirates and militias. These demands are justified, especially at a time when most countries worldwide are experiencing climate changes that have affected agricultural and marine wealth. Many seas and oceans have been adversely impacted by companies that emit pollutants and contribute to climate change.

Despite the political changes that have taken place in Tunisian society since 2011 and July 25, 2021, the demands of the fishing community have not been fully met, leading to ongoing suffering. This has caused feelings of disappointment and frustration to escalate, as the Mediterranean Sea no longer provides enough resources to meet the social and economic needs of coastal and artisanal fishing sailors in Zarzis and Boughrara. Moreover, climate change and environmental injustice have become major threats to marine and fisheries wealth, which are crucial sources of livelihood for many Tunisians. Unfortunately, these vulnerable communities have been disproportionately affected by these challenges.

I. Research questions and hypotheses of the study

Based on the above and linked to many sub-questions and research status, the central problem of this study is the following:

To what extent can climate change, environmental injustice and the depletion of fish wealth through indiscriminate and illegal fishing be considered factors that have contributed to the development of projects and migratory intentions, whether for coastal and artisanal fishing

sailors or for their children and families in a context where seafarers are trapped in a maritime desert due to the unfair division of borders and the transformation of the sea into a hotbed for some pirates, and in a circumstance in which the response of the Tunisian state was slow and almost non-existent?

To what extent did the economic and social crises faced by the coastal and artisanal fishing communities in Zarzis and Boughrara contribute to the decision to migrate, considering that these two societies have a strong tradition of migration and well-established local community networks?

The research hypotheses are linked to the central problem, and the cultural, societal, and economic specificity of the study population. It suggests that climate change and the environmental crisis on the beaches of Zarzis and Boughrara have been the key factors in the formation and development of individual and family migratory intentions. This is due to the sea becoming a hotbed for indiscriminate fishing and piracy, and in a political environment where the state has been unable to address the problems related to the coastal and artisanal fishing sector.

The economic and social crisis plaguing the coastal fishing community of Zarzis and Boughrara is the main factor that paved the way for the formation and development of migratory intentions at a time when the Mediterranean Sea is undergoing climate change and environmental crisis and in a context in which the study community is characterized by the strength and robustness of local social networks and historical traditions and culture of migration.

After identifying the problem and presenting hypotheses regarding the challenges faced by the fishing industry in Tunisia, particularly the coastal fishing sector in Zarzis and the artisanal sector in Boughrara, this study aims to address these challenges. It also aims to investigate the link between climate change and environmental degradation, as well as the relationship between project development and migration intentions.

II. Why study the fishing community?

Fisheries and aquaculture are central to global food production. Industrial fishing accounts for 65% of the world's catch, while more than 90% is engaged in artisanal fishing. Thus, it is the industrial fishing boats that have a monopoly on fishing at the global level.⁶

6 Azzam Mahjoub, Mohamed Mondher Beghith, **La sécurité et la souveraineté alimentaires et le droit à l'alimentation en Tunisie**, FTDES, 2022. P 103.

Fishing is a crucial aspect of Tunisia's economy. The country's vast coastline spanning over 2,100 km, along with 37,000 km² of coastline and 124,000 km² of fishing zones, has allowed it to establish a significant fishing industry since its independence in 1956. The government invested in a large fleet and port infrastructure to bolster the industry, and it has paid off. Fishing contributes 7.5% to the value of agricultural production and 15.2% to agricultural exports.⁷

Fish production in the governorate of Medenine is primarily dependent on coastal fishing and blue fishing, which together amount to 96% of the total production. Other forms of fishing, such as traction, sponges, and oyster collection, represent less than 1% ⁸ of the total production. However, oyster gathering has not been practiced on the beaches of Zarzis and Boughrara since 2017. In 2018, the production of fisheries and aquaculture in the governorate of Medenine was about 14,078 tons, which ranks fifth nationally after Monastir, Mahdia, Sfax, and Nabeul. The production saw a sharp decline from 18,496 tonnes in 2017 to 14,078 tonnes in 2018. Despite the decline in production, the value of fishery products increased from 127 million dinars in 2017 to 150 million dinars in 2018.⁹

The fisheries sector in Tunisia plays a vital role in the country's economy and is especially important in the state of Medinen. Over 100,000 people rely on this sector, which provides an average of 11.5 kg of seafood per capita annually. However, Tunisian fisheries face numerous challenges, including overexploitation of bottom fisheries, pollution, and illegal fishing¹⁰. Climate change has also added new threats to the sector, including sea level rise, high temperatures, and acidification of marine waters. Extreme climate events such as floods, heat waves, and storms on land have serious consequences for the sustainability of Tunisia's fishing activity¹¹.

The local communities of Zarzis and Boughrara have a long-standing history in the fisheries sector and are adversely affected by climate

7 Céline Deandreis et al, **Impacts des effets du changement climatique sur la sécurité alimentaire**, Tunisie- Contribution aux éléments de la phase préparatoire du processus du plan national d'adaptation (Axe 2), Agence Française de Développement, 2021. P 79.

8 Hervé Bru, Marouane Chikhaoui, **Chaîne de valeur pêche et aquaculture dans le gouvernorat de Mednine : Cartographie et plan d'action à court et à moyen terme**, UE, programme IRADA, 2020. P 10.

9 Ibid. P 9.

10 Céline Deandreis *et al.*, **Op.cit.** P 79.

11 Ibid.

change, environmental pollution, and overfishing. In recent years, particularly after 2011, Zarzis has become a hub for irregular migration, which has led to the formation of protests and struggles against unfair national and international migration policies. Unfortunately, the peninsula has become a graveyard for migrants. These events, linked to climate change and ecosystem degradation, have motivated us to focus on the fishing communities of Zarzis and Bougherara. It is a crucial geographical space that serves as a staging point for migrants, and fisheries play a significant role in world food production.

III. Port Infrastructure, Labor and Fishing Fleet in Zarzis

As of 2020, Tunisia has a total of 41 seaports and coastlines along its coast, with 8 of them being fishing ports located in the governorate of Medenine. These ports, which include Zarzis, Houmt Souk, El Kef, El Qurain, Hassi Djellaba, Agim, Boughrara, and Aghir, have significantly boosted the fishing sector. This has resulted in a significant increase in the national fish production, which has contributed to the country's food security. Zarzis port, which was established in 1978 and extended in 2002, is the main port of the wilaya of Medenine. It has the most complete facilities, and it is situated at the southern end of the eastern coast, southeast of the city of Zarzis. The port is equipped with essential refrigeration and storage equipment, including five refrigerated complexes¹². The fishing fleet in the governorate of Medenine represents about 21% of the national fleet, with 2823 units in Medenine for 13541 units at the national level. The fleet mainly consists of shore fishing and blue fishing¹³.

In the context of industrial fishing, there are three main types of boats: fishing boats (402 units nationally, with two units situated in the port of Zarzis), sardine boats (373 units nationally, with 26 in Zarzis), and fishing nets. On the other hand, coastal fishing units are the most crucial part of the fleet in the governorate of Medenine, and at the national level. The number of motorized boats ranges from 700 to 800 (5000 at the national level), while the number of units without engines is approximately 1500 (6500 at the national level).¹⁴

12 Hervé Bru, Marouane Chikhaoui, **Op.cit.** P 12.

13 Ibid. P 13.

14 Ibid.

As of April 2023, there are a total of 900 coastal fishing boats in the fishing port of Zarzis. Out of these, 220 are motor boats with a sailing range of about 20 miles or 1.8 km, and the other 680 are non-motorized boats with a range of about 5 miles. It is worth noting that no new coastal fishing licenses have been issued in Zarzis since 1995¹⁵. According to data from the Southern Development Office in Medenine for the year 2020, there are a total of 1043 coastal fishing boats in the area, out of which 286 are motorized and 775 are non-motorized.

In terms of employment, the governorate of Medenine is the second largest employer in the fishing sector after Sfax, with about 8,845 workers. Coastal fishing is the leading provider of jobs with 6,541 workers, and Zarzis alone has about 4,000 seafarers¹⁶. The largest concentration of fishing units is located in the port of Zarzis, and the governorate of Medenine offers all types of fishing.¹⁷

IV. Women working in the fishing sector in Boughrara region

Boughrara women play an important role in the fishing business, as they are involved in the processing of fishing equipment and collecting oysters, which is one of the most important livelihoods for women working in the fishing sector. The number of women working in the fishing sector in the governorate of Medenine is about 3,000 among the 2,000 oyster collectors, of whom only 19 have a professional card and 1,000 women work in the manufacture and maintenance of nets¹⁸. Most of the women working in oysters hail from Sidi Makhlouf and Boughrara¹⁹. Oysters are exported specifically to Italy and Spain. The oyster collection activity runs from October to April from seven in the morning until three in the afternoon, and each of them collects about two kilograms of oysters for a wage of 8 dinars, well below the national minimum wage²⁰.

15 Regional Delegation for Agricultural Development in Medenine: Department of Fisheries and Fish Farming in Zarzis.

16 Ibid.

17 See Appendix No. 1, P 88.

18 Regional Delegation for Agricultural Development in Medenine: Department of Fisheries and Fish Farming in Zarzis.

19 Interview conducted on May 8, 2023 at 11 a.m. at the Regional Delegation for Agricultural Development of Medenine: Department of Fisheries and Fish Farming in Zarzis, with S.K in charge of the Department of Fisheries and Fish Farming in Zarzis.

20 آمنة بن كحلة، دراسة حول صغار البحارة ووضعية الصيد الساحلي في جرجيس وقرقنة وطبلية، المنتدى التونسي للحقوق الاقتصادية والاجتماعية، 2021، ص 10.

V. Research Techniques

1. Quantitative data processing

When collecting quantitative data, we used a “snowball” sample technique. This method involves identifying an individual from the original community and asking them to introduce the researcher to others, thus expanding the researcher’s knowledge of the community²¹. We initiated the quantitative research process by contacting one of the coastal fishing sailors and an activist from the Environmental Development Association of the Sea in Zarzis. Through them, we were able to reach 203 individuals who completed questionnaires. It’s worth noting that this sample size represents 5% of the coastal fishing community in Zarzis, which consists of about 4,000 seafarers according to data from the Regional Commission for Agricultural Development in Medenine on the values of fishing and fish farming in Zarzis. The fieldwork and questionnaire filling took place over the first half of May 2023.

Quantitative data has been complemented with direct observation and guided conversations to increase comprehension.

2. Qualitative Data Processing

When it comes to data processing, qualitative observation can be a powerful tool²². It’s a natural behavior that we all engage in every day, and through direct observation, researchers can uncover not only common daily activities, but also the specific activities they’re interested in studying²³. In our case, we used direct observation to study the fishing industry in Zarzis, focusing on the coastal fishing sailors and their related vocabulary. We applied this technique both at the fishing port and at the fishing school in Zarzis.

Although direct observation technology has many advantages, it does not provide access to certain information that requires the knowledge

21 محمد در، أهم مناهج وعينات وأدوات البحث العلمي، مجلة الحكمة للدراسات والتربوية والنفسية-مؤسسة كنوز الحكمة للنشر والتوزيع، الجزائر، 2017، ص 309، 325، ص 316.

22 Jean- Pierre Olivier de Sardan, **La rigueur du qualitatif : Les entretiens empiriques de l’interprétation socio- anthropologique**, Academia Bruylant, Louvain- La- Neuve, France, 2008. P 66.

23 Hiroko Norimatsu, Pascal Gazenave- Tapie, **Techniques d’observation en Sciences humaines et sociales**, Congrès international Société d’Ergonomie de Langue Française, 2017, Toulouse, France, pp 529- 532. P 531.

and memory of local actors. Therefore, local actors' representations are essential elements to understand any society. Interviews are a distinctive and often more economical means of producing discursive data that allows access to popular and local representations²⁴. In other words, "interviews are a great way to learn about attitudes and values of a society²⁵."

Regarding our interview process, we utilized semi-guided conversation technology and conducted a total of 19 interviews²⁶. To gather information about women working in the agricultural sector, we spoke with eight women who perform tasks such as sewing, maintaining and patching nets, collecting oysters, and working in a fish trap making workshop. For the remaining three women, we conducted interviews on March 10th and 11th, 2023, during the National Conference of Women Workers in the Agricultural Sector in Hammamet, organized by the Tunisian Forum for Economic and Social Rights. All other interviews and field observations, like those in Hammamet, occurred during the first half of May 2023 in the city of Zarzis and the Boughrara region.

VI. Presentation of the features and characteristics of the questioned sample

In Zarzis, during the first quarter of May 2023, 203 questionnaires were distributed and completed by fishermen in the coastal fishing sector. This period was specifically chosen as it is the shrimp season, which was confirmed by the fishermen. During this season, it was easier for the researcher and work team to find many sailors in the fishing port of Zarzis as they only sail for a limited period of time. After their nets are filled with shrimp, which typically takes between 12 to 24 hours, they usually return directly to the port. This facilitated the data collection process. The questionnaires were filled out in both the fishing port of Zarzis and the Jedaria area of the delegation of Zarzis.

24 Jean- Pierre Olivier de Sardan, **Op.cit.** P 54.

25 Russell Bernard, **Research methods in Anthropology: Qualitative and Quantitative Approaches**, Fourth Edition, Oxford, 2006. P 413.

26 It is divided between 11 males and 8 females. Males hail from the Zarzis region and are distributed as follows: 6 coastal fishing sailors, including two activists in the Seafarers' Environmental Development Association in Zarzis. Active in the Association of the Seas for Environmental Development and owner of a recreational fishing boat, two executives at the School of Fisheries in Zarzis, and two executives at the Regional Commission for Agricultural Development in Medenine: Department of Fisheries and Fish Farming in Zarzis.

1. Distribution of sample by gender

100% of respondents are male. The fishing space in Zarzis is highly masculine, and the women who own a coastal fishing boat are about 10 but do not work at sea²⁷. In a sociological study on the place of women in male professions, a number of respondents consider the term “male professions” to be a fad created to restrain women and not deviate from the customs and traditions of our conservative society²⁸.

In the same study, some respondents expressed support for women working in male-dominated professions, regardless of customs and traditions. However, other respondents, both male and female, believed that women should have the right to work but not in male-dominated professions. They argued that such professions make women similar to men and cause them to lose their femininity. Additionally, they argued that women have a different physiological nature than men, such as a thinner physical structure, which makes it difficult for them to engage in such professions. Respondents who worked in male-dominated or harsh professions also rejected women’s participation in these professions, citing the “division of domestic work” thesis. They believed that a woman’s work in male-dominated professions would prevent her from fulfilling her duties as a mother and wife, resulting in poor child-rearing. Moreover, respondents provided other intellectual and ideological justifications for their position²⁹. In light of this, M.S. argues that the lack of women working on boats and at sea is a reflection of outdated mentalities³⁰. For his part, M.A. said: “The process in Zarzis is a societal process and not circulating, and the Zarzis Sea is a difficult sea and loves to endure energy, and women can endure but not like men.”³¹

These data refer to the concept of hegemonic masculinity: “a set of gender principles and practices that legitimize domination and make it acceptable in a society. Among these principles we refer to the criteria

27 To the Regional Delegation for Agricultural Development in Medenine: Department of Fisheries and Fish Farming in Zarzis.

28 سلمى برنيص، مكانة المرأة في المهن الذكورية: المجال العسكري مثالا، رسالة بحث لنيل شهادة الدكتوراه في علم الاجتماع، إشراف: سهام النجار، كلية العلوم الإنسانية والاجتماعية بتونس، جامعة تونس، 03 نوفمبر 2020، ص 107.

29 Ibid., pp. 118, 119, 120, 121.

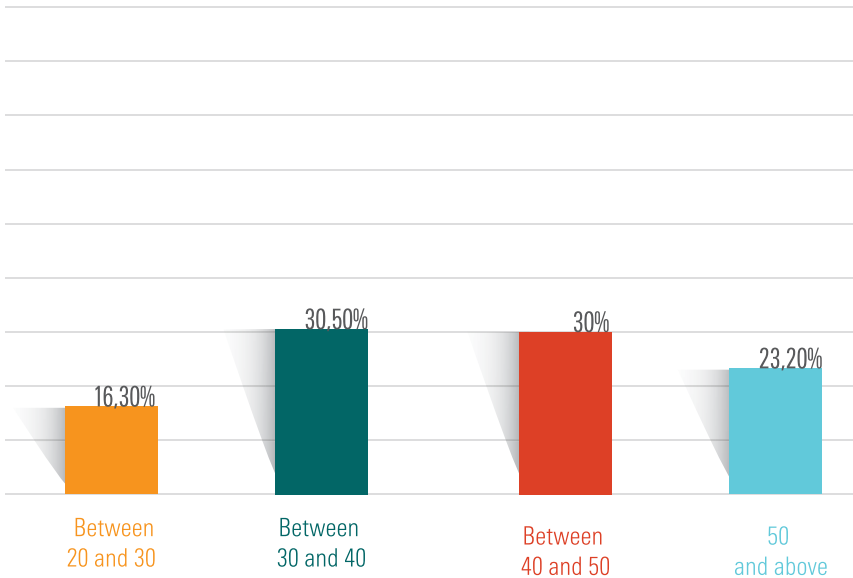
30 Interview, conducted on May 11, 2023 at ten o'clock in the morning in Boughrara, with M., Sh., 22 years old woman and owner of Lamiaa workshop for packaging and making fish traps in Boughrara.

31 Interview conducted on May 7, 2023 at 6 pm at Beghine Café in Zarzis with M.A, an actor at the Association of the Seas Environmental Development in Zarzis.

of power, wealth and power, as well as age and race.”³² It should be noted that the masculinity of work and space is not a matter specific to the fishing sector, whether in Zarzis or in other regions, but it is a matter and a problem that is still stuck in the Tunisian societal structure and in many Tunisian institutions and sectors, especially those sectors that males consider difficult professions, such as mining sectors, especially within phosphate sections and sinks (or laundries).

2. Sample questioned by age group

Chart 1: Distribution of the questioned sample by age



Source: Fieldwork.

When visiting the fishing port of Zarzis, it’s noticeable that the industry is not attracting young people. As shown in Diagram 1, the average age of workers in the coastal fishing sector is fairly high. This trend can be attributed to the unattractive nature of the work for young people, as they are not willing to work in this sector. We will explain the reasons behind this later.

3. Distribution of sample by civil status

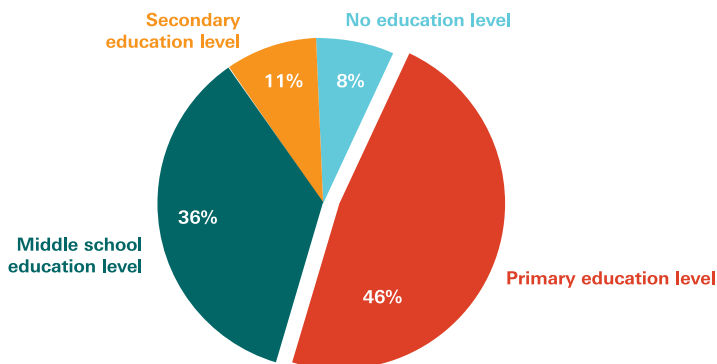
The majority of the respondents (53.20%) fall under the age group of forty and above. Due to this, it is not surprising that most of them are

32 رضا كارم، البائع المنتصب في سوق نهج إسبانيا بين ذكورة الأتمودج وذكورة الآخر، في سوق نهج إسبانيا أو منهاج الاقتصاد الشارعي في التونس: مقارنة سوسيو أنثروبولوجية، تحرير وتنسيق: سفيان جاب الله، المنتدى التونسي للحقوق الاقتصادية والاجتماعية، 2022، ص 171-198، ص 178.

married (62%). However, due to the challenges faced by the coastal fishing sector, a significant number of seafarers are unmarried (30%). According to the seafarers interviewed, their source of livelihood no longer provides for their basic needs and does not allow them to start a family. In the sample, 8% of the respondents are divorced.

4. Sample questioned according to educational level

Chart 2: Distribution of sample by educational level



Source: Fieldwork.

The fishing port in Zarzis is home to a number of skilled sailors. However, it appears that individuals with university degrees are not interested in working in the coastal fishing sector. Based on the sample group, we did not come across any sailors who had completed university education. Most of them had completed only primary, basic and secondary education. Uneducated individuals constituted only a small percentage, around 7%.

5. Social coverage according to the sample questioned

Based on the statistics provided by the Tunisian Union of Agriculture and Fisheries, only 12% out of the 54,000 seafarers in Tunisia have social security³³. Further, according to the respondents, only 46% of seafarers have social coverage, while the remaining 54% are not covered by any social benefit scheme.

6. Inheritance of profession and job in the fishing sector

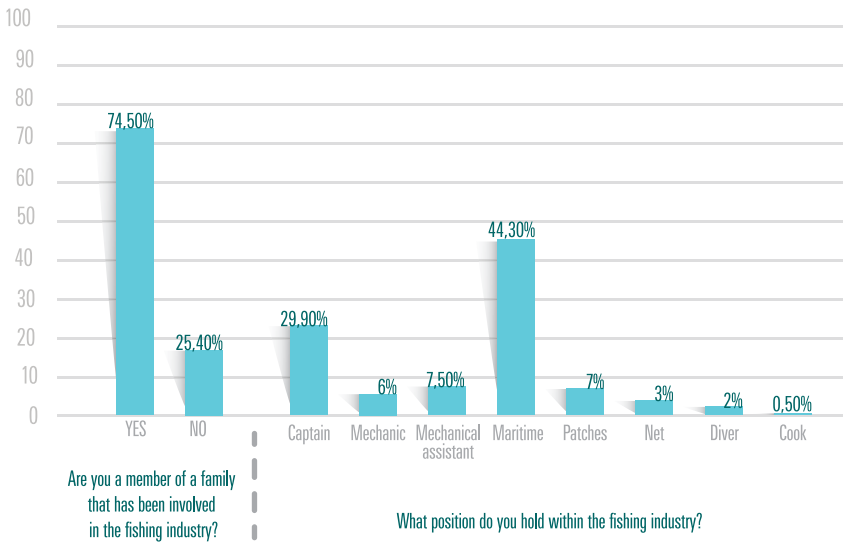
The Zarzis fishing community has a long-standing tradition of passing down fishing skills and knowledge from one generation to the next. This is due to the fact that many of the citizens of Zarzis have been involved

33 أمانة بن كحلة، مرجع سابق، ص 10.

in fishing for over a century, leading to the development of fishing-related customs and an increase in the number of sailors. In 1905, there were 315 Zarzis sailors, which increased to 717 by 1930³⁴. Even in more recent times, when 74.60% of respondents came from families

that worked in the fishing sector, these traditions continued to some extent. Fishing is therefore considered a genetic activity in Zarzis. Those involved in this sector have various roles, from captain to cook, but most of the respondents (44.30%) work as “Bahri”, which is a worker in the fishing crew.

Diagram 3: Genetic activity and function in the fishing sector according to the sample questioned



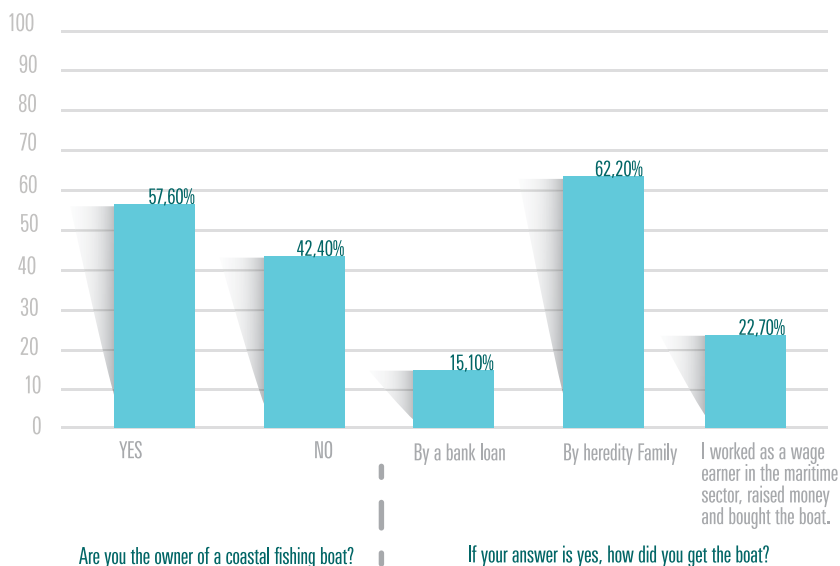
Source: Field work.

7. Boat owners and how to obtain them according to the sample questioned

The surveyed sample had 57.60% of boat owners, but only 29.90% were captains. This paradox shows that boat owners are not necessarily captains, as they may work different jobs during fishing trips. However, the inheritance of the profession and boats has contributed to the continuity of the coastal fishing sector. Also, 22.70% of respondents became professional boat owners by saving money from their wage-earning jobs, while some sailors had to borrow money to buy boats.

34 سالم الأبيض، تاريخ شبه جزيرة جرجيس من العصور القديمة إلى نهاية الاحتلال الفرنسي: دراسة اجتماعية تاريخية في التاريخ المحلي، تقديم: نور الدين سريب، الشركة العامة للطباعة سوجيم، تونس، 2001، ص 165.

Chart 4: Ownership of coastal fishing boats and method of obtaining them according to the sample questioned



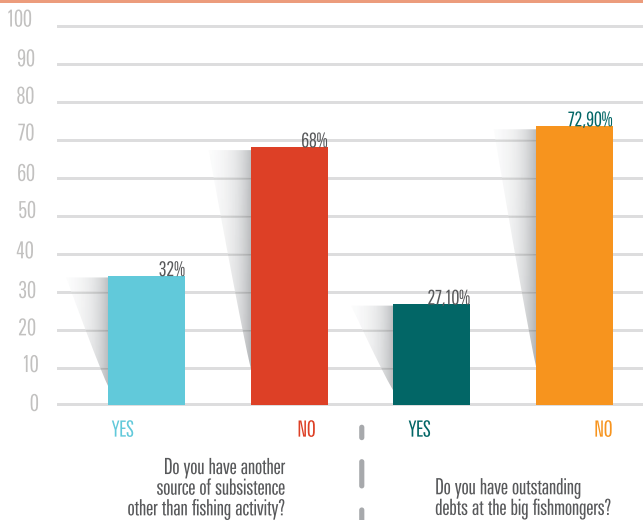
Source: Field work.

8. Debt and multiple livelihoods according to respondents

With the economic and social conditions deteriorating, and the lack of state support for the coastal fishing sector, some seafarers resort to borrowing and incurring debt. Those who don't have enough resources to sail and fish are forced to borrow from big fish traders. Debts often serve as incentives that push the seafarer to sell his boat to displacement networks. We will discuss this further in detail.

For many coastal fishing seafarers, the sector no longer provides sufficient social and economic benefits, so fishermen struggle to find work and other means of livelihood to meet their subsistence needs.

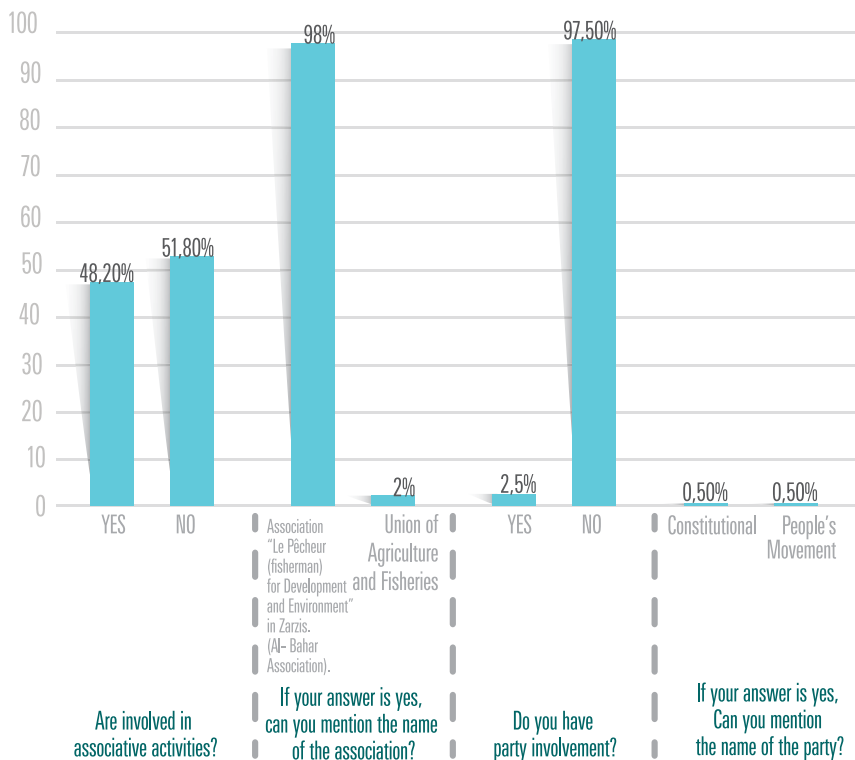
Chart 5: Other livelihoods and debts incurred according to the sample questioned



Source: Field work.

9. Associative and political involvement of coastal fishing sailors in Zarzis

Chart 6: Participants in associative and political work according to the sample questioned



Source: Field work.

The Association for Seas Environmental Development in Zarzis has played an essential role in society by providing training courses for seafarers. Additionally, this organization has been striving to establish meanings and concepts that aim to achieve social justice in the region, whether it be for the benefit of seafarers or the region as a whole. Their efforts are commendable, and their mission to build a framework that promotes social justice deserves recognition.

The association has been actively involved in migration issues, particularly since the boat sank in Zarzis on September 21, 2022. The bodies of the deceased were buried in the cemeteries of the Gardens of Africa without any genetic analysis. Therefore, the association has been working to mobilize and organize local protest movements to uncover what happened to the boat and find those who are missing or lost³⁵. Due to its strong reputation within the local community, the association was able to establish a high social and societal status, which in turn attracted many seafarers. In contrast, the peasant union failed to gain the trust of coastal fishing sailors in Zarzis. When it comes to political involvement, coastal fishing sailors in Zarzis tend to avoid participating in political parties and organizations, especially given the current trend towards populism.

35 For further reading about the Zarzis movement, the reader can refer to: Khaled Tababi, Khaled Tabbabi, **Floating bodies and drifting souls: The absurdity of burial and the state of contempt. (The tragedy of the Zarzis peninsula)**, Translated from Arabic by; Hajer Araissia, FTDES, 2022.

Chapter I:

The impact of climate change on the socio-economic conditions of coastal and artisanal fishing seafarers

Introduction

Throughout history, climate change may have occurred naturally. However, for decades, many politicians, actors, and researchers have been warning the world about climate change. In recent years, there has been an increasing public, private, and international interest in this issue. Several international reports have confirmed that climate change is not a natural phenomenon but is caused by human activities, as highlighted in the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) released in 2007³⁶.

Due to natural causes and human activities, such as the escalating burning of fossil fuels and the resulting increase in greenhouse gas emissions - mainly carbon dioxide and methane - we are witnessing various climate phenomena in real-time. These phenomena include global warming, reduced rainfall, sea level rise, ocean acidification, and more frequent and severe storms and floods.

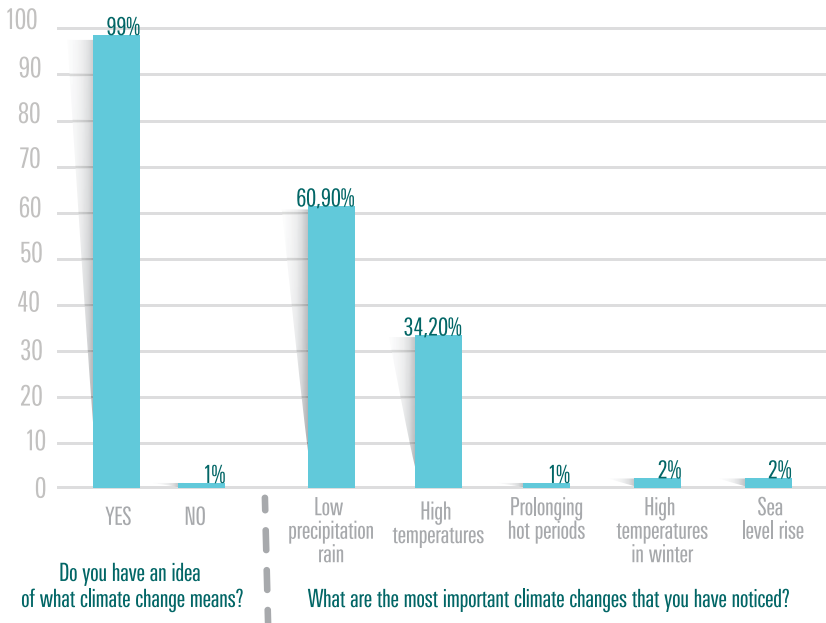
In this context, the chapter examines the climate changes in the Mediterranean Sea, especially in the southern fishing zone of Tunisia, and the impact of these changes on the economic and social life of the coastal fishing sailors in Zarzis and the artisanal in Boughrara. Can climate change contribute to the fragility of the socio-economic conditions of the study population? How can we explain this?

36 IPCC Fourth Assessment Report: Climate Change 2007. IPCC.
<https://www.ipcc.ch/languages-2/arabic/publications-arabic>

I. Fishing community observation of climate change

Before addressing questions related to climate, economic and social conditions, fisheries and the migration decision, we wanted to know whether coastal fishing sailors in Zarzis noticed climate changes, and if so, what are the most important phenomena they observed, so that the answer is as in the figure below.

Chart 7: The extent to which the fishing community knows about climate change and the phenomena they observed according to the sample questioned



Source: Fieldwork

To truly understand climate, one must utilize their “sociological imagination.” This is a term coined by American sociologist Wright Mills, who believed that it allows us to “see the relationship between individuals’ lives and the effects of greater social forces.”³⁷ Essentially, sociological imagination allows us to think about things socially, recognizing the connection between personal problems and public issues, as well as between the individual and society as a whole³⁸. While climate change might initially seem like a personal issue, it is actually a public one that affects everyone. Even if only one person is personally impacted by climate change, it has a ripple effect that affects the entire globe. This is why we must view climate as a collective and global issue, rather than

37 <http://tinyurl.com/3rwr77tr>

38 Ibid.

an individual one. The observations made by seafarers show that climate change is a public issue that requires global attention and action.

The time period during which fishermen started noticing changes is varied. According to the survey, 45% of respondents believe that climate change began only 5 years ago. The survey reveals that 33.70% have noticed changes from 5 to 10 years ago, 9.90% saw them 10 to 15 years ago, 6.40% from 15 to 20 years ago, while 5% believe that climate change has been happening for 20 years or more.

These answers emphasize that it's impossible to limit a certain period to the onset of climate change, but there is a consensus that the climate began to change at least 5 years ago.

Moreover, the survey found that 96% of the respondents consider climate and environmental changes to be very serious, while 3% believe that the changes are dangerous and only 1% consider them as natural changes.

II. The impact of climate change on the decline of marine wealth and crops and socio-economic conditions

1. Impact of Rising Temperatures on Marine Wealth and Economic Conditions

It is important to highlight that in November 2020, Mediterranean experts on climate and environmental change published the first Mediterranean Assessment Report³⁹. This report addresses the issue of climate and environmental change in the Mediterranean basin. The region is experiencing significant changes in temperature, rainfall, sea level rise, salinity, and acidification of seawater. The impact of these changes is expected to worsen over the next few decades, particularly if global warming exceeds the pre-industrial level of 1.5 to 2 degrees Celsius. Therefore, it is crucial to intensify efforts to adapt to and mitigate these inevitable changes. Climate change is causing severe and tense extreme events, which are leading to an increase in soil salinization, ocean acidification and land degradation. These factors are adversely affecting both land and marine production activities. According to the report, most agricultural crops will experience a decline in yields in the years to come, especially in the current production areas. This situation will be further exacerbated by pests and pathogens. Unsustainable fishing practices, the invasion of non-native species, global warming,

 39 <http://tinyurl.com/ye7zk92n>

acidification and water pollution are also posing a threat to marine food production. Furthermore, if corrective actions are not taken, by 2050, more than 20% of marine fish⁴⁰ and exploited marine invertebrates may face local extinction⁴¹.

According to forecasts, the temperature in Tunisia is expected to rise by 1.1°C by 2030 and 2.1°C by 2050 compared to the reference period of 1961-1990. This rise in temperature is likely to result in more frequent and severe droughts by 2030, with significant variations in the amount of rainfall received in different seasons⁴².

Experts predict that there will be an increase in temperatures between 0.8 and 1.3 degrees Celsius by 2030, and this increase will be more pronounced in continental regions with seasonal changes and increasing heat waves in summer. Additionally, there is likely to be a 5 to 10% reduction in average annual rainfall. This climate change will impact water, food, biodiversity, and health, and will have negative effects on livestock⁴³ and fisheries⁴⁴. The table below shows the temperature changes in Tunisian surface waters from the 1980s until the end of the century.

Table 1: Summary of the evolution of the current sea surface temperature, by 2050 and the end of the 2100th century in Tunisia

Time horizon	1980	2020	2050	2100
Surface water temperature in the northern fishing zone	19.0- 19.4 C°	19.8- 20 C°	20.4- 20.8 C°	21.8- 22.4 C°
Surface water temperature in the central fishing area	19.6- 20.0 C°	20- 21 C°	21.2- 22 C°	22.2 – 23 C°
Surface water temperature in the southern fishing zone	20- 21 C°	21- 21.6 C°	22.6- 23 C°	23.2- 23.8 C°

Source : Céline Deandreis et al, *Op.cit.* P 81.

40 Marine invertebrates are multicellular animals that lack spines and live in the marine environment such as sponges, sea worms, mollusks etc.

41 Azzam Mahjoub, Mohamed Mondher Beghith, *Op.cit.* P 116.

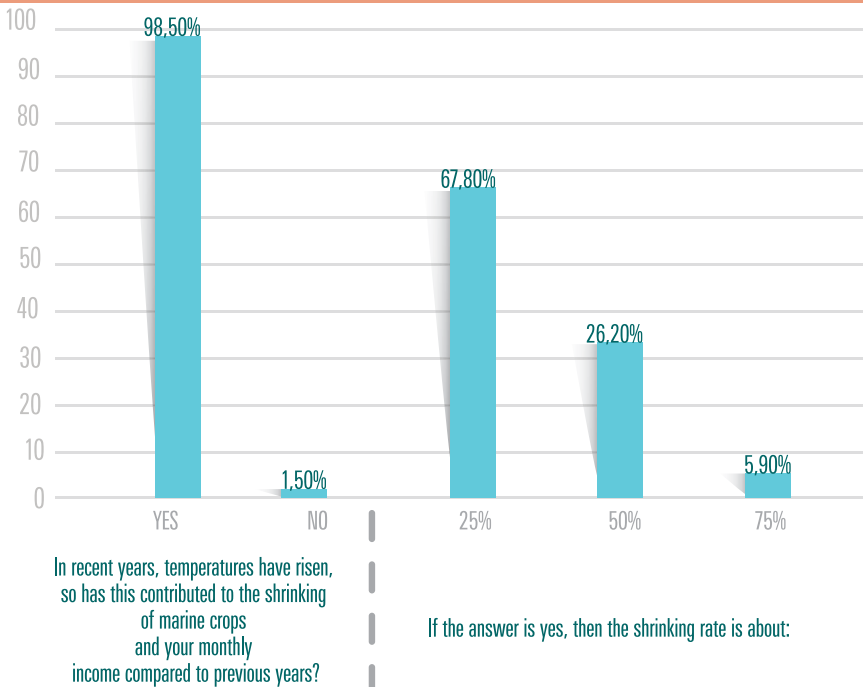
42 Abdelala Bounouh, Sonia Gsir, **Migrations et environnements en Tunisie : Relations complexes et défis pour le développement**, Organisation Internationale pour les migrants, Tunis, 2017. P 90.

43 Ali Bouattour, **Les changements climatiques et leurs impacts sur le secteur de l'élevage au Maghreb, Santé et environnement dans le bassin méditerranéen**, Académie Tunisienne des Sciences, des Lettres et des Arts, Beit al-Hikma, Tunis, 2011. P 94.

44 Céline Deandreis et al, *Op.cit.* P 79.

The increase in surface water temperature causes the thermal line to deepen⁴⁵, which has a significant impact on marine habitats, biodiversity, and marine resources, including those utilized by fishing⁴⁶. The ongoing trend of rising temperatures poses a risk of heat stress that may further intensify in the future, greatly disturbing fisheries resources⁴⁷. Studies have shown that the rise in temperature in the three fishing areas (northern, central, and southern) will not be uniform, and the Gulf of Gabes is expected to be the most affected area. By 2050, the sea surface temperature in this region is expected to range from 20.4°C to 20.8°C, and by the end of the century, it is projected to range between 21.8°C and 22.4°C⁴⁸. The increase in water temperatures is a crucial factor in predicting fish productivity and economic conditions for coastal fishing communities. The fishermen in the Zarzis region recognize the correlation between rising temperatures, the deterioration of their economic situation, and a decline in marine resources.

Chart 8: Relationship of temperature rise to shrinking marine crops according to the sample questioned



Source: Fieldwork.

45 La thermocline.

46 Céline Deandreis et al, **Op.cit.** P 80.

47 Ibid.

48 Ibid.

Through field interrogations and from Chart 8, it is clear that rising temperatures have negative effects on the socio-economic conditions of fishermen in Zarzis. M.A. explains. The idea of the impact of rising temperatures on the coastal fishing community by saying: “The fishing industry along the coast is one of the sectors that is greatly impacted by climate change. In late October 2022 and the beginning of November of the same year, the temperature in the sea rose to 6 degrees higher than its normal rate. This period coincides with the octopus fishing season, as these sea creatures approach land and near the stones during this time for reproduction and renewal. However, if the sea temperature is too hot, it becomes difficult for the octopus to reproduce, causing them to die. Consequently, they do not approach the land for reproduction which has a significant impact on their survival. Female octopuses carry eggs inside their bodies, and if they breed near the shore, they produce and give birth to offspring at a rate of about 80%, while in the deeper parts of the sea, this rate drops to around 30%. The soya species is also impacted by climate change, as it is a marine species that thrives in cold water and is adversely affected by warmer temperatures.”⁴⁹

Sponges also appear to be one of the most important marine resources affected by climate change and rising temperatures.

2.Sponges: historical wealth diminished by climate changes

S.K. explains that sponge fishing has been a significant profession in Zarzis since ancient times, passed down to the current generation by their Greek ancestors who operated boats without engines⁵⁰. On the other hand, the President of the Association of the Seas for Development and Environment in Zarzis, during the opening of the 51st session of the International Sponge Festival in Zarzis, highlights that the sponge sector is a traditional and cultural heritage inherited from their forefathers. They have worked to develop the sector through training courses that focus on its development, transforming it into a professional sector instead of just a traditional one. This has been achieved by conducting training at a depth of 60 and 70 meters⁵¹.

49 Interview with M, A, already mentioned.

50 Interview with S. K, already mentioned.

51 A speech delivered by the President of the Association “Le Pêcheur (fisherman) for Development and Environment ” in Zarzis. (Al-Bahar Association), Shams Eddin Bourassin, on the occasion of the opening of the 51th session of the Zarzis International Sponge Festival.

These two testimonies refer to the historical value that this wealth occupies in Zarzis society. Zarzis has been known for this type of marine production for at least a century and the region has attracted foreign sailors who specialize in sponge fishing since 1875, such as the Maltese and Italians⁵². Throughout history, sailors have been interested in fishing sponges on the coast of Zarzis on about 140 km, where in 1888 about 130 boats were allocated for sponge fishing⁵³.

Despite gaining independence decades ago, sponges remained a crucial source of income for Zarzis sailors. However, the production quantity of sponges fluctuated greatly depending on the season and year. In this context, N.B. stated that during the first half of the 80s, he used to obtain around 400 kg of sponges each season, sometimes even up to 600 kg, and sold them at a rate of 22,000 dinars per kg. However, since 1986, the sponge population has been declining, and although it partially recovered in the early 90s, the quantity of sponges harvested was significantly lower. For instance, in 1994, N.B. was able to harvest only 285 kg of sponges, which were sold for 100,000 dinars⁵⁴.

In recent years, from 2012 to 2017, N.B. has been able to collect only around 150 kg of sponges per season, sometimes even between 100 and 150 kg. N.B. earns 50% of the production, which means that if he gets 100 kg of sponges in a season, 50 kg will be his profits. It is worth noting that the boat owner bears the expenses of the fishing trip, including food expenses⁵⁵.

While production quantities have fluctuated, prices are closely tied to productivity, and N. B. explains: "In 2000, the price of one kg of sponges increased by 350,000 dinars, rising in 2019 to 640,000 dinars, and in 2022 it fell to 500,000 dinars per kilogram, with a noticeable decrease in quantities."⁵⁶

The decline in prices and this marine wealth leads to a deterioration in the social status of fishermen, says S.K. "Previously, sponges met the

52 سالم الأبيض، مرجع سابق، ص 165.

53 عبد الرحمن الوينسي، أحد ملامح الأنشطة الاقتصادية بجرجيس: تطور قطاع الصيد البحري 1887-1929، في شبه جزيرة جرجيس عبر التاريخ، جمعية المحافظة على التراث بشبه جزيرة جرجيس، 1995، ص 54.

54 The sponge season lasts 10 months per year, and sailors stop fishing during April and May, interview with S. K, already mentioned.

55 Interview conducted on May 9, 2023 at one o'clock in the afternoon at the Begin Café in Zarzis with N, B Sponge Fisherman in the fishing port of Zarzis.

56 Interview with N. B, already mentioned.

social and economic needs of sponge fishermen, but since about 2017 this wealth has declined.⁵⁷ “ According to data available at the Regional Commission for Agricultural Development in Medenine, this wealth has witnessed a significant decline since 2020, and Table 2 shows the extent of the decline of this marine species.

Table 2: Evolution of sponge production in the port of Zarzis during the years 2019, 2020 and 2021

Year	2019	2020	2021
Production in Tons	9.5	3	0.3

Source: Regional Commissariat for Agricultural Development of Medenine

Sponges suffer from global warming for several years causing many families who rely on the sponge trade to despair. In 2017, after temperatures rose to 24 degrees Celsius at a depth of 67 meters, many sponges died⁵⁸. A.S. explains: “The decline in sponges wealth is due to climate changes, especially the heat of the weather, as sponges do not live at great depths and therefore do not tolerate prolonged periods of high temperatures, and do not tolerate the heat of sea water, and there is also pollution, which comes mainly from the chemical complex in Gabes, and it seems that there are germs that harmed it and there is infection in the sea, but there is no scientific study confirm or deny this so far.⁵⁹”

The high temperatures have had a detrimental effect on the economy and society of the Zarzis coastal fishing community. Climate change is causing the migration of both terrestrial and marine species towards the polar regions, which is impacting the availability of warmer water types and reducing cooler water types. This phenomenon is expected to occur at a faster pace for fish populations in marine pelagic fish, who will need to move to deeper waters to resist rising surface temperatures⁶⁰. Additionally, sea level rise is another climate phenomenon that has emerged as a result of rising temperatures and melting ice in the oceans.

57 Interview with S. K, already mentioned.

58 Sophie- Anne Bisiaux, Marco Jonville, **Des pêcheurs pris dans un étau**, FTDES, Le 06/12/2019.

59 Interview conducted on May 8, 2023 at two o'clock in Zarzis with A.S. Cadre at the Regional Commission for Agricultural Development in Medenine: Department of Fisheries and Fish String in Zarzis.

60 The State of World Fisheries and Aquaculture 2010, Special Studies Highlights pp. 117-122, P 119.

3. Risk of sea level rise

Although only 2% of the study sample observed climate changes associated with sea level rise, this does not prevent it from saying that many researchers have confirmed the formation of this phenomenon. Sea level rise results from a simple physical consequence of rising average temperatures and melting glaciers. Measuring sea level rise remains complex due to two phenomena: the rise or fall (or even sinking) of land masses and the absolute change in sea level⁶¹. According to experts from the Intergovernmental Panel on Climate Change, global sea levels will rise at an alarming rate over the next eighty years. . This increase at the end of the century will reach between 0.28 and 0.61 million according to the optimistic scenario and 0.52 to about 1 million under pessimistic conditions of high greenhouse gas emissions. However, the degree of sea level rise still depends on the altitude and magnitude of impacts collected at local sites. The low-altitude Gulf of Gabes will therefore be more affected by sea level rise⁶². This phenomenon poses (or will be) a real threat to fishermen's livelihoods. This table provides a summary of sea level rise in Tunisia's three fishing zones.

Table 3: Summary of sea level rise in cm compared to the reference year 1980 in Tunisia

Year	1980	2015	2050	2100
Northern fishing zone	-60 - -42 cm	=2- 5 cm	= 5 – 7 cm	= 15 – 25 cm
Central fishing area	-50- -45 cm	=2- 5 cm	= 7 – 10 cm	= 15 – 25 cm
Southern Fishing Zone	-65 - -42 cm	=5 – 7 cm	= 15 cm	= 25 – 30 cm

Source : Céline Deandreis et al, *Op.cit.* P 82.

4. Ocean acidification effect

Seas and oceans have an alkaline⁶³ pH level of 8.2, but various forms of pollution can alter their chemical composition and water quality. Acidification estimates in the Mediterranean are rare, but due to its

61 André Desrochers, *Op.cit.* P 184, 185.

62 Céline Deandreis et al, *Op.cit.* P 81.

63 Alcalins alkaline water is relatively less acidic than regular drinking water while the pH of natural water is 7, alkaline water has a pH of 8 or 9.

semi-enclosed nature, it is highly sensitive to the increase of carbon dioxide in the atmosphere. Consequently, it is one of the most affected regions in the world by acidification⁶⁴.

Acidity is linked to carbon dioxide emissions because part of this gas dissolves in the oceans, and it is estimated that about a third of carbon dioxide emissions from human activities will end up in ocean waters⁶⁵. Once in the water, carbon dioxide reacts with other molecules and produces acids. The series of available data confirms that over the past two decades, acidity has increased by 10%. According to forecasts, the pH will reach a value of 7.7 by the end of the century, an increase of 0.07 to 0.13 units versus the 0.04 units currently observed. Continuous pH measurements in Tunisia are scarce or even non-existent, as the buoys obtained for the coastal observatory do not take this criterion into account despite their consequences for water quality and certain fishing and collection activities⁶⁶. The increasing acidity of oceans poses a significant threat to marine life and fisheries, which may lead to a decline in the economic and social conditions of the fishing community. Changes in temperature and atmospheric convection are not isolated events because oceans and seas interact with the atmosphere, acting as huge chemical stores of carbon dioxide. It is estimated that the oceans absorb half of the net increase in carbon dioxide in the atmosphere to form carbonate, which makes them slightly less basic in principle. The balance of carbon dioxide uptake in the oceans can vary greatly as the atmosphere warms because the solubility of carbon dioxide decreases when it warms. But the oceans act not only as huge chemical stores, but also as time attenuators due to their enormous heat capacity. Thus while fluctuations in ocean temperature can almost immediately lead to changes in the temperature and dynamics of the atmosphere for a few years or even decades, the opposite is not true. It may take decades for large changes in the atmosphere or solar radiation to translate into measurable changes in ocean dynamics or temperature⁶⁷.

Similar to rising temperatures, rising sea levels and ocean acidity, coastal fishing sailors in Zarzis are exposed to other extreme weather phenomena that have harmed their economic and social situation, namely the phenomenon of escalating sea storms.

64 Céline Deandreis et al, **Op.cit.** P 83.

65 André Desrochers, **Op.cit.** P 186.

66 Céline Deandreis et al, **Op.cit.** P 83.

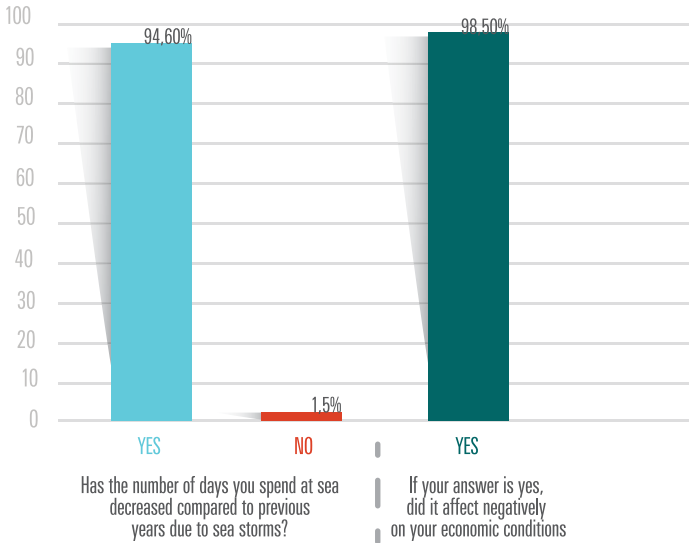
67 André Desrochers, **Op.cit.** P 176.



5. Rising sea storms and worsening economic conditions for the coastal fishing community

Severe storms can be very dangerous for fishing activities. Special weather forecasts provide information on the number of times when it's not safe to go to sea. The National Institute of Meteorology data shows that the northern sector of Tunisia has seen a 30% increase in severe weather forecasts compared to 17% and 12% in the eastern and southern regions respectively, when compared to the reference period of 1980. If these storms keep occurring, fishing yields will decrease⁶⁸. To understand the impact of these storms on the economic and social situation of coastal fishing sailors in Zarzis, we examined the relationship between the frequency of sea storms in recent years and their extent.

Chart 9: The relationship of marine storms to the decline in economic conditions according to the sample questioned



Source: Fieldwork

The profitability of seafarers in Zarzis has been significantly impacted by sea storms in recent years. This has resulted in a situation where the seafarers' years of experience are no longer sufficient to accurately predict weather and climate conditions. CH.B. explains, "In the past, we were familiar with the Nawa (strong winds) and could anticipate weather shifts based on our expertise and professional experience. However, now we are left in uncertainty due to the negative effects of pressure and pollution. Without technology, it has become difficult to predict the weather. Interestingly, the

68 Céline Deandreis et al, **Op.cit.** P 83.

weather forecast often indicates favorable conditions for sailing, but we frequently encounter unexpected storms and powerful winds. It seems that science is sometimes unable to fully comprehend and control the weather. As a result, the number of days spent at sea has been reduced due to the prevalence of storms and winds.”⁶⁹

During trawling, small pelagic fish and coastal fishing, strong winds can cause fishermen to experience more frequent and longer periods of downtime. Unfortunately, this climatic phenomenon has a negative impact on fishing effort, resulting in a decrease in the number of days spent at sea per year. However, there is a positive effect in the form of “biological comfort,” which allows for the replenishment of fish resources and ultimately leads to an improvement in the quality of catches⁷⁰.

It is important to consider that during turbulent weather conditions, where storms and strong winds are prevalent, it is necessary for boats to return to land quickly. In response to this, 73.30% of respondents have opted to integrate more powerful engines in their boats or the boats they work on. This is because powerful engines allow for faster sailing and quicker return to land, which is crucial in times of weather turbulence.

In the face of climate changes and a significant decrease in certain marine species, coastal fishing sailors in Zarzis are compelled to adapt to their changing economic and social circumstances. To combat the decline, these seafarers actively seek out fishing locations that are abundant in fish and marine resources.

6. The relocation of fishing grounds and the decline in the economic and social conditions

N.B. has been an experienced sponge fisherman in the fishing port of Zarzis for several decades. Throughout his extensive career, he has acquired valuable knowledge and insights about various fishing locations in the area. Some of the notable areas where they used to sail and fish include Little Benkako - Misiwa, although caution was exercised due to concerns about Libyan sailors. Another significant location was the vast Messiwa, which unfortunately became inaccessible for fishing after 2011 as it came under the ownership of the Libyans. Additionally, the Bank of Barani, situated in the northeast, was another area frequented by N.B. and his fellow fishermen. Other notable fishing spots mentioned by N.B. include Didon Company and Fara Mustafa, located in the Djerba region⁷¹.

69 Interview with CH, B, already mentioned.

70 Céline Deandreis et al, **Op.cit.** P 88.

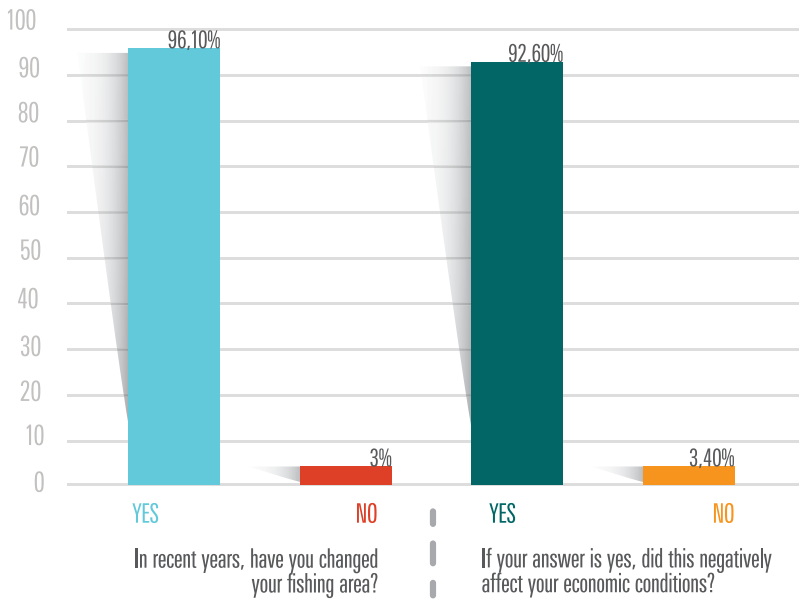
71 Interview, with N. B, already mentioned.



In a climatic circumstance that led to the decline of some marine and fish species, these areas no longer meet the social and economic needs of coastal fishing sailors in Zarzis, but more than that, the miles near the shores of Zarzis have become semi-arid areas of marine wealth, M.A. explains: "Previously, we used to sail a few miles or even near the shores and find marine wealth, but this has become difficult, if not impossible, during these years."⁷²

Coastal fishing sailors in Tunisia are being forced to search for new fishing areas due to climate shifts and the decline of certain marine species. As a result, the fishing community is experiencing frequent changes in their fishing locations. However, according to the questioned sample, this semi-permanent change has negatively impacted their economic, social, and living conditions.

Chart 10: Changing the fishing area and the extent of its negative impact on the economic conditions of fishermen according to the sample questioned



Source: Fieldwork

Frequently changing the fishing area necessitates extensive sailing in order to search for a means of sustenance in the depths of the Tunisian seas. This prolonged sailing, spanning over several days, poses a significant detriment to coastal fishing sailors due to the substantial expenses and exorbitant cost of gasoline. Consequently, an imbalance

⁷² Interview with M. A, already mentioned.

arises between the costs incurred and the profits generated. CH.B. highlights the predicament, stating, "Within coastal fishing, the scarcity of work and productivity has compelled us to rely on the impact of soaring prices and stagnant rates. For instance, shrimp prices have remained constant for four or five years, with the current selling price being 50 dinars. However, each year witnesses a surge in equipment and gasoline prices, preventing us from achieving a harmonious equilibrium between cost and production."⁷³

Changing the fishing area and sailing long distances can be financially burdensome for coastal fishing sailors. This can lead to a situation where these sailors may fish not only to make a profit but also to recoup their initial investment or even suffer losses. According to S.M., the decline in marine and fish species such as octopus and cattlefish has forced fishermen to venture further away from the coast. Previously, they could catch these marine resources just 6 miles away and return to land within an hour. However, now they have to sail about 20 to 30 miles, and even then, they often struggle to find enough fish. The expenses incurred during these five days of sailing, including gasoline and food, amount to a significant sum of 3 million dinars.

It is worth noting that the financial outcome of these fishing trips varies, with some trips only covering the costs, others yielding a small profit, and occasionally resulting in a loss⁷⁴.

The coastal fishing category in Zarzis has suffered economic and social damage due to climate change and the pursuit of marine wealth, resulting in a mismatch between cost, production, and profits. Despite an increase in productivity in some areas, fishermen's net income remains insufficient or even negative due to high fishing equipment costs and the high cost of living. This has led to a decline in the purchasing power of seafarers, as noted by researcher Amna Ben Kahla⁷⁵.

The decline in fishermen's profits in the coastal fishing sector has been evident, with the emergence of invasive and new species, particularly the blue crab. It is crucial to consider the impact of this marine wealth on the sailors of Zarzis and the women employed in the Drayen workshops. Are there any repercussions that can arise from these species? Furthermore, is it possible for these marine species to serve

73 Interview with CH. B, already mentioned.

74 Interview conducted on May 12, 2023 at nine o'clock in the morning at the fishing port of Zarzis with S.M., owner of a coastal fishing boat in Zarzis.

75 أمانة بن كحلة، مرجع سابق، ص 11.

as a means of compensating for the economic losses experienced by coastal fishing seafarers?

III. Invasive species: blue crab and its repercussions on the fishing community in Zarzis

Framer 1: Invasive marine species

The decline and reduction of catch of native species in artisanal coastal fishing activity was initially hindered by certain invasive marine species, such as blue crabs. These species had a negative impact on fishing, acting as a barrier to the industry. However, one of the significant consequences of global warming on Tunisia's marine resources is the extensive proliferation of exotic marine species. The warming of seawater has facilitated the introduction and spread of these species in Tunisia. As per the updated inventory in 2019, Tunisia currently has 230 non-native species, accounting for a quarter of the total number of marine biological invasions in the Mediterranean. In the past century, Tunisia had 34 exotic species, primarily concentrated in the Gulf of Gabes (22 species) with fewer occurrences in the northern (9 species) and eastern sectors (3 species) of the country. In 1990, a total of 61 species were recorded, serving as a reference point for the observed changes. Since then, this figure has doubled after the acceleration of the pace of introduction and especially the successful formulations of these species, most of which became invasive and affected marine ecosystems, fisheries resources and fishing activity in Tunisia. According to some experts, half of the Gulf's marine wealth will have an exotic origin by 2050.⁷⁶

The port of Zarzis is currently facing a highly critical situation, exacerbated by the effects of global warming and the increasing presence of invasive species over the last decade. Among these species is the blue crab, notorious for its voracious appetite and destructive impact on the

⁷⁶ Céline Deandreis et al, **Op.cit.** P 85.

ecosystem. Sailors have even given it the nickname “ISIS”⁷⁷ due to the fear it instills in them⁷⁸. As time passes, the situation in the port continues to deteriorate, posing significant challenges and concerns.

Fishermen have faced a problem with crabs since 2014, as they attack fish in nets and cut the nets themselves. This led to changes in fishing practices, such as pulling nets after only half an hour of fishing instead of leaving them overnight. In 2015, a foreign investor suggested targeting the crabs through the traps, which is then collected and brought to a factory for freezing⁷⁹. This product is now marketed on three continents and in 24 countries, with the majority of exports going to Asia⁸⁰. Among the top three Asian countries are Thailand, Korea and the Philippines⁸¹. As a result, crab production in Tunisia has increased, as shown in Table 4.

Table 4: Evolution of exports in terms of quantity and value of blue crabs

Year	2015	2016	2017	2018	2019 (10 months)
Exports in tons	38	141	770	3355	3549
Value of exports in million Dinars	0.2	0.6	5.4	25	35.5

Source : Céline Deandreis et al, *Op.cit.* P 90.

The fishing industry in Zarzis witnessed a surge in blue crab production, with an increase from 6,000 tons in 2020 to 9,000 tons in 2021⁸². However, it remains to be seen whether this growth translates into better economic prospects for the local fishing community in Zarzis.

At the onset, in a situation marked by a scarcity of fishing resources, the

77 They call it ISIS because of its claws that tear fishing nets, and as a marine species that devours many other marine species, and thus contributes to the disruption of the fishing process and profit and has become one of the signs of loss, and this marine species emerged in the Tunisian seas during the formation of the terrorist organization ISIS (Islamic State of Iraq and the Levant) after 2011. Sailors thus consider ISIS and the Blue Crab to be signs of terrorism, one terrorism on the ground as a killer of human life and the other as a navy terrorism as a killer of marine species and a tearing of fishing nets.

78 Zoé Debussy, Raphael Cuneo, « Ici, tout est mort » : en Tunisie, les pêcheurs contraints à l’exil, Reporterre : Le média de l’écologie, Le 31 Mars 2023 à 9h34.

79 Hervé Bru, Marouane Chikhaoui, *Op.cit.* P 11.

80 Céline Deandreis et autres, *Op.cit.* P 90.

81 Hervé Bru, Marouane Chikhaoui, *Op.cit.* P 11.

82 Regional Delegation for Agricultural Development in Medenine.

pursuit of blue crab fishing emerged as an obligatory endeavor for coastal fishermen. M.A. elucidates this notion by stating that ISIS, an intruder to the Mediterranean Sea, was originally situated in South Asia. However, compelled by the effects of climate change, this species was compelled to migrate to the Arabian Sea, subsequently traversing the Red Sea, the Sinai Peninsula, and eventually settling in the Mediterranean. Presently, the Mediterranean Sea is teeming with this species, known for its prolific reproduction. In light of the dearth of fishing opportunities, numerous fishermen have found solace and sustenance in catching ISIS, making it their refuge and means of livelihood⁸³.

To attain a stable economic and living condition, Zarzis sailors have resorted to catching blue crabs due to the scarcity of other fish species. However, despite their efforts, they face the same issue as other Tunisian coasters - the diminishing prices of blue crabs. Some sailors even claim that the profits from catching blue crabs are not significant, with a kilogram only priced at two dinars, which is fifteen times lower than sea bass and dorad⁸⁴. On the other hand, the suffering does not stop at setting prices, but coastal fishing sailors also suffer from the oppression of commercial institutions and factories, and M.A. says in this context: "Blue crab is sold in Saudi Arabia for about 17 to 22 Tunisian dinars per kg, and Tunisian factories here buy it for 2700 millimes per kilogram. When seafarers, for example, sell one ton of this crab to a commercial factory, the latter will initially reduce 10% of the price of the seas, the factories buy a realistic ton, but paper and financial, they only buy 900 thousand kilograms, considering that 10% is known as the makas⁸⁵ (which is the tax that the publican takes), and similar to this, the factory does not accept the purchase of small sizes of this crab and therefore either returns it to the sailor or refutes it from the balance and does not return it For the seafarer too, commercial factories weigh quantities, buy what comes to his mind, and record on the commercial invoice what they like for him... Consequently, coastal fishing sailors find themselves questioning, "Should we continue fishing for these commercial factories?"

Furthermore, aside from the exploitation of commercial factories, there are additional fees imposed on many seafarers who lack ownership of the fishing gear⁸⁶ and must resort to purchasing from middlemen

83 Interview, with M, A., already mentioned.

84 Zoé Debussy, Raphael Cuneo, **Op.cit.**

85 Makas is a person who is based at the door of the market or circumambulates the merchants and sailors present in the market and obliges them to pay a certain amount of money in exchange for displaying their goods in this market, knowing that this market has been purchased by the municipality or the state.

86 A means of fishing made with iron and line, see picture 1, P 40.

vendors situated between the seas and factories⁸⁷. A.B. elaborates on this concept by citing an example from January 2023, where he purchased 100 traps for a total of 5000 dinars, equating to 50 dinars per trap. He then rents these traps to sailors who are unable or unwilling to purchase their own, and profits by taking 500 millimes per kilogram of their catch and sales. Consequently, if a sailor sells their catch to a factory for 2 dinars and 700 millimeters, they will only receive 2 dinars and 200 millimes after deducting A.B.'s fee⁸⁸.

S.M., the owner of a coastal fishing boat, refrained from catching blue crabs due to the exorbitant costs involved. The price of a single trap alone amounts to 50 dinars, and with a requirement of 400 traps, the expenses become overwhelming. Additionally, the cost of lines adds up to 1000 dinars, making it financially unfeasible for S.M. to engage in blue crab fishing. Consequently, the high expenses have deterred many coastal fishing sailors from pursuing this particular endeavor⁸⁹.

Despite its abundance, the blue crab failed to fulfill the economic and social requirements of coastal fishermen due to its high costs and low selling prices, resulting in an unequal distribution of profits. However, for women employed in agriculture or trap-making workshops, the crab served as a means of livelihood.

IV. Trap making workshops and the suffering of women

In 2020, the Department of Fisheries in Zarzis, under the guidance of Nemo Kantara⁹⁰, extended support to individuals seeking assistance in the agricultural sector. As part of this initiative, M. C.'s family proposed a project focused on packaging and manufacturing traps. The estimated cost of the project was around 16-17 million dinars. If the project cost falls below 26 million dinars and is approved, the project owner would only be required to pay 10% of the total expenses⁹¹.

87 What is conveyed Kouchar in the Tunisian dialect.

88 Interview was conducted on May 8, 2023 at two o'clock in the fishing port of Zarzis with A, B, the owner of a coastal fishing boat and an intermediary between factories and sailors.

89 Interview, with S, M already mentioned.

90 It is an organization whose funding comes from the Italian Cooperation, and has issued an initiative to support the sustainable development of coastal communities in Medenine and Gabes, and to establish a planning system for the participatory and integrated development of coastal zones that will serve as a framework for future initiatives and actions in five wilayas (Bizerte, Gabes, Medenine, Nabeul and Sfax). See the website: <http://tinyurl.com/3byws4mf>

91 Interview, conducted on May 11, 2023 at 11 am in Boughrara with M, Ch., owner of a workshop for the manufacture and packaging of drains in Boughrara.

M. Sh. is a young woman hailing from the Boughrara region in Medenine Governorate. She is the proud owner of a workshop dedicated to the production and packaging of the traps, a fishing tool used for catching blue crabs. Her work commences promptly between five and six in the morning, and it follows no fixed schedule. Occasionally, she takes a break around four o'clock in the evening, only to resume her work from the comfort of her home until ten o'clock at night⁹².

Photo 1: A workshop for making and packaging the drain in Boughrara



• Source: Fieldwork

In “Lemiaa workshop”, approximately 14 women diligently engage in the production, packaging, and mending of traps. Despite the project owner’s repetitive expression of gratitude towards God and her father’s affirmation of its profitability, the figures and statistics fail to substantiate these claims.

Sailors from both Zarzis and Gabes frequently purchase traps from the “Lemiaa workshop”. M.C. emphasizes that the daily quantity of traps can sometimes reach between 50 and 70 traps, depending on the request. Each trap is sold for 42 dinars, with a profit margin not exceeding 7 dinars. The workshop owner is responsible for acquiring the necessary equipment such as iron, net, thread, and packaging. However, if the sailor sponsors the equipment acquisition, the women in the workshop assemble it for the same price of 7 dinars. Additionally, the cost of repairing or patching the trap amounts to 6 dinars.

92 Interview with M. CH, already mentioned.

Toil and hardship from dawn to night, but what is the result?

The data and statistics provided above clearly illustrate a significant disparity between fees and financial difficulties, as well as between agricultural yields and profits. FM.C., who starts their day at dawn and only rests at night, resides in an area with limited access to public services and minimal cultural and recreational amenities. Despite their hard work, FM.C. earns a monthly income ranging from 600 to 700 dinars⁹³.

Comparatively, women endure even greater challenges in terms of labor and income. Furthermore, M.S. emphasizes the lack of support and intervention from the government in developing such projects⁹⁴. Consequently, it can be concluded that women are the most vulnerable and affected by climate change in our Mediterranean and Southern region.

Conclusion

The Mediterranean region is currently witnessing climate changes caused by both natural factors and human activities, particularly the release of greenhouse gases like carbon dioxide and bladder. Tunisia, in particular, is facing the consequences of these changes, including intense and frequent heat waves⁹⁵, decreased rainfall, ocean acidification, increased storm activity, and rising sea levels. These phenomena have detrimental impacts on various sectors such as agriculture, farming, and fishing, posing significant challenges for farmers and fishermen in the country.

The effects of climate change on the coastal and artisanal fishing community of Zarzis and Boughrara are apparent through research and field treatment. The reduction in marine and fish crops, including sponges and octopus, is a result of the fishermen's inability to sail regularly due to the frequent occurrence of sea storms and fluctuations in the intensity of high winds. These changes coincide with an increase in the prices of fishing equipment, resources, and supplies, as well

93 Interview with M. CH, already mentioned.

94 Interview with M. CH, already mentioned.

95 In Tunisia, July 2023 has been recorded as the hottest month ever since 1950, based on data provided by the National Institute of Meteorology. The average temperature, measured across 27 main stations, surpassed the reference rate (1991-2020) by a significant margin of +4 degrees. Similarly, at a global scale, July 2023 has been identified as the hottest month on record since 1950, as per data collected by the European agency COPERNICUS.



as the invasion of some marine species to the Mediterranean region, leading to a decline in the economic and social conditions of the fishing community.

In light of the current climate and global challenges, it has become evident that the agricultural and fishing sector is no longer able to meet the economic and social needs in Tunisia and other countries in the South, particularly among small-scale fishermen, farmers, and agriculturists. As a result, the political voices of northern countries have emphasized the importance of finding environmentally friendly solutions to mitigate the effects of climate change. However, despite the eloquent rhetoric, the reality is quite different. None of the countries are currently making significant progress in reducing their reliance on fossil fuels in the short or medium term. Governments, reluctant to transition away from the fossil fuel-based economic system, have instead opted for measures such as the carbon market. This market allows financiers to freely engage in carbon exchange transactions, but it is merely an application of classical liberalism to the climate issue, where the belief is that the markets will naturally find a solution, "even with a little assistance"⁹⁶.

In light of the information provided, it can be stated concisely and comprehensively that global capitalism, the reliance on burning fossil fuels, and the implementation of neoliberal economic strategies have proven to be advantageous for capital and major investors. This occurs within a larger context where countries in the southern region, such as Tunisia, have struggled to develop alternative solutions to combat the climate crisis. Additionally, successive governments, numerous local political parties, and elites have failed to prioritize climate change in their agendas and electoral programs. These factors pose a threat to the livelihoods of fishermen and contribute to the generation of detrimental and catastrophic consequences, with fragility being the most significant among them. These consequences encompass economic, social, health, and overall living conditions.

96 André Desrochers, **Op.cit.** P 169, 171.



Chapter II

Environmental Dimensions and Deteriorating Economic and Social Conditions in the Coastal and Artisanal Fishing Society

Introduction

From the onset of the industrial revolution in 1750, the focus on environmental concerns by politicians has been minimal. However, with the decline of the Soviet camp and the rise of contemporary neoliberalism, the issue of environmental catastrophe has gained significant attention from states, governments, and various organizations, both governmental and non-governmental. Consequently, transnational protest movements have emerged to combat environmental injustice. It is crucial to understand that the topic of ecology should not be limited to a technical or environmental standpoint alone. According to French sociologist Alain Tauran, the new form of class consciousness lies in the sense of exploitation, which can be observed through the lens of the environmental catastrophe narrative. The climate crisis, which poses a grave threat to us, must be examined not only from an environmental perspective but also from social and economic angles⁹⁷. This chapter will therefore explore the impact of environmental injustice on the socio-economic conditions of fishing communities.

The beaches of Zarzis and Boughrara are not only affected by household and plastic waste, but also by a severe waste crisis caused by the Tunisian Chemical Complex, the National Sanitation Office, and the Tunisian General Shipping Company in Zarzis. Additionally, the coastal and artisanal fishing community is facing the detrimental consequences of unregulated fishing practices, which disregard the well-being of marine life and contribute to the degradation of the seabed and ecosystems. As a result, this ecological imbalance will further widen the divide between two contrasting groups: the impoverished coastal and artisanal fishermen and the destructive practices of industrial fishing such as bag-fishing, trawling, and the use of lights.

Within this particular framework, this section of the research delves into

⁹⁷ Alain Touraine, **La société de communication et des acteurs**, Editions du Seuil, Paris, 2021. P 65, 66.



the correlation between ecosystem degradation and the depletion of marine resources, consequently leading to the vulnerability of fishermen and the perpetuation of poverty. Consequently, what detrimental and calamitous consequences does the fishing community face due to the environmental crisis caused by domestic corporations?

How can we elucidate the fragility and hardships endured by fishermen as a result of poaching, unregulated fishing, and illegal practices? Furthermore, what personal and poignant narratives do rural women endure due to environmental inequity and patronage-based actions?

I. When the sea becomes a national garbage dump

Zarzis is facing a concerning issue as plastic waste continues to inundate its shores, posing a threat to the livelihoods of fishermen. Due to the lack of an effective waste collection system and insufficient awareness regarding the detrimental effects of plastic pollution on water bodies, garbage accumulates in the city's canals before eventually finding its way into the sea. This has prompted seafarers to call for a prohibition on the use of plastic bags⁹⁸. Furthermore, alongside the challenge of household waste, Zarzis also grapples with the problem of industrial waste.

1-Cotusal: A Tale of Colonialism and the Exploitation of Marine Resources

The coastal region of Zarzis is often referred to by sailors as the “salt swamp” or salt marsh. This area is under the ownership of the Tunisian General Shipping Company (COTUSAL), a remnant of colonialism that continues to exploit Tunisia's saline resources. These exploitative practices have persisted since the country gained independence, as the useful concessions granted to COTUSAL have not been reevaluated or renegotiated⁹⁹.

The death of numerous olive trees along the sabkha banks and the decline in soil fertility can be attributed to salt exploitation, the expansion of seawater catchment ponds, and the lack of official control. Similarly, fishermen are facing challenges due to poorly planned pond filling operations, resulting in the depletion of fish stocks and dredging of fish. The situation is aggravated by the expansion of the channel connecting

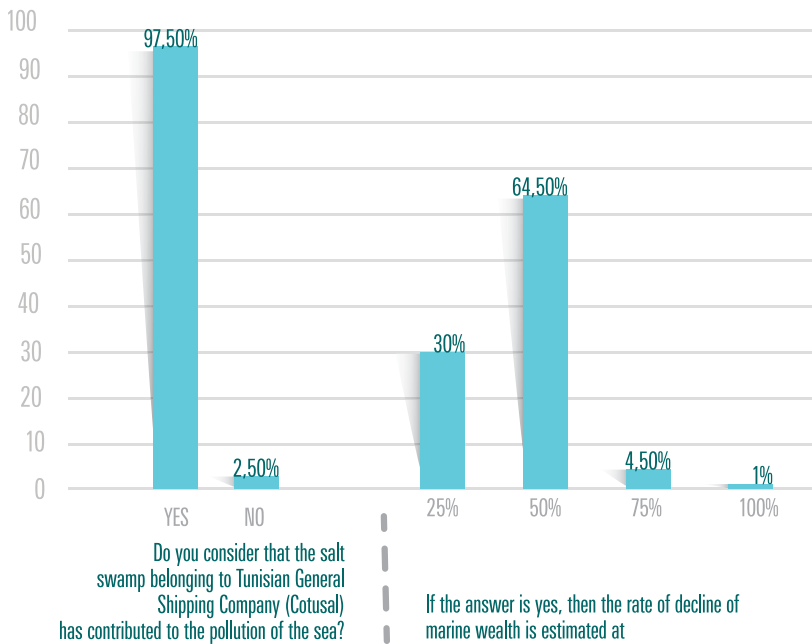
98 Sophie- Anne Bisiaux, Marco Jonville, **Op.cit.**

99 Ibid.

the drying sabkha to the beach by the COTUSAL company¹⁰⁰. M.A. highlights that navigation has also played a role in polluting lakes and small pastures¹⁰¹. Echoing this sentiment, CH.B. affirms that El COTUSAL, an industrial enterprise operating in Zarzis for nearly two decades, has contributed to the pollution of the Mediterranean Sea¹⁰².

The Tunisian General Company of Navigation was established on October 3, 1949. In 1993, the navigation of Zarzis, which is part of the same company, was also established. Given the relatively advanced age of coastal fishing sailors in Zarzis, it is worth exploring whether this company has had any impact on the decline of marine and fish resources. Through their extensive experience and the stories passed down from their ancestors, these seafarers can shed light on whether there has been a decrease in fish resources since the establishment of the navigation company.

Figure 11: Contribution of COTUSAL to sea pollution and decline of marine crops according to the sample questioned



• Source: Fieldwork

100 محمد سميح الباجي، ملح جرجيس: الذهب الأبيض المسلوب، موقع نواة، 05 فيفري 2015. <http://tinyurl.com/ycxsm964>

101 Interview with M, A, already mentioned.

102 Interview with CH. B, already mentioned.

Most seafarers acknowledge that Alcotzal is one of the institutions that contributed to the pollution of the sea and the decline of marine crops, as this company works to destroy the ecological landscape not only through waste, but also by withdrawing small fish during the extraction and exploitation of salt, explains H.M.: "Alkotzale uses intake channels to extract salt, but during the withdrawal process it obtains its salt and large quantities of small fish."¹⁰³

In addition to being a source of pollution, COTUSAL is also known for its tax evasion practices. A document from the Minister of Finance, sent to the Director General of the Agency for the Protection and Development of the Coastal Strip in May 2013, reveals that COTUSAL Company has been avoiding the payment of royalties. Over the period of 2007 to 2012, the company managed to evade taxes amounting to 5.7 million dinars, which should have been paid to the Tunisian state¹⁰⁴.

Despite being associated with the remnants of colonialism, environmental pollution, and tax evasion, shipping companies have continued to operate without much interference from successive governments since 2011. In an attempt to take action against one such company, Industry Minister Zakaria Mohamed announced his intention to stop dealing with COTUSAL, a French company that exploits Tunisian salt, but his position quickly changed to one of review or amendment rather than cancellation¹⁰⁵. Unfortunately, shipping companies have yet to play a positive role in their local social and economic responsibilities.

2. The Conflict of Capital against the Impoverished: The Chemical Complex

During the French colonial period in Tunisia, mining companies were established. However, the chemical complex in Ghannouch near the Gulf of Gabes was established in the early 1970s. This occurred during a time when the Tunisian state embraced an economic model that prioritized state involvement over market principles. As a result, the state became

103 Interview conducted on May 10, 2023 at 11:32 at the School of Fisheries in Zarzis, with H, M, instructor in fishing equipment and techniques since 1976 at the School of Fishing in Zarzis.

104 محمد سميج الباجي، الشركة العامة للملاحة التونسية (كوتيزال): 5.7 مليون دينار قيمة التهريب الضريبي تكافئ بامتياز استغلال جديد»، موقع نواة، 14 ماي 2014.

<http://tinyurl.com/yfmumtmz>

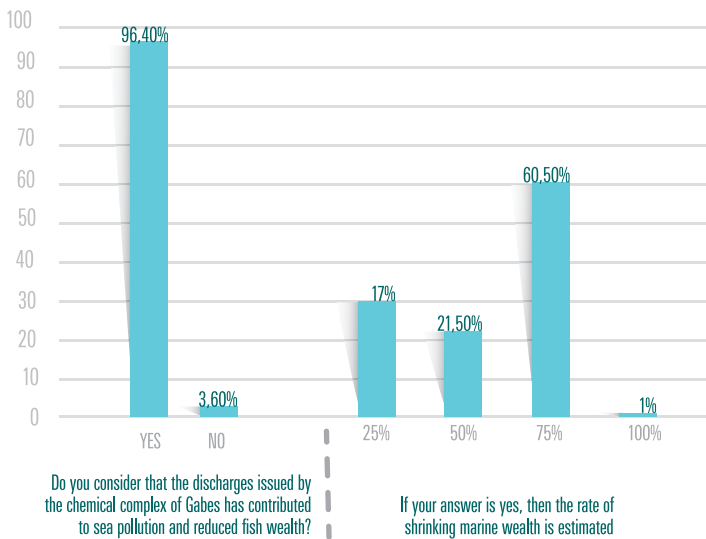
105 ملف: كوتوزال واستغلال الملح التونسي، القصة كاملة

<http://tinyurl.com/2zrb75xs>

an economic partner¹⁰⁶. The main purpose of this company is to convert phosphate into phosphoric acid and subsequently into fertilizer¹⁰⁷. Additionally, the chemical complex's activities result in the discharge of phosphogypsum.

A group of research professors from the National School of Engineers of Sfax conducted a study on the environmental impact of phosphogypsum storage in Sfax. Their findings revealed that phosphogypsum, due to its composition containing toxic substances and radioactive emitters, is a source of pollution¹⁰⁸. The European Commission's 2018¹⁰⁹ study on the oceans also showed that the chemical complex's activity results in the discharge of 5 million tons of phosphogypsum in the form of gypsum mud, a toxic waste loaded with heavy metals, into the Mediterranean at a rate of 40,000 cubic meters per day. The sailors from Zarzis agree that the chemical complex is one of the major contributors to sea pollution and the destruction of fish.

Chart 12: Contribution of the chemical complex to sea pollution and decline of marine crops according to the research sample



Source: Fieldwork

106 المولدي قسومي، المنظمة النقابية لأرباب العمل التونسيين: الأطوار والأدوار، تقديم: الهادي التيمومي، دار نفوس عربية، تونس، 2018، ص 125.

107 Zoé Debussy, Raphael Cuneo, **Op.cit.**

108 ياسين النابلي، مصنع السياب بصفاقس: التلوث ولعبة المصالح، موقع نواة، 23 فيفري 2016، <http://tinyurl.com/mparxd7x>

109 Commission Européenne, Etude d'impact de la pollution industrielle sur l'économie de la région de Gabés, 30 Mars 2018.

The pollution originating from the discharge of toxic waste into the sea not only contributes to the contamination of the sea in Gabes, but also extends to the outskirts of Zarzis, the beaches of Boughrara, and the island of Djerba. According to M.A., the shrinking pastures (natural ponds) serve as an indicator of environmental pollution, as the pollution from the Gulf of Gabes reaches Zarzis, Djerba, and Boughrara¹¹⁰.

The connection between the decline of certain fish species and the abundance of sponges is a concern among seafarers, who attribute it to unfair environmental practices. S.K. confirms this, stating that the chemical complex in Sfax (Al-Sayyab factory) and Fossougebs Gabes have caused damage to the sponge population. Previously, these sponges were found in abundance in the Gulf of Gabes and Skhira. However, there has been a noticeable decline in this marine species, as sponges thrive in clean ocean environments¹¹¹.

Furthermore, the chemical complex in Gabes has had a detrimental impact on marine wealth, becoming a symbol of injustice and dominance for coastal fishing sailors in Zarzis. CH.B. testifies to this, highlighting the harmful effects of pollution on the fishing industry. The presence of phosphogypsum has had a negative impact on the entire Gulf of Gabes. As a result, deformities in fish have been observed, and the once common sight of whales swimming in the sea has become rare¹¹².

The chemical complex has caused harm not only to the sailors of Gabes, but also to the sailors of Zarzis. However, while some fishermen in Gabes receive compensation for pollution and are able to fish along the coast of Zarzis, the sailors of Zarzis receive no compensation despite being affected¹¹³. As a result, this institution does not fulfill its local social and economic responsibilities. Instead, it stands as a symbol of pollution, environmental degradation, and social decline. It represents a capitalist institution that has waged war on the poor by destroying the palm oases of Gabes, polluting the air, causing the death of numerous animals and plants, and contaminating the sea, which is the livelihood source for fishermen. Some even refer to it as environmental terrorism, within the context of a political discourse focused on combating terrorism. This is just one example that highlights the negative consequences associated with the extractive

110 Interview with M, A, already mentioned.

111 Interview with S. K, already mentioned.

112 Interview with CH. B, already mentioned.

113 Sophie- Anne Bisiaux, Marco Jonville, **Op.cit.**

approach and its detrimental effects¹¹⁴.

II. Fishing terrorism and destruction of marine wealth

Illegal fishing practices in the Zarzis region are causing destruction of marine life and spawning sites. Some boats that specialize in deep sea fishing are illegally entering shallow waters and using trawls to catch benthic fish, which is leading to overfishing and destruction of marine wealth¹¹⁵. Legal fishermen who follow the rules and fish at depths of 40-50 meters are also affected by this illegal activity. Bag fishing, which is prohibited, is being carried out by fishermen who use boats without proper identification and powerful engines to fish at small depths. This illegal activity is causing discontent and resentment among the sailors of Zarzis¹¹⁶.

In contrast, fishermen utilize 320-volt searchlights instead of 220 volts when fishing at depths below 35 meters to attract and capture blue fish. However, this practice has detrimental effects on fish populations and marine ecosystems¹¹⁷. M.A. explains that the monitoring of fishing activities reveals both legal and illegal forms of fishing with lights. In the case of illegal fishing, powerful searchlights exceeding 220 volts and reaching up to 380 volts are deployed above the sea. Fishermen in places like the port of Zarzis, known for catching and selling blue fish, keep the searchlights on for extended periods of 5 to 6 hours during the night. When they observe a significant gathering of fish beneath the lights, they capture them using nets. This fishing method not only leads to the depletion of marine and fish species but also causes harm to sea grass. Furthermore, the fishermen often disregard the appropriate depths for using the searchlights, sometimes activating them at a depth of only 15 meters, whereas they should only be used at depths exceeding 25 meters¹¹⁸.

The depletion of fish stocks does not stop there, but "some fishermen leave their nets lying in the water for two days and even more in order to enhance their chances of catching some species of fish of high commercial value, although the law prohibits such practices."¹¹⁹

114 حمزة حموشين، أي تنمية نريد؟ العدالة البيئية والاستخراجية والتنمية المستدامة، في نحو تنمية عادلة اجتماعيًا في منطقة الشرق الأوسط وشمال إفريقيا، تحرير وتقديم: سلام سعيد، ترجمة: ياسر الزيات، مؤسسة فريديش إيبيرت، 2017، ص 102-117، ص 104.

115 أمانة بن كحلة، مرجع سابق، ص 12.

116 Interview with M, A, already mentioned.

117 أمانة بن كحلة، مرجع سابق، ص 12.

118 Interview with M, A, already mentioned.

119 أمانة بن كحلة، مرجع سابق، ص 12.

In 2021, the quantities of marine production in the fishing port of Zarzis reached 6339 tons, of which 53 tons of bathymetric fishing production, 210 tons of tuna fishing, 146 tons of lake fishing and fish farming, 0.3 tons of sponge fishing, 2816 tons of coastal fishing production and 3312 tons of light fishing production¹²⁰. Thus, spotlight fishing produces an imbalance between it and other types of fisheries, as through powerful searchlights, this type of fishing monopolizes marine and fish wealth at the expense of the “fishing poor”.

The state’s incapacity and ineffectiveness are evident in the presence of these unselective practices. Despite numerous governments since 2011, none have successfully implemented transformative measures to address the crisis endangering marine ecosystems. Even the current government, which came into power after July 25, 2021, has failed to resolve these pressing issues that jeopardize the safety and preservation of marine resources. The utilization of such fishing techniques not only leads to the destruction of marine ecosystems and fish populations but also poses a significant threat to the survival of numerous species, pushing them towards extinction.

The practice of this fishing method is not exclusive to Tunisian boats and ships. The sailors of Zarzis also keep a watchful eye on foreign vessels that sail in the fishing area. CH.B. describes this as “fishing terrorism,” citing examples of Egyptian ships that violate fisheries during biological rest periods that last for four to five days. Additionally, around 3,000 boats and fishing vessels operate illegally and do not adhere to biological comfort regulations¹²¹.

Despite the detrimental impact caused by these vessels on marine resources, it is the fishermen who bear the brunt of the consequences while the senior seafarers are the sole beneficiaries of the Biological Comfort Fund. The fishermen contribute 2% of their fish harvest sales to the UTP, yet they do not receive any compensation during the biological rest period. This fund only benefits the senior seafarers, leaving the fishing poor without any support¹²².

The continuous overfishing and destructive practices such as dredging have led to a decline in fish stocks and significant changes in the marine ecosystem. These unfavorable conditions disregard the concept of biological comfort, rendering many marine species unable to survive

120 الجمهورية التونسية، وزارة الاقتصاد والتخطيط، ديوان تنمية الجنوب، “ولاية مدنين بالأرقام 2021”، أكتوبر 2022، ص 117.

121 Interview with CH, B, already mentioned.

122 Interview with CH, B, already mentioned.

and making them highly susceptible to extinction. The consequences of such actions are devastating, wiping out entire generations of marine life and leaving behind a barren sea¹²³.

The economic and social conditions of coastal fishing seafarers in Zarzis have been negatively impacted by intensive fishing practices. According to 94.50% of respondents, bag fishing and trawling have contributed to the deterioration and fragility of their economic and social conditions. This has resulted in the formation of two opposing classes in the Mediterranean space: the rich, who engage in random fishing practices, and the poor, consisting of traditional fishermen and coastal fishing sailors.

III. Women Victims of Social and Environmental Unjustice: The Story of Struggling and Oppressed Women

Within this study, a portion of the experiences of women employed in the agricultural industry in the Boughrara region are recounted. This section serves as a descriptive and historical retelling, aiming to create a dramatic narrative. Additionally, it seeks to address the question of how environmental, climatic, and social injustices can contribute to the development of resentment among female farmers and fishers.

A.K. has been employed in the agricultural industry of Boughrara since 2007. From October to March annually, she dedicates her time to tying or sewing nets from sunrise to sunset. During the olive harvest season, A.K. participates in the harvesting process. However, instead of receiving monetary compensation, she requests and receives approximately 50 liters of oil. This quantity serves as a crucial household supply for the entire year, meeting their consumption needs¹²⁴.

A.K. has inherited the skill of tying fishing nets from her father, who used to work as a “bahri” (fisherman) before being diagnosed with cancer in 2019. She now works alongside her sister and mother in this profession. However, A.K. and her family face various challenges and hardships in their line of work. According to her, during certain seasons, they are required to tie and sew approximately 100 fishing nets upon the request of the sailors. Sometimes, the sailors provide them with

123 Interview with M, A, already mentioned.

124 A direct interview with A.K., a worker in the agricultural sector in Boughrara, the interview took place on March 10, 2023 at 5 pm at the Mahari hostel in Hammamet, on the occasion of the first national conference of female workers in the agricultural sector and organized by the Tunisian Forum for Economic and Social Rights.



new nets to be tied, while other times they give them old nets that need to be repaired and maintained. Unfortunately, these used nets are often contaminated with marine crabs that get stuck in them, resulting in a foul smell. Moreover, A.K.'s sister has developed a fungal infection in her nails as a consequence of handling these contaminated nets¹²⁵.

Women employed in the fishing gear preparation industry face the challenge of skin pollution caused by their work. However, their struggles extend beyond this issue. A.K., like many other women, also experiences the hardships of the job and its low wages. She explains, "My mother is unwell and can only manage to tie one fishing net per day. On the other hand, my sister and I work tirelessly to tie four nets daily. This work is far from easy, especially when considering that we only earn 50 dinars for our efforts. Moreover, our father is battling cancer, and we bear the burden of his medical expenses. Each net is valued at 10 dinars, yet some fishermen have the audacity to complain about the quality of our work and the way we maintain or tie the fishing nets. They believe that our work does not meet their standards."¹²⁶

Women in Boughrara actively participate in the oyster collection industry, which is spread across three governorates: Sfax, Medenine, and Gabes. The majority of oyster collection factories are situated in Sfax, which encompasses four collection areas. The first area stretches from the northern border to the cliff, followed by the Boughrara region, the Djerba region, and finally the Zarzis region. Oyster collection campaigns take place from autumn to spring, with an average size of 35 mm. Oyster collection serves as an "alternative occupation" to olive or grain production¹²⁷. However, women engaged in this activity face numerous challenges, including unfavorable environmental, commercial, and political conditions. Z.M. explains that from the country's independence in 1956 until 1996, oyster collection was an unrestricted activity. During this time, health tests and obtaining health cards were mandatory, and workers used to wear appropriate footwear. In fact, Z.M. was able to build her house through this activity, collecting up to 20 kilograms of oysters per day. However, since 2011, the quantity has significantly decreased to only five kilograms of oysters ... She added: "In 1997, we began selling a marine product through the black market due to the control of production and distribution by influential families. Prior to this, the complexes would come to Boughrara and pricing was transparent. However, after 1997, the complexes moved to Gabes and Sfax, and we

125 Interview with A, K, already mentioned.

126 Interview with A, K, already mentioned.

127 Hervé Bru, Marouane Chikhaoui, **Op.cit.** P 11.

were unable to deliver the product without a broker. This broker now sets the price and gives us an ultimatum: sell at their price or keep the oysters.”¹²⁸

Z.M.’s testimony exhibits some uncertainty regarding the influential families who held a monopoly over the acquisition and trade of oysters, as the woman being questioned failed to ascertain the social, economic, and political identities of these families. However, what we can concur with is that during the late 1990s and early 2000s, Tunisia’s economic policy was characterized by the influence of favoritism and clientelism. The Tunisian capitalist system has undergone transformations that have caused it to transition from a form of “state capitalism” to “state-sponsored capitalism,” and then from 1986 onwards, it attempted to embrace “capitalism opening up to global competition.” Finally, in the first decade of the twenty-first century, it evolved into a form of “capitalism driven by favoritism and nepotism.”¹²⁹

Z.M. states that women in Boughrara engage in this particular activity along the beaches of Gabes, Ben Guerdane, Zarzis, and Djerba. Their journey is not an easy one, as M.B. describes it as arduous. The women who collect oysters are resilient and determined, walking approximately 4 kilometers on foot in search of oysters. They face numerous challenges, including sea pollution and the need to dive to depths of 3 to 4 meters to gather the oysters. Sometimes, they manage to collect two or three kilograms, only to find that the broker refuses to purchase them¹³⁰

Regarding the weather, the women involved in oyster collection emphasize that the abuse of this activity occurs during cold weather rather than high temperatures. They believe that hot weather is detrimental to oysters, as it can lead to their demise. Analyzing the impact of high temperatures on oysters reveals a potential threat of significant decline in this marine species, which would ultimately harm the workers engaged in this activity.

128 Interview with Z.M., a worker in the oyster gathering activity in Boughrara, was conducted on March 10, 2023 at 4 pm at the Mahari hostel in Hammamet, on the occasion of the First National Conference of Women Workers in the Agricultural Sector and organized by the Tunisian Forum for Economic and Social Rights.

129 بكار غريب، “مسألة منوال التنمية البديل”، في حركة المجتمع التونسي في عشرية الثورة بين “إرادة الحياة” و “استجابة القدر”، تقديم: المولدي قسومي، تونس، دار محمد علي للنشر، 2020، ص 139-146، ص 144.

130 Interview conducted on May 11, 2023 at 11:08 am in the Youth Center Boughrara with M.B., a worker in the agricultural sector in Boughrara.

Z.M. highlights the economic and environmental hardships faced by women in dramatic stories. She shares her personal experience, stating that she has been involved in oyster gathering since the age of 16. Previously, this work provided for their needs, but now the economic conditions are poor, and they also suffer from the uncleanliness of the Boughrara Sea¹³¹. Similarly, Z.M. emphasizes the connection between oyster shrinking and the environment. She explains that the areas where they used to collect oysters have been polluted by the chemical complex in Gabes and the sanitation office in Djerba, leading to adverse effects on the sea¹³².

Despite these challenges, the Regional Commission for Agricultural Development in Medenine and the Department of Fisheries and Fish Farming in Zarzis have closed down oyster collection in the governorate of Medenine since 2017. A.S. sheds light on the issue, mentioning that the pending tests in Medenine have been a major problem. She clarifies that there have been no confirmed cases of people falling ill from oysters, and Tunisia conducts regular tests (around 15 types of analysis every month). However, the governorate of Medenine has been unable to carry out these tests¹³³.

The economic opportunities for women in the oyster collection industry have been severely limited due to the pretext of a lack of analysis. Many women have been forced to sell their oysters in an irregular manner, and despite their efforts, they are constantly being monitored by the Marine Guard. This has resulted in a great deal of sadness and frustration for these women, who often collect large quantities of oysters only to have them destroyed by the authorities.

Despite these challenges, women in the industry are still subject to the laws put in place by those in power. CH.B., an engineer, argues that women who work in oyster collection are sacrificing their own biological comfort, and yet they are still required to pay a 2% deduction on the value of their crops. This highlights the systemic issues faced by women in the industry, who are often forced to work in difficult conditions and face significant barriers to economic success¹³⁴.

131 Live interview conducted on May 11, 2023 at midday at the Youth House of Boughrara with Y, a worker in the oyster collection activity in the Boughrara.

132 Interview with Z. M, already mentioned.

133 Interview with A, S already mentioned.

134 Interview with CH., B, already mentioned.

Women often bear the brunt of unjust policies, being disproportionately affected by climate and environmental shifts, which can further exacerbate existing gender inequalities. On a global scale, women face greater barriers in accessing crucial resources such as financial support, institutional assistance, and other means to enhance their ability to adapt to climate change. This includes limited access to land, credit, agricultural inputs, decision-making positions, technology, and training services¹³⁵.

Conclusion

In light of the presence of extractive and polluting companies like the chemical complex, as well as the existence of companies that stem from colonial remnants such as the COTUSAL, which follow a model of serving countries from the South to the North, and in a situation where national models and policies have prevailed over investors and large-scale fishermen, the Tunisian fishing area, particularly the southern region and the Gulf of Gabes, has transformed into a dumping ground and a breeding ground for owners of large vessels, consequently leaving small-scale fishermen vulnerable.

Despite the fact that the coastal fishing sector is considered a “noble and rational sector” that still adheres to traditional practices, with fishermen relying on hooks and nets, following seasonal patterns, and not contributing to the depletion of fish stocks or polluting the sea, it is unfortunate that these two groups, along with women engaged in oyster fishing using traditional methods that do not harm the environment, are the ones most adversely affected by climate change and environmental injustice.

The economic, social, and health situation of coastal fishing sailors, social operators in Zarzis, and peasant women in Boughrara has been greatly affected by the uncontrolled environmental model, the worsening problem of indiscriminate fishing, and the lack of action from the authorities. These factors have played a significant role in the deterioration of their circumstances. Furthermore, the negative and unequal consequences of Tunisian-European partnerships are evident in a global context, where the primary culprits are the neo-colonial international relations that exploit numerous countries through

135 التقرير الخامس، التنمية المستدامة والعمل اللائق والوظائف الخضراء، مكتب العمل الدولي، جنيف، 2013، ص 13.

multinational corporations, trade regulations, agreements, and influential institutions like the World Bank and the International Monetary Fund¹³⁶.

Since the 1970s, Tunisia has embraced the economic models of global capitalism amidst the backdrop of ongoing global transformations. However, this adoption has come at a cost. The extractive model employed in Tunisia, such as the phosphate industry in the mining basin and its subsequent treatment in the chemical complex in Gabes, has resulted in detrimental effects on the environment, particularly sea pollution. In the pursuit of added value, the state has prioritized economic gains over social justice, equality, local health, and the livelihoods of farmers and fishermen. This has led to a significant environmental injustice, which is a prominent characteristic of the contemporary neoliberal system. This system is marked by three key aspects: firstly, the widening gap between and within nations; secondly, the exploitation of transnational corporations under the guise of a free market ideology, where certain societies and classes benefit more than others due to selective application of loopholes and laws; and thirdly, the burden of unsustainable environmental degradation that disproportionately impacts the health and livelihoods of the impoverished¹³⁷. Thus, on a temporal scale, the effects of ecosystem waste and the climate crisis are the indirect costs of imperialism, colonial powers, and the neoliberal policies adopted by most of the South in terms of dependency and disengagement.

136 حمزة حموشين، مرجع سابق، ص 104.

137 Rob Nixon, **Slow violence and the environmentalism of the poor**, Harvard University Press, 2011. P 45.



Chapter III:

The Powerless State and the Fragility of the Coastal and Artisanal Fishing Society

Introduction

The economic and social conditions of small seafarers have been negatively impacted by the changing climate. Additionally, the coastal and artisanal fishing community has suffered from environmental injustice and the depletion of fish wealth due to unsustainable fishing practices such as bag, trawl, and spotlight fishing. These factors have further worsened the socio-economic situation of these communities.

In addition, seafarers face the unjust division of borders and are subjected to extortion and threats from fellow seafarers who have turned to piracy. Despite enduring such hardships, coastal fishing seafarers fulfill their humanitarian duty by rescuing irregular migrants who are stranded at sea. However, both Tunisian authorities and European migration policies criminalize these search and rescue operations. As a result, coastal and artisanal fishing sailors find themselves trapped in a cycle of deprivation. The Tunisian revolution in 2011 was marked by calls for freedom and social justice, while the events of July 25, 2021 emphasized the progress of marginalized and disadvantaged groups. Amidst these political and rapid transformations, seafarers continue to struggle, organizing protest movements with various objectives. The question remains: what has truly changed?

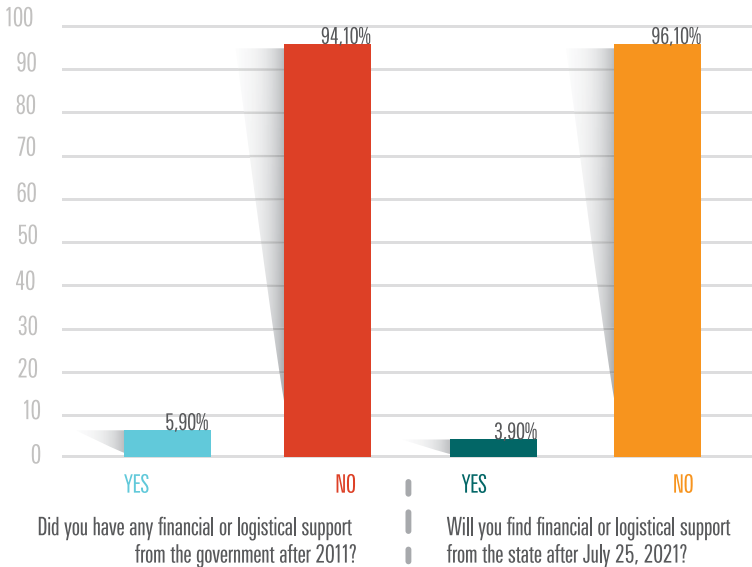
This chapter delves into the analysis of the Tunisian state's involvement and reaction towards the social and economic needs of the coastal and artisanal fishing community during transitional periods, specifically after 2011 and after July 25, 2021. It also explores the state's endeavors to combat extortion activities within Tunisian maritime boundaries and seek resolutions for equitable border divisions. Furthermore, this chapter highlights the state's role in overseeing, directing, and guiding fishermen, while also examining the impact of European and national migration policies that have transformed humanitarian efforts into criminal operations.



I. The absence of material and logistical pillars after the Tunisian revolution

Coastal fishing sailors in Zarzis, amidst the challenges posed by climate change, environmental pollution in the Mediterranean Sea, and the worsening socio-economic conditions of fishermen, are they provided with material and logistical assistance by the state? This support is sought to be determined for the periods after 2011 and after July 25, 2021.

Chart 13: Material and logistical pillars after 2011 and after July 25, 2021 according to the sample questioned



• Source: Fieldwork

There is quantitative evidence indicating that the Tunisian state has not been actively involved in assisting and supporting coastal fishing seafarers. Despite the promising political speeches made in 2011 and after July 25, 2021, highlighting the importance of supporting vulnerable groups and the state's intervention in the economic and social sectors, these words have not been followed by concrete actions to address the growing dissatisfaction and resentment among the affected individuals.

II. Fishermen stuck in the “sea desert”

The absence of the state is embodied not only in the socio-economic issue, but also in its relationship to transnational issues, through the unfair division of borders and the leaving of fishermen alone in the face of gunshots and extortion by some pirates.

Fishermen are adamant that the fishing zone of Zarzis has transformed into a real desert. Following the partition and global involvement in the Mediterranean, Zarzis fishermen have been confined to coastal waters that have been depleted of fish due to environmental catastrophes and excessive fishing¹³⁸. M.A said: “In the past, prior

to 2005, we operated within a maritime zone shared by Tunisia and Libya, where Tunisians, Libyans, and even Maltese fishermen could be found. The Tunisian government had signed international agreements regarding this matter, while Libya, during Muammar Gaddafi’s reign, claimed ownership of 74 miles along its shores and borders, and Algeria obtained 74 miles. In contrast, Tunisia was only granted 24 miles. This division of borders is unjust and inequitable, and it is the coastal fishing communities who bear the consequences. If they do not venture into these areas, their gains will be minimal or nonexistent.”¹³⁹

Since 2005, various countries participating in the 5 Zayed 5 dialogue have expanded their maritime boundaries, establishing exclusive fishing zones and denying access to Tunisian seafarers. Tunisia, on the other hand, has established its own fishing space and allows foreign ships to enter, unlike Libya. Egyptian fishing vessels, along with Tunisian fishing vessels from Sfax, are particularly active in these waters, as they are no longer able to fish in Libya’s abundant fishing grounds. Additionally, the southern waters of Tunisia have suffered an environmental catastrophe, resulting in a depletion of fish due to excessive fishing.¹⁴⁰

Prior to the Tunisian revolution, seafarers were already facing challenges in finding fish-rich areas, but the situation worsened after the Libyan crisis in 2011, as seafarers lost the opportunity to sail in Libya’s waters, specifically in the Gulf of Sirte, which was known for its abundant fish population.

1. When hunters turn into pirates

The sailors of Zarzis express their sorrow: “In Tunisia, we have the National Maritime Coast Guard, along with militias. In the absence of a functioning government, we will undoubtedly face hardships.” Another sailor laments the deteriorating situation in Libya since Gaddafi’s demise, stating that many fishermen have resorted to piracy¹⁴¹. Following 2011,

138 Sophie- Anne Bisiaux, Marco Jonville, **Op.cit.**

139 Interview with M, A, already mentioned.

140 Sophie- Anne Bisiaux, Marco Jonville, **Op.cit.**

141 Zoé Debussy, Raphael Cuneo, **Op.cit.**



Zarzis and all Tunisian sailors were prohibited from fishing in Libyan waters, leaving them vulnerable to extortion, threats, and even death in the Mediterranean Sea.

A Tunisian fisherman was fatally shot by a Libyan coastal boat in 2012, while 18 other crew members were taken captive in Tripoli. In 2015, Libyan armed groups detained four Tunisian fishing boats that entered Libyan waters and brought them to the port of Zuwara. These attacks also occurred in Tunisian waters, as evidenced by the February 2016 incident where 13 Tunisian fishing vessels with 70 sailors were boarded and taken to the same port, with the Libyan side demanding a ransom for their release. In 2017, Libyan fishermen from Zuwara threatened to abduct any

Tunisian sailor they encountered at sea in retaliation for the Tunisian naval guard's seizure of a Libyan fishing vessel in the port of Sfax. Since then, hostage-taking has become more frequent¹⁴². As a result, 90.10% of the study participants acknowledge that they are unable to fish in Libyan waters, and 90.10% also confirm that they have been extorted and threatened by Libyan pirates. Seafarers are in danger, and fishermen and the Association of the Seas Environmental Development in Zarzis are criticizing the Tunisian authorities for their lack of a strong response¹⁴³.

Climate change and environmental injustice have caused immense suffering for fishermen, but seafarers in Zarzis face an additional challenge of being trapped in a marine desert. The threat of extinction looms over many fish species, and some Libyan militias have resorted to gunfire in the surrounding waters. "With the Tunisian state almost absent and Libyan authority completely absent, seafarers have had to rely on their relational and historical capital to survive. The logic of brotherhood, rapprochement, and neighbourliness has become their lifeline in the absence of any negotiating authority". However, the legal system in Zarzis further exacerbates the plight of coastal fishing sailors, as it favors the rich and marginalizes the poor¹⁴⁴.

142 Sophie- Anne Bisiaux, Marco Jonville, **Op.cit.**

143 Ibid.

144 Interview with M, A, already mentioned.

III. Law: The domination of the strong over the weak

1. Biological comfort without material compensation and social coverage without social justice

With pain and due to unfair laws, CH.B. says: “Coastal fishing is the weak link, and that is why this sector is witnessing a huge surge in migration.”¹⁴⁵

The “fishing poor” are victims of laws drafted by the Tunisian state, paying royalties to the biological comfort fund but receiving no compensation or benefits¹⁴⁶. On the other hand, most coastal fishing sailors are involved in the social security system individually, considering that the seafarer is required to pay the social security information even if there are no marine crops and economic profits, so one of the most important obstacles that coastal fishing sailors face is the unfair social coverage law, A.S. stresses: “The social security system is an unhappy system in the fishing sector and is not in the service of small seafarers, so it must be addressed.”¹⁴⁷

CH. B states that he is not against the law, but he supports a law that takes into consideration the needs of the less fortunate and safeguards human dignity. As coastal fishing sailors, they are required to pay 8% of their earnings after fishing, which is then distributed as follows: 4% to the fish agent, 2% to support seafarers, and 2% to the biological comfort fund. However, they do not receive any compensation from the Biological Comfort Fund. The issue with coastal fishing lies in the fact that the social coverage law does not align with the sector’s requirements. According to the law, they are obligated to contribute to the social security fund every three months. Unfortunately, some of their colleagues are unable to make these payments, resulting in their boats being seized. This creates a significant problem as their livelihoods are dependent on the sea, and without any marine crops or material profits, their source of income is withheld.¹⁴⁸

Despite the formation of multiple governments since 2011, the situation for coastal fishing sailors has remained unchanged. In 2016, the Ministry of Agriculture declared its intention to address poaching and ensure social coverage for all fishermen by 2017. However, none of

145 Interview with CH, B, already mentioned.

146 Law n° 2002-32 dated 12 March 2002 relating to the social security system for certain types of workers in the agricultural and non-agricultural sectors.

147 Interview with A, S, already mentioned.

148 Interview with CH, B, already mentioned.



these promises have been fulfilled, and the existing laws continue to perpetuate the structural impoverishment of coastal fishing seafarers.

2. Humanitarian Assistance and the Security Legal Approach

“Rescue is not a matter of legality, but rather a matter of humanity. There is a saying that I always reiterate: only the seas can truly understand and empathize with the suffering of those in distressed or sunken boats. This is a feeling that cannot even be wished upon one’s enemies, and sailors, who are familiar with the plight of a stricken and disabled vessel, as well as the meaning of drowning, do not consider the law, religion, or race when they encounter someone in need of help at sea. When faced with a person fighting for their life, there is nothing more tragic than death, and therefore, sailors will do whatever it takes to save them.”¹⁴⁹

Zarzis sailors frequently encounter irregular migrants stranded in fragile and distressed boats while they are out fishing, particularly after 2011. Tragically, they sometimes come across floating bodies as well. In these distressing situations, coastal fishing sailors step in to assist and bring the stranded individuals to safety. However, these rescue operations come at a cost of lost working hours and money. To enhance their effectiveness in saving as many migrants as possible, over 100 sailors from Zarzis participated in a comprehensive 6-day training course on maritime rescue organized by MSF in 2015. While European policies have criminalized NGOs involved in search and rescue operations in the Mediterranean,

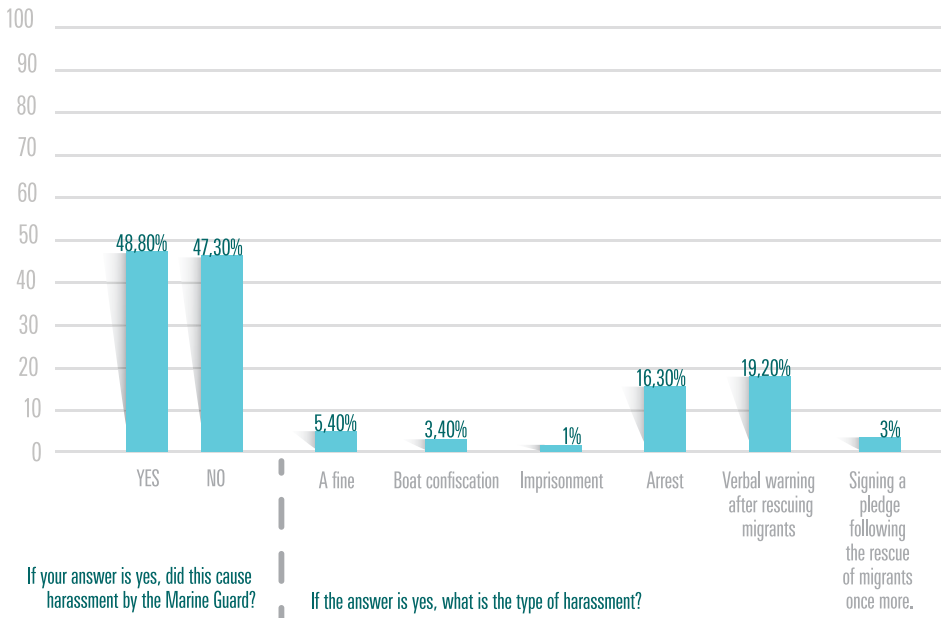
Tunisian fishermen find themselves at the forefront of these life-saving efforts. Even when they set out to sea for fishing, they are equipped with water and food in anticipation of encountering a sinking boat along their path.¹⁵⁰

According to quantitative data, a significant number of coastal fishing sailors in Zarzis uphold the responsibility of humanitarian action by providing aid and support to migrants who are stranded at sea. The data reveals that 93% of respondents confirmed that they have provided assistance to rescue irregular migrants who were stranded at sea. However, despite their efforts, fishermen are subjected to punitive measures due to European and national policies that criminalize humanitarian aid operations.

149 Interview with M, A, already mentioned.

150 Sophie- Anne Bisiaux, Marco Jonville, **Op.cit.**

Graph 14: After the rescue: Evolution, Source and Forms of Harassment by Sample Questioned



• Source: fieldwork

Rescue operations can be deemed illegal by the Tunisian authorities in accordance with Law No. 6 of 2004, enacted on 3 February 2004, which specifically criminalizes such operations. Article 38 of this law clearly stipulates that anyone who guides, plans, facilitates, assists, mediates, or organizes, regardless of whether it is done for free, the entry or departure of an individual into or from Tunisian territory clandestinely, whether by land, sea, air, or through other means, shall be subject to imprisonment for a period of three years and a financial fine of eight thousand dinars.

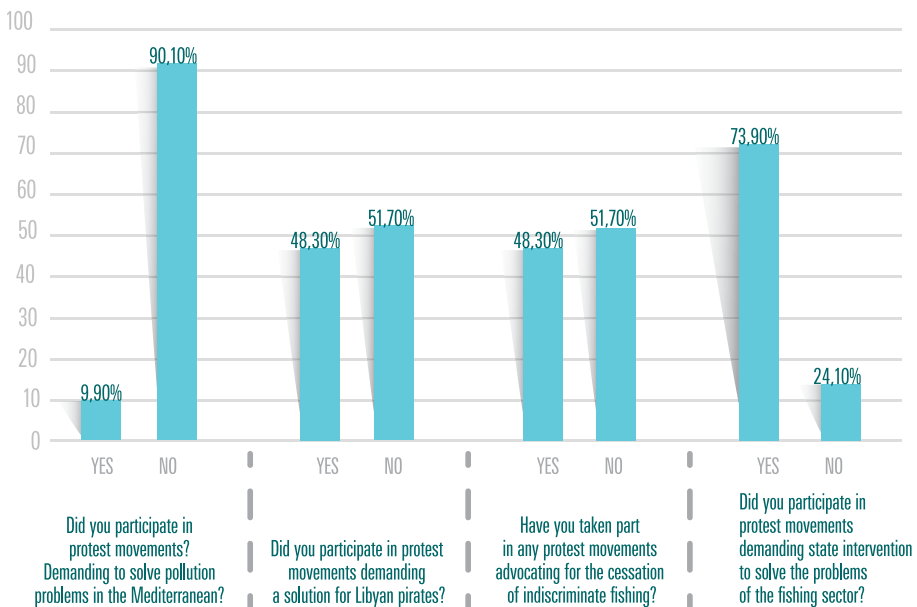
Seafarers suffer from the oppression of economic, social and environmental conditions and climate change and are trapped in the maritime desert and yet provide humanitarian aid, but the law punishes the poor fishing, and thus the state is absent in fair development programs and is prepared during the repressive practice. Through arrests, trials and harassment after rescue operations, fishermen feel the state's presence through persecution practices. The state is essentially a violent institution but invisible to most people in everyday life. We may talk about it in the abstract, but when we face security harassment and hit the state's justice, we recognize it in a different

way by “feeling it in our skin and body.”¹⁵¹

IV. Social inequality and protest movements

“We are still going to fight, we have met with almost all state structures but there is no progress, the state has left us no other room than protest.” With this quote, CH.B.¹⁵² explained the reason for the protest of coastal fishing sailors in Zarzis, as the absence and inability of the state contributed to the formation of many protest movements and various stakes, whether environmental, social and economic, or demanding the creation of a bulk of insecurity at sea.

Chart 15: Evolution of protest movements according to the sample questioned



• Source: Fieldwork

The protest movements are a manifestation of the discontent felt by the citizens who believe they are being oppressed. They refuse to accept the ongoing regional inequality and social injustice, especially considering the lack of effective policies

151 Maple Razsa, **Bastards of Utopia: Living radical politics after socialism**, Indiana University Press, 2015. P 138.

152 Interview with CH. B, already mentioned.

from successive governments to tackle these issues¹⁵³. In Zarzis, the fishery community has been deeply affected by feelings of “despise”, which serves as a complete contradiction to the principles of dignity, respect, and equality. Moreover, it also brings to light other negative concepts such as clientelism, tyranny, corruption, bribery, and nepotism¹⁵⁴.

The act of struggle and protest is deeply ingrained in the seafarers’ commitment, however, the pioneers of food sovereignty failed to acknowledge the fishing sector during its early stages: “Although the visionaries and advocates of food sovereignty and agroecology presented significant solutions and recommendations for transforming the food system, it cannot be denied that these movements initially overlooked the significance of artisanal or traditional fishing. Presently, fishing organizations have become part of the Food Sovereignty and Agroecology movement.”¹⁵⁵

From the information presented, it can be inferred that fishermen experience a sense of inequality, and this perception of injustice serves as a catalyst for the emergence of protest movements. As a result, movements of resistance and perseverance are among the strategies employed to achieve progressive and transformative social change. Within any given protest movement, there are various expressions of needs and desires, which represent moments of liberation where individuals can voice their frustrations and aspirations¹⁵⁶. However, despite these efforts, many struggles have been met with disappointment and disillusionment. Therefore, it remains to be seen whether the coastal fishing community in Zarzis will maintain their optimism and confidence in the face of the challenges they face on the July 25, 2021 journey.

V. The State and the Coastal Fishing Community of Zarzis: Truncated Trust

Despite the lack of support from the government in terms of economic and social development, and the aftermath of an unsuccessful protest movement in the fall of 2022 that aimed to uncover the truth behind

153 Azzam Mahjoub, **Les inégalités en Tunisie**, Forum Tunisien pour les Droits Economiques et Sociaux, Tunis, 2022. P 67.

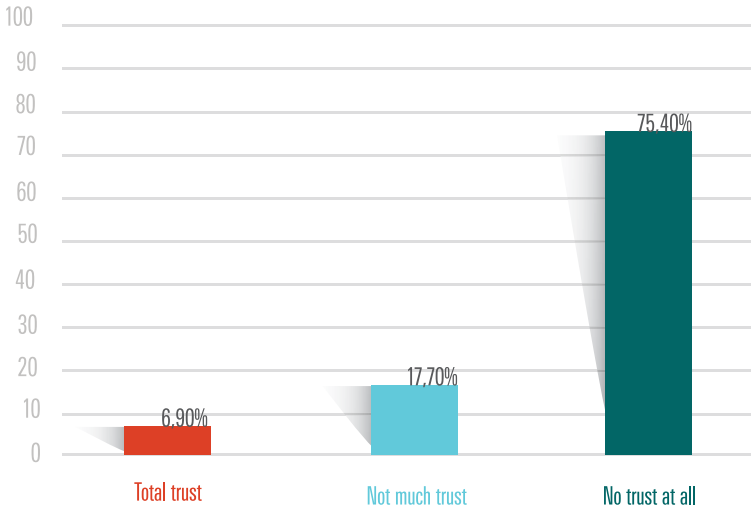
154 الحبيب استاتي زين الدين، **الفعل الاحتجاجي في المغرب وأطروحة الحرمان النسبي: في الحاجة إلى تنويع المقاربات التفسيرية**، عمران للعلوم الاجتماعية والإنسانية، عدد 22، المجلد السادس، خريف 2017، ص 165- 186، ص 171.

155 Azzam Mahjoub, Mohamed Mondher Beghith, **Op.cit.** P 103.

156 مانويل كاستلز، « شبكات الغضب والأمل: الحركات الاجتماعية في عصر الانترنت»، ترجمة: هايدي عبد اللطيف، المركز العربي للأبحاث ودراسة السياسات، بيروت، 2017، ص 308.

the sinking of a boat on September 21, 2022¹⁵⁷ and locate the missing individuals, does the coastal fishing community in Zarzis still have faith in the route of July 25, 2021?

Chart 16: The level of certainty expressed by the study samples regarding the trajectory of July 25th, 2021.



• Source: Field work.

The provided diagram illustrates the fractured and strained relationship between the government and fishermen, which can be attributed to the lack of economic, social, and political initiatives capable of fostering progressive and transformative changes. Kais Saied’s populism, akin to that of many right-wing populists worldwide, is characterized by several traits, notably the absence of concrete economic programs¹⁵⁸. Populist ideology often lacks specific political agendas and comprehensive visions, in contrast to more intricate ideologies, as its effectiveness lies in simplification rather than substantive depth¹⁵⁹. In the absence of pragmatic policies, Tunisia witnessed an unemployment rate surpassing 20% in July 2023, with 70% of those affected holding advanced degrees. By the end of the same month, approximately 980,000 families, or roughly one million families, were classified as needy or low-income,

157 Further reading about the Zarzis movement The reader can refer to: Khaled Tabbabi, **Op. cit.**

158 Ridha Boukraa, **Populisme et crise de la démocratie**, Ecrire l’histoire sociale de la sociologie en Tunisie, In Hamdi Ounaina, Med Ali Edition, Sfax, Tunis, 2021, pp 245- 262. P 261.

159 عبد اللطيف الهرماسي، تونس الثورة والمحنة: مقارنة من منظور علم الاجتماع السياسي، سوتيميديا للنشر والتوزيع، تونس، 2023، ص 267.

encompassing households of four members on average¹⁶⁰. Consequently, the absence of national and sovereign development plans and programs hampers the establishment of trust between the state and its citizens.

It should be emphasized that the numbers by themselves do not provide a comprehensive explanation. This analysis has its limitations, as certain individuals in Zarzis continue to hold onto hope for the July 25 route. M.A. expresses, "The events of July 25, 2021 should have occurred much earlier... I still maintain faith in the July 25 route."¹⁶¹ Similarly, CH.B asserts, "I still have optimism in the path of July 25, as there is no alternative. Although there have been mistakes and poor performance, there is no other option."¹⁶²

The recent testimony shows that trust in this political process is not linked to achievements and programs, but to alternatives and punitive logic. In a circumstance where the first decade of the Tunisian revolution (2011-2020) was characterized by political deception and social banditry, and thus the breaking of trust between party institutions and society. The "populist leader" who is alienated from official regulation becomes the alternative who will punish the financial oligarchy and corrupt political elite and place himself in the position of the sacred who will fight the profane. Therefore, populist President Kais Saied pursues "a strategy of manipulation that addresses emotions instead of minds, presents a frightening picture of the situation and its possibilities for development, and accuses the source of harm and evil, while maintaining the ambiguity of this source: the populist does not clearly identify his opponent or enemies, does not name them, and describes them with epithets such as treason, emphasizing his role as the protector of the homeland from conspiracies."¹⁶³

VI. Climate, environment and state withdrawal as factors for youth reluctance

In the fishing port of Zarzis and on a coastal fishing boat, CH.B. says: "I wish you (addressed in the researcher) to remain in the field and I hope to remain alive on this land and it will come in years and you will almost not find new generations in Zarzis working in coastal fishing."¹⁶⁴

160 Speech delivered by Minister of Social Affairs Malek Ezzahi on Monday, July 31, 2023, during a parliamentary plenary session in the House of Representatives in Bardo.

161 Interview with M, A, already mentioned.

162 Interview with CH. B, already mentioned.

163 عبد اللطيف الهرماسي، مرجع سابق، ص 268.

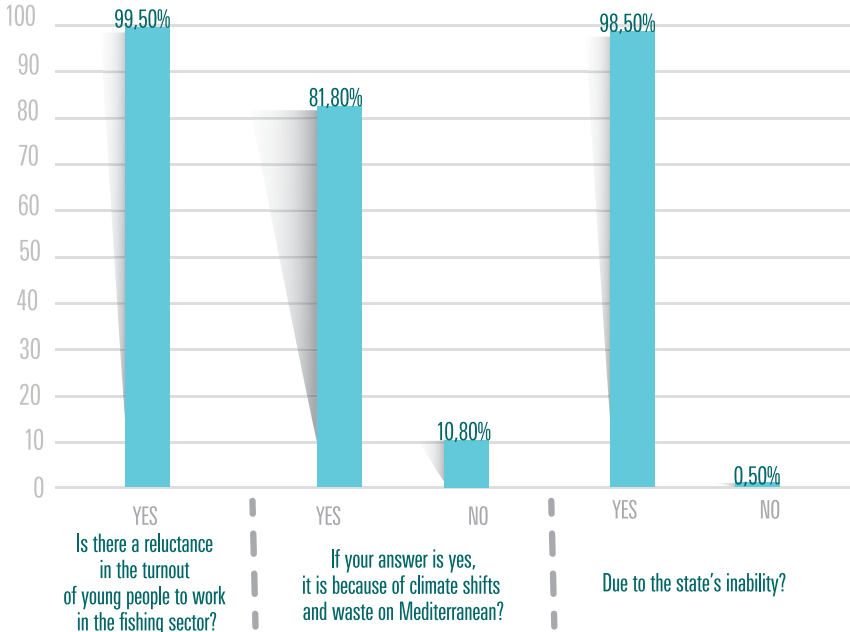
164 Interview with CH, B, already mentioned.

The testimony above suggests that the younger generation in Zarzis is hesitant to pursue the traditional profession of their ancestors. CH.B. sheds light on the reason behind this reluctance by stating that in the 90s, it was possible for a “Bahri” to start a family and build a house, but today, even meeting daily expenses is a challenge. Despite having worked at sea for over three decades, CH.B. did not encourage his son to follow in his footsteps due to the harsh reality of the coastal fishing sector.¹⁶⁵

This testimony indicates that the coastal fishing sector is witnessing migration, flight and reluctance, as this sector, which was attractive in the past, has now become repellent and no longer attracts young people, says M. A. : “The average age of workers in the coastal fishing sector in Zarzis is very advanced, as it is between 55 and 60 years, and in coastal fishing you will not find young people much, as people have abandoned this sector because it no longer meets social and economic needs.”¹⁶⁶

Many coastal fishing sailors in Zarzis attribute this trend to climate change, waste in the Mediterranean, and state deficits. These factors have contributed to the reluctance and flight of young individuals from the coastal fishing sector.

Chart 17: Reasons for the reluctance of young people to work in the fishing sector according to the study sample



• Source: Field work.

165 Interview with CH, B, already mentioned.

166 Interview with M, A, already mentioned.

The fishing sector faces significant obstacles, including a lack of supervision and inadequate training to keep up with industry developments. This gap between the sector and vocational training discourages young people from pursuing careers in fishing. H.J. notes that the fishing sector has undergone significant modernization in recent years, but vocational training has not kept pace with these changes. The pedagogical methods used in training are outdated and need to be renewed to meet the needs of seafarers and the industry as a whole. The program aims to provide internships and ongoing development opportunities for seafarers to keep their knowledge up to date¹⁶⁷.

The evidence presented in this testimonial highlights the shortcomings of the vocational training system in attracting young individuals to pursue training and education in the fishing industry. Furthermore, it indicates that the system lacks the capacity to effectively monitor and guide seafarers in enhancing their expertise and adapting to the latest advancements in science and technology within the fishing sector.

Conclusion

Following 2011, numerous governments pursued Tunisia and the country underwent significant political and sociological changes. Political parties and elites, regardless of their affiliations, put forth electoral agendas and commitments to overcome the

economic crisis and establish democracy, equality, and social justice. Tunisian economist Mahmoud Ben Ramadan highlights that the youth and marginalized regions are currently more impacted than they were prior to 2010, caught in a cycle of reaction and underdevelopment. The relationship between the country and its regions is characterized as a negative-sumgame.¹⁶⁸

In the context of the reactionary dynamic, the deficit, weakness and contraction of the state, the fishing community remained mired in suffering, as coastal fishing seafarers did not receive material or logistical support or financial compensation due to environmental injustice, whether after 2011 or after July 25, 2021. Seafarers also did not receive training courses and mentoring processes by the State

167 Interview conducted on May 10, 2023 at 15:31 at the School of Fisheries in Zarzis, with H, J, Director of the Vocational Training Center for Fisheries in Zarzis.

168 Le jeu est un jeu à somme négative, Mahmoud Ben Romdhane, « **Tunisie : La Démocratie en quête d'Etat** », Sud Editions, Tunis, 2018. P 151.



that were supposed to enable them to keep pace with modern fishing techniques and develop their knowledge and skills. In the context of the withdrawal of the state, fishermen suffer from piracy and extortion, and their fishing trips have become risky and characterized by feelings of fear due to the absence of control and the silence of the state and its lack of intervention in order to provide protection for fishermen. On the other hand, the Tunisian state did not reconsider the unfair division of borders between and with neighboring countries (Algeria and Libya), and thus fishermen remained stranded in a maritime desert.

Seafarers, despite being marginalized, are carrying out their duty to humanity by standing on the front lines of irregular migration journeys. They provide assistance in saving human lives and towing fragile and distressed boats to land. However, after the rescue, they face malicious charges due to national and European policies that criminalize these humanitarian acts. These policies have turned noble and humanitarian acts into criminal acts through an arsenal of “discriminatory, racist and unjust” laws. As a result, fishermen’s boats are detained or punished by paying a fine, arrests, forensic research, or oral warnings that emphasize non-intervention and saving human lives automatically without informing the security units.



Chapter IV:

The Immigration Choice within the Coastal and Artisanal Fishing Community in Zarzis and Boughrara.

Introduction

The preceding chapters have made it evident that the study population is adversely affected by climate change and the degradation of ecosystems. The negative impacts include rising temperatures, ocean acidification, pollution of the Mediterranean Sea due to extractive waste, and the destruction of the seabed caused by indiscriminate fishing. These factors have all contributed to the depletion of marine resources and fisheries. Additionally, the escalation of sea storms compels fishermen to refrain from sailing for extended periods, resulting in reduced working and fishing days throughout the year. On the other hand, in their pursuit of fish using traditional methods, fishermen are compelled to embark on long voyages that do not yield a favorable balance between costs and profits. Consequently, climate and environmental changes exacerbate the already precarious economic and social conditions faced by coastal and artisanal fishing seafarers.

Despite the challenges faced by the Tunisian fishermen, such as waste pollution in the Mediterranean, pirate extortion, and the absence of social laws protecting their rights, we are witnessing the Tunisian state's withdrawal and its inability to address the social and economic issues. This has resulted in an increase in protest movements and a breakdown in trust between the fishermen and the government.

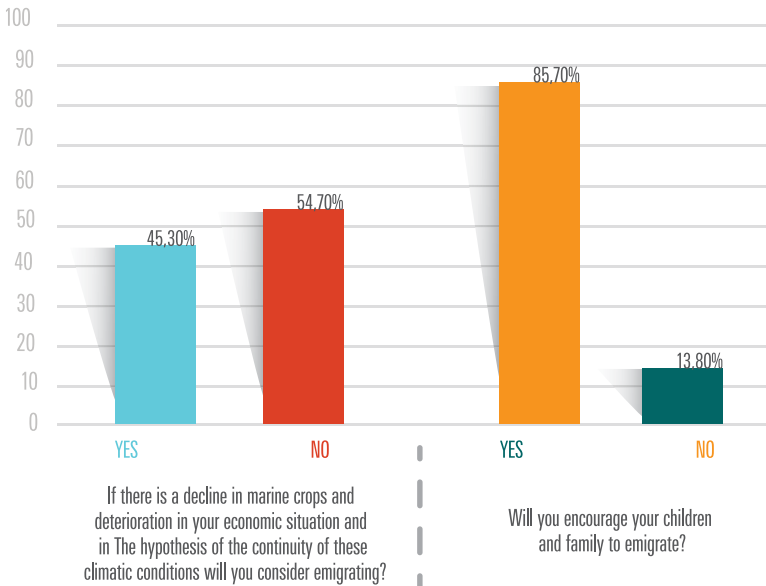
Considering the worsening economic and social conditions caused by climate change, environmental injustice, and the Tunisian state's retreat, along with the growing feelings of discontent, resentment, and deprivation, there is a unique local aspect in Zarzis represented by its Immigration heritage. In this context, can Immigration projects serve as alternative solutions to tackle climate and environmental changes, address the inaction of authorities, and combat pirate extortion and militia influence?



I. The impact of climate change on immigration aspirations and plans

After addressing various concerns regarding climate change, the depletion of marine resources, and the worsening economic and social circumstances faced by coastal fishermen in Zarzis, it became evident that there exists a correlation between climate change and economic decline. Consequently, a pivotal question was posed in the research: Would you contemplate migrating and would you advocate for your children to do the same, irrespective of the legality of such migration?

Chart 18: The impact of climate changes on the decision to immigrate, as reported by the surveyed individuals



• Source: Field work.

The coastal fishing industry is predominantly made up of experienced seafarers who often express their reluctance to emigrate due to their long-standing involvement in the sector. However, they do encourage their children and family members to migrate to Europe and avoid working in coastal fishing. The statistical data obtained through the Khi-deux test indicates a significant correlation between climate change and the tendency to encourage emigration among families¹⁶⁹.

169 See Appendix No. 2, P 88.

However, the Traps workshops fail to fulfill the economic and social aspirations, as well as the hopes and ambitions of the youth. The state's withdrawal from supporting the capacities of peasant women and youth, coupled with the lack of innovative development projects that promote the agricultural and fishing sector, has resulted in the inability of M.C.'s¹⁷⁰ brother to continue working in the Traps workshop in the Boughrara region. The region's unique characteristics, coupled with the absence of several sociological life constituents, and the state's inability to innovate development projects that can preserve it, have made it impossible for him to stay in Tunisia, particularly in Boughrara. In 2022, M.C.'s brother decided to migrate to the Mediterranean in an irregular manner, and he was eventually placed on the northern shore of the Mediterranean by a boat. As a result, even innovative projects aimed at adapting to invasive species and climate change are insufficient to deter migration projects, whether formal or irregular.

The phenomenon of climate migration is not limited to just the Zarzis Peninsula, the Boughrara region, and coastal and traditional fishing communities. It is a global trend that is closely tied to climate change and its impact on vulnerable populations. According to Professor José Liliéveld and his colleagues at the Cyprus Institute, the frequency of extremely hot days in the Middle East and North Africa has already doubled since 1970 and could potentially quadruple by the end of this century. This alarming trend is expected to result in a significant increase in the number of climate refugees in the future¹⁷¹. Over the past few decades, forced climate migration has been on the rise, and it is projected that the number of international migrants, which stood at around 25 million in 2007, could soar to 200 million by 2050¹⁷².

II. Random fishing and the immigration decision

A chance encounter with local fishermen in Zarzis reveals their frustration with illegal fishing practices and the damage it causes to the seabed. Many of them are calling for government intervention to prevent further harm and protect their livelihoods. S.K. emphasizes the urgency of the situation, stating that if action is not taken, many fishermen may be forced to sell their boats and abandon the coastal fishing industry. He

170 Interview, with M.C. already mentioned.

171 حمزة حموشين، مرجع سابق، ص 103.

172 Taoufik Gammoudi, **Contribution à l'étude d'impact de changement climatique sur la migration de la population rurale du Sud-Est Tunisien**, *Revue des économies Nord Africaines*, n°14, 2016, pp 21- 34. P 22.

also notes that this may not necessarily lead to immigration, as many of the fishermen are older and may not have other options for work¹⁷³.

The practice of uncontrolled fishing is a contributing factor to the reluctance of coastal communities to engage in fishing activities. This type of fishing has also become a driving force behind the decision of individuals and families to migrate to other countries. According to a survey, 45.50% of respondents stated that they would consider emigrating if the current unsustainable fishing practices continue. The percentage increases to 84.80% when it comes to families with children, as they are more likely to encourage their loved ones to leave their place of origin.

III. The shift from the polluter pays principle to the consumer pays principle and the immigration decision

The “polluter pays” principle, as outlined in Principle 16 of the Rio Declaration of 1992, emphasizes the responsibility of national authorities to encourage the

internalization of environmental costs and the adoption of economic tools. This principle recognizes that the burden of pollution should primarily fall on the polluter, while also considering the public interest and without undermining international trade and investment¹⁷⁴.

By analyzing both quantitative and qualitative data, as well as observing the Zarzis Peninsula, it is evident that the Tunisian government failed to uphold the principle of “polluter pays” and instead allowed the sea to become a dumping ground for waste, resulting in environmental injustice towards poor fishing communities. This has transformed the principle to a “consumer pays” approach¹⁷⁵. If the environmental balance continues to be disrupted by extractive and polluting industries such as the chemical complex and COTUSAL, the decline of marine resources and socio-economic conditions will persist. As a result, 45.30% of respondents are considering emigrating, with 78.80% stating that they would encourage their families and children to leave if environmental injustice persists. The results of the chi-square test¹⁷⁶ confirm a direct

173 Interview with S, K, already mentioned.

174 حسين الرحيلي، ورقة سياسات حول مبدأ العهدة على الملوث، جمعية نوماد 08 بالشراكة مع جمعية مواطني بيتي، جمعية نخلة وسوليدار تونس في إطار ائتلاف «من أجل حوكمة عادلة ومواظبة للمواد الطبيعية»، وذلك بالتعاون مع مشروع الديمقراطية في الشرق الأوسط، POMED، مارس 2021، ص 4.

175 For more reading, the reader can refer to: Hussein Al-Rahili, «مبدأ العهدة على التلوث»، **Op. cit.**

176 See Appendix No. 3, P 89.

statistical causal relationship between environmental injustice and the migration decision of seafarers' families and children. Migration is a basic strategy ingrained in the collective memory of families and societies as a means of adapting to environmental conditions or reacting to rapid changes in these conditions, particularly in arid environments¹⁷⁷.

In order to strengthen sociological findings and avoid making assumptions and oversimplifications, certain scholars argue that environmental degradation, such as marine pollution on Kerkennah Island and global warming, has diverse effects on various ecosystems. These effects, in turn, impact traditional activities like fishing and agriculture, ultimately leading to the migration of numerous populations¹⁷⁸. The environmental injustice that has resulted in the decline of marine resources and the worsening economic conditions of coastal fishermen in Zarzis serves as a catalyst for the decision to migrate, and it also contributes to families discouraging their children from staying.

Women's decision to migrate irregularly is often influenced by environmental injustice. The pollution, climate and environmental factors, social inequality, and nepotism policies have had a devastating impact on the waters near Djerba and Zarzis, particularly in the Gulf of Boughrara. Despite these challenges, many women still dream of embarking on a Mediterranean adventure and reaching the northern

bank. A.K. explains that she would be willing to make the journey if she could afford it, as she comes from a maritime family and is not afraid of the sea. However, for now, she is encouraging her brother to take the risk instead¹⁷⁹.

In the face of environmental degradation and the potential consequences of climate change, the distinction between voluntary and forced migration becomes increasingly challenging¹⁸⁰. It is crucial to acknowledge that the reasons behind migration extend beyond economic and social factors, as climate change and environmental degradation emerge as the primary drivers compelling individuals to relocate¹⁸¹. Consequently,

177 Abdelala Bounouh, Sonia Gsir, **Op.cit.** P 31.

178 Ibid. P 30- 31.

179 Interview with A, K, already mentioned.

180 Taoufik Gammoudi, **Op.cit.** P 22.

181 Barbara Bendandi, **Migration due au changement climatique et à la dégradation de l'environnement sur la route de la Méditerranée centrale**, Migration en Afrique de l'Ouest et du Nord et à travers la Méditerranée : tendance migratoire, risques, développement et gouvernance, OIM, Genève, 2021, pp 338-350. P 344.



we can propose the hypothesis that the world will witness a significant impact from environmental migrations in the forthcoming decades. This notion is supported by the renowned American sociologist Robert Doyle Pollard, widely recognized as the “father of environmental justice¹⁸²,” who predicts that the number of environmental refugees could potentially reach approximately 150 million people by 2050. Pollard asserts that climate change is poised to become the central focus of global environmental justice in the twenty-first century¹⁸³.

IV. The role of the state in shaping immigration decisions

1. The state’s influence on immigration choices through lack of support and ongoing pressure.

The lack of investment in the coastal and recreational fishing industry, the neglect of this sector on the state’s agenda, and the absence of necessary resources and support for fishermen will contribute to the decision to abandon their profession. According to a survey, 43.80% of respondents stated that if the state does not provide support to the coastal fishing sector, they would contemplate emigrating, while 76.80% would encourage their children and families to do the same.

Furthermore, the state’s silence regarding the killings and extortion of hunters by pirates has resulted in the initiation of family migration plans. Consequently, the ongoing violence, extortion, and lack of security serve as significant factors motivating the decision to migrate, whether it be for the sailors of Zarzis or their families and children. Assuming piracy continues, 47.20% of coastal fishing sailors in Zarzis would consider emigrating, and 83.20% would urge their families to make the migration decision.

Despite the decline in their economic and social conditions and the reduction of government support, it is important to highlight that social coverage does not serve as a strong motivation or incentive for coastal fishing sailors in Zarzis. Out of the total respondents, 54.12% did not have social coverage. Among them, 97 respondents, which is equivalent

182 Robert Doyle Bullard, renowned as the Father of Environmental Justice, holds the distinction of being the foremost researcher on this pressing environmental issue from a sociological standpoint. He is also recognized as one of the trailblazers in the fight against environmental racism and a dedicated advocate within the environmental justice movement that gained momentum in the United States during the 1980s.

183 Philippe Boudes, «**Sociological Perspectives on Global Climate Change : Compte rendu de document (National Science Fondation, 2009)**», *Natures Sciences Sociétés*, n°3, vol 18, 2010, pp 337-340. P 339.

to 50% of the sample, expressed no intention to migrate outside the country despite lacking social coverage. However, when it comes to their children and families, it is noteworthy that seafarers without social coverage (106) are the most inclined group to migrate their children and families abroad, accounting for 83.16%.

On the other hand, marital status and occupation are significant factors influencing the decision of fishermen regarding migration. It is observed that singles are the most willing group to migrate, comprising 26.53% (52 out of 196) of the total respondents. Additionally, the seaman profession is the most desired occupation for self or family migration, with 52.25% expressing this preference.

2. Youth participation in immigration projects and vocational training courses

Despite the challenges faced by the state in providing vocational training opportunities in the fishing sector, the Environmental Development Association of the Sea has taken steps to train young people and encourage them to work in this field. However, despite these efforts, many young people in Zarzis have still chosen to emigrate. S.K. reports that after 2011, the Association trained 56 young people in diving and provided them with certificates, but today only a few remain in the area. The rest have opted to migrate, whether through regular or irregular means¹⁸⁴.

With the same idea, M.A. adds: “We at the Environmental Development Association of the Seas and in 2015 we trained 50 people from Zarzis in mechanics, and today we do not have anyone, almost all of them migrated irregularly, they obtained certificates at that time and worked at sea but did not find profits at sea to meet their social and economic needs, the sea does not create a better future for them and they cannot be blamed because it is their right to improve their future.”¹⁸⁵

The withdrawal and inability of the state leads to the transition of young people from genetic fishing work to the search for better opportunities in the industrialized countries of the North, and this may leave the hypothesis of desertification of the coastal fishing sector in the future. “As long as there are no investments, encouragements, assurances and faith in the ability of young people, migration will not stop, as the prospects are blocked. We are now almost done working at sea, and I

184 Interview with S, K, already mentioned.

185 Interview with M, A, already mentioned.

don't think there is another generation that will work in fishing, here we find an aging age in the sector, previously we worked with our parents and we loved the sea and fishing, and now there is reluctance, now in our boats and during our work the most common topic is "migration" because it represented an option, although it is characterized by painful stories, but it represented another option for young people."¹⁸⁶

V. Debt: either prisons or boat sale to displacement networks

When boat owners are burdened with significant debt, they are faced with two choices: imprisonment or selling their boats for irregular migration purposes. Opting for the latter allows them to settle their debts, but it also means giving up their livelihood¹⁸⁷. Regarding the possibility of selling their boats to displacement networks or organizing an irregular migration journey, M.A. explains that the decision is quite straightforward: "Migration"... In coastal fishing, the cost of equipment is exorbitant. For instance, around 15 to 20 years ago, the expenses for shrimp or octopus season in the seas ranged between 30 and 40 million Tunisian dinars. Today, the cost has skyrocketed to approximately 100 and 120 million dinars. Additionally, there has been a decline in marine resources, and the expenses for gasoline and equipment have increased. These factors have led many sailors to face difficulties with suppliers. It is not uncommon to find sailors drowning in debts worth 30 to 40 million dinars or even more. Suppliers may show patience for a year or two, but as debts continue to accumulate, their patience wears thin. Moreover, sailors also have daily and social living expenses to contend with. Hence, the equation becomes simple: there exist sailors who have made the choice to sell their boats to displacement networks or those who are orchestrating the irregular migration voyage. They do so in order to settle their debts and subsequently acquire another smaller boat.¹⁸⁸

In Zarzis, it is unfortunately common to hear stories of fishermen selling their boats to displacement networks. One fisherman explains that the process involves legally purchasing a boat from the Merchant Marine and Ports Office, and then reselling it to the networks while reporting it as stolen¹⁸⁹. This practice is coordinated with the state, as the boats are taken to the island of Lampedusa¹⁹⁰.

186 Interview with CH.B., already mentioned.

187 Zoé Debussy, Raphael Cuneo, **Op.cit.**

188 Interview with M, A, already mentioned.

189 Zoé Debussy, Raphael Cuneo, **Op.cit.**

190 Interview with CH, B, already mentioned.

Selling one's livelihood is not a choice anyone would willingly make. However, the circumstances, such as the fear of being unable to repay debts and the risk of imprisonment, push some fishermen to view it as a necessary action rather than an option. The absence of support from the state and the hardships faced by the fishing

community may drive them to sell their boats to displacement networks. It is important to note, though, that this does not mean that fishermen are the driving force behind irregular migration trips. The lack of state presence, coupled with the changing climate and environmental conditions in the Mediterranean Sea, has created an environment where pirates and large ships thrive. Additionally, the financial burden on small fishermen makes them vulnerable to engaging in irregular migration projects, either by selling their boats to displacement networks or by organizing such journeys themselves.

VI. The triad of climate, environment, state and development of projects and migration intentions

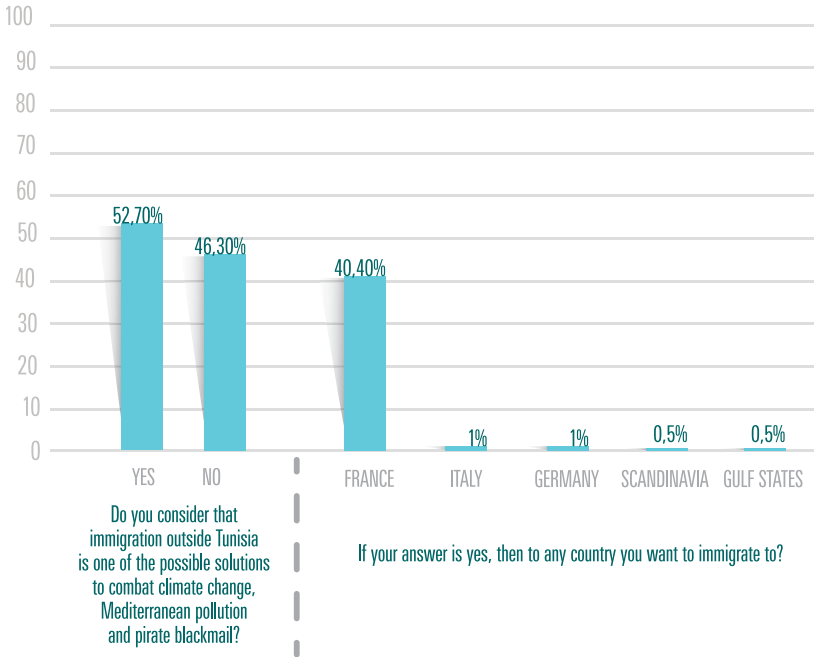
CH.B. succinctly describes the dire state of the coastal fishing industry using a local proverb: "Dry pants dry pocket." This proverb signifies that when water stains are found on a sailor's trousers, it indicates that he has earned money and profits from a fishing expedition. Conversely, if the sailor's clothes are clean and fragrant, it implies that he is lacking in funds¹⁹¹.

Numerous fishermen experience a sense of injustice, suffering, and anguish, leading to an increasing sense of fear and anxiety. A staggering 97.50% of the surveyed individuals expressed concern regarding climate and environmental changes, as well as the violence inflicted by certain pirates along the borders. In the midst of this fear, seeking an alternative space where dreams can be realized emerges as a potential solution. Approximately 52.70% of the respondents agree that immigration is one such alternative to combat climate change, environmental injustice, and the threats posed by these pirates. When asked about their preferred destination countries, a majority expressed a desire to immigrate to France.

191 Interview with CH, B, already mentioned.



Chart 19: Migration as an alternative solution and the countries preferred by the research sample



• Source: Fieldwork

Zarzis sailors have a preference for migrating to France, thus it becomes imperative to comprehend the hypothetical geography of prospective destination nations and grasp the underlying factors behind this inclination¹⁹². This understanding allows us to gain insight into the significance that migrants attach to their departure from a particular place, as well as the driving forces and motivations behind their decision to migrate.

The preference of citizens and sailors from Zarzis for European countries, particularly France, can be attributed to the early establishment of communities and the solidarity networks formed by the Zarzis community in these receiving countries. Social networks and circles play a significant role in influencing the choice of destination. The Zarzis region is known for being one of the most prominent areas in Tunisia from where people have migrated to Europe, especially France. It is rare to find a family in Zarzis without at least one member residing abroad. The migration trend from Zarzis to France can be traced back

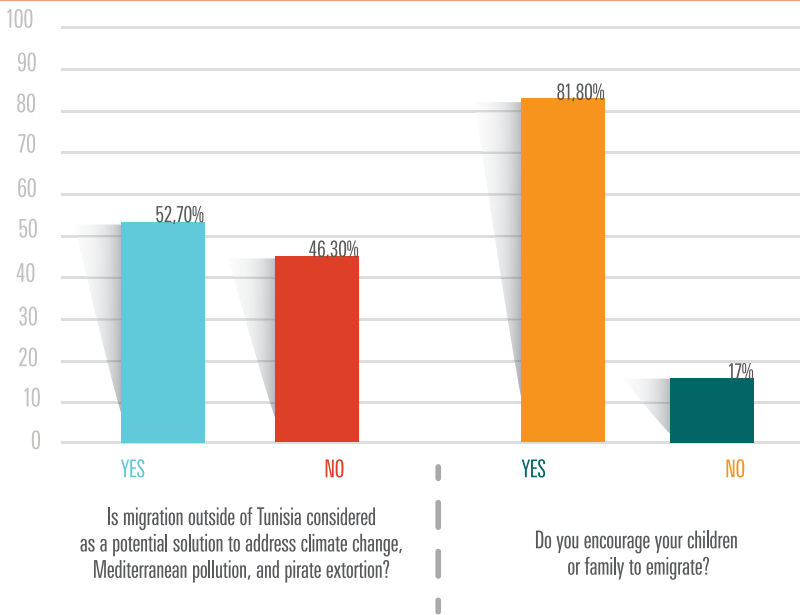
192 Etienne Piguet, **Les théories des migrations. Synthèse de la prise de décision individuelle**, Revue européenne des migrations internationale, vol 29, n° 3, 2013, pp 141, 161. P152.

to the post-colonial era, driven by economic fragility. The region has experienced both internal migration towards Tunis and coastal areas, as well as external migration towards France and Libya. The search for employment opportunities stands out as one of the primary reasons behind these migrations¹⁹³. Therefore, the historical migration of Zarzis citizens to France,

influenced by the strength of local community circles, significantly impacts the decision to migrate and the choice of destination. The study sample reveals that fishermen with relatives abroad exhibit the highest willingness to emigrate (83.51%), while the overall percentage of individuals with relatives abroad is estimated at 59.04% (111 out of 188).

Conversely, seafarers who engage in coastal fishing advocate for their families and offspring to relocate as a viable strategy to address the issues of climate change, pollution in the Mediterranean, and piracy.

Diagram 20: Motivating the family and children to emigrate according to the questioned sample



Source: Fieldwork

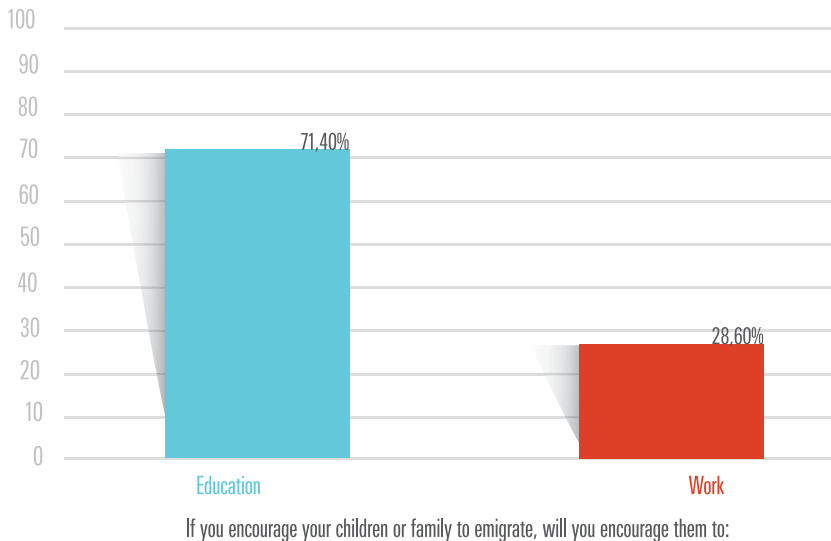
193 ريم الخويلدي، خصائص الهجرة والمهاجرون في الجنوب الشرقي التونسي: مدينة جرجيس مثالاً، بحث لنيل شهادة ماجستير في علم السكان، إشراف: إيمان الكشباتي، كلية العلوم الإنسانية والاجتماعية بتونس، جامعة تونس، السنة الجامعية: 2018-2019، ص 16، 26، 27.

Similar to other Tunisian households, the Zarzis family holds significant influence in the decision to migrate. A study revealed that the family in Zarzis plays a pivotal role in supporting the choice to emigrate, both financially and morally. Encouragement from family members accounted for 47% of the respondents, with 20.1% receiving encouragement from their mothers, 20.4% from their fathers, and 0.07% from their brothers. Additionally, 18.3% attributed their decision to friendship networks, while 13.9% cited encouragement from kinship networks¹⁹⁴. Interestingly, the study also found that among the respondents, who were predominantly married individuals representing 62%, only 18.87% expressed a desire to emigrate (37 out of 196).

However, when it came to their children and families, married couples took the lead with 52.28% (103 out of 197), driven by their aspiration for a better future. Despite the challenges faced by the local community, the Zarzis family remains steadfast in their belief in the value of education and encourages their children to acquire

knowledge. They recognize that the Tunisian education system no longer serves as a means of social mobility, but they still view it as one of the most crucial institutions for establishing a respectable life, even though this is not currently realized within the Tunisian state.

Graph 21: Reasons for encouraging migration according to the study sample



Source: Fieldwork

194 ريم الخويلدي، مرجع سابق، ص 102.

The Zarzis family, like many others in the fishing community, places great importance on education, highlighting their cultural and educational values. This belief is shared by fishermen across all educational levels. Analyzing the educational level index, we observe that individuals with a secondary or primary education level, comprising 50.52% of the sample, express a strong desire to emigrate individually. Furthermore, 82.92% of this group confirmed that they would encourage their children and families to emigrate if the current climatic and environmental conditions persist (161 out of 194 respondents). Interestingly, the surveyed sample lacks representation from individuals with a university degree, as the fishing sector does not typically attract such individuals.

Considering the historical patterns of immigration and the presence of solidarity networks, France remains the primary and most significant destination for immigration, settlement, work, and education. A substantial 77.10% of respondents express their intention to encourage their children and families to immigrate and pursue education in France. Germany follows with 10.80%, Canada with 7.80%, and Italy with 3.60%.

Conclusion

As a result of climate change, ecosystem degradation, and lack of action from authorities, the economic and social circumstances of the fishing community have worsened. With limited options to combat climate and environmental changes, migration has emerged as a potential solution to escape a reality plagued by vulnerability, poverty, and deprivation.

Considering the aging workforce in the fishing industry, seafarers themselves may not have a strong desire to emigrate. However, this perspective changes when it comes to their families and children. The idea of migration becomes both repellent and enticing for families, as many fishermen believe that the continuation of climate and environmental changes, coupled with the state's inability to address these issues and protect against piracy, will further deteriorate their social standing. Consequently, migrating to a place where their dreams can be realized becomes one of the alternative solutions for their families and children. Rather than encouraging their families and children to follow in their ancestral profession, they motivate them to pursue education and employment opportunities outside their place of origin.

As a result of France's historical and early migration, the establishment of a Gergesian community (Akkeri)¹⁹⁵ in the reception home of Paris, and the strong local solidarity networks, fishermen who aspire to emigrate are inclined to choose France as their destination. This inclination remains unchanged when it comes to families, as they encourage their children to pursue education and employment opportunities in Europe, particularly in France.

Unfortunately, the unfair laws that fail to protect the rights of small-scale and coastal fishermen, coupled with the adverse climatic and environmental conditions that have led to the depletion of certain fish species and marine resources, have rendered coastal fishermen vulnerable. Consequently, many fishermen find themselves burdened with insurmountable debts, leaving them with two options: either facing imprisonment or resorting to selling their boats to displacement networks. Thus, it can be argued that the policies and economic and legal models implemented by the government, which disregard the interests of small-scale fishermen, have inadvertently facilitated the operations of local displacement networks.

The decision to migrate irregularly from Tunisia is influenced by a variety of factors, including economic, social, and security concerns, discriminatory migration policies, and the frustration of protest movements. Additionally, the psychological impact of

the country's post-2011 situation and the disparity between reality and aspirations contribute to the decision. While these factors are significant, environmental and climatic factors, as well as the strength of local social networks, also play a role in catalyzing the decision to migrate. Therefore, it is undeniable that the environment and climate are important factors in shaping the immigration landscape in Tunisia.

195 Akkara: an ancient and historic tribe of Zarzis.



General conclusion

The decrease in fisheries in Medenine governorate can be attributed to various factors such as climate change, environmental injustice, indiscriminate fishing, and the inability to fish safely in Tunisian-Libyan joint fishing areas. Additionally, the failure of fishermen to sail in Libyan maritime areas and the artisanal nature of fisheries of noble and targeted species have also contributed to the decline. Despite the presence of blue fish, particularly sardines, and the recognition of the port of Zarzis as a top-notch port for blue fish in the region, the production of blue fish has decreased by 50% since 2018. Other species like sponges have also decreased by 67%, while fishing and production in aquaculture have decreased by 17% and 49%, respectively, after the closure of aquaculture units¹⁹⁶. These statistics have led some coastal fishing sailors in Zarzis to consider the immigration decision and contemplate migration projects for their families and children. Hence, alterations in climate and the environment will not solely impact food production or natural resources. Climatic events, particularly those undergoing rapid changes and posing challenges to adaptation, will inevitably result in the displacement of populations from specific regions (such as Zarzis, Boughrara, and others) that are susceptible to the consequences of rising sea levels, inadequate rainfall, extreme temperatures, intensified ocean storms, and unpredictable weather patterns. Moreover, these disruptions can potentially trigger civil conflicts, particularly within marginalized communities heavily reliant on fishing and excluded from political engagement¹⁹⁷.

The fishing community in Tunisia is facing a delayed response from the Tunisian state in the face of climate change, ecosystem degradation, and worsening economic and social conditions. The state has failed to establish adequate measures to address the crisis in the fishing sector, leading to the absence of support and withdrawal of the



196 Hervé Bru, Marouane Chikhaoui, **Op.cit.** P 10.

197 Azzam Mahjoub, Mohamed Mondher Beghith, **Op.cit.** P 117.

state. Consequently, local networks have gained strength, compelling fishermen and their families to consider migration as a viable option.

Based on the aforementioned analysis in this study, we can substantiate the research hypotheses by stating:

The emergence of the immigration decision and the increase in migratory intentions, both individually and among coastal fishing sailors in Zarzis, can be attributed to a combination of factors including climate change, uncontrolled development, and the authorities' inaction. The shores of Zarzis have become a hub for indiscriminate fishing and piracy, further exacerbating the situation. The coastal fishing sector in

Zarzis and the artisan in Boughrara are no longer able to meet the sociological needs of living due to climate and ecological changes, as well as the lack of effective socio-economic plans from the political authority. It is clear that a more evolutionary approach to political and economic solutions is needed to address these complex issues.

The Zarzis community, along with the civil society in Medenine Province, possesses a rich historical Immigration culture and traditions. The Zarzisian communities were established during the early years of the State of France, with Paris serving as its capital. This Immigration culture has significantly contributed to the resilience of local community networks, especially during the challenging times faced by the coastal and artisanal fishing sector. The sector is currently grappling with economic, social, environmental, and climatic crises, which have a profound impact on the initiation and growth of projects as well as migration intentions.

The rise in demand for transit to Europe is a direct result of the absence of regular migrant channels and the failure of European migration policies, which have resulted in the loss of human lives. Meanwhile, the supply of fishermen seeking alternative resources is also increasing. However, it is important to note that fishermen are not the sole driving force behind irregular migration. The laws that serve only the interests of capital and large boat owners contribute to the impoverishment of seafarers and their entrapment in debt. To prevent them from falling into the trap of prison, one solution is to sell their boats to displacement networks.

The impacts of climate change and environmental inequality are not only influenced by social and territorial disparities (North-South), but also by gender. In the midst of social and environmental injustice,

and the government's inability to provide effective solutions, women working in the agricultural sector in Boughrara bear the brunt of poverty, frustration, and deprivation. They are the most vulnerable group affected by unjust national and global policies. As a result, some peasant women view migration as their last resort to confront climate and environmental changes and to pursue their shattered dreams in a new land.

In an era of climate change, degradation of ecosystems, and the conversion of the sea into a national and global dumping ground, the presence of large ships disregarding fishing seasons and ecological balance, and a political system unable to address social and national issues or offer climate change adaptation solutions, migration becomes intertwined with the interplay of climate and environment. Consequently, both legal and irregular migration in Tunisia cannot be detached from the dynamics of climate and ecological transformations.

To summarize, considering the food sovereignty approach, it can be concluded that despite the significance and position of the fisheries industry in the Tunisian economy, it falls short in meeting domestic demand and promoting Tunisian consumption of fish and seafood products, which remains below the global average. Consequently, it is crucial to prioritize the coastal and artisanal fishing sector in agricultural and food policies, aligning with the principles of food sovereignty. It is worth noting that this sector employs three-quarters of the workforce and contributes just over a third of the national production. Therefore, it necessitates special attention to enhance its contribution to national production, improve fishermen's incomes, ensure better social protection and safety at sea, and preserve fisheries resources in line with environmental and sustainability requirements¹⁹⁸. As the fisheries sector plays a significant role in Tunisian agriculture and fish is a staple food for Tunisians, food sovereignty presents a comprehensive agricultural approach to managing nutrition-related decisions and social control. It also highlights the importance of maintaining a sustainable and affordable food supply to urban areas, while supporting the national sovereignty project¹⁹⁹. Therefore, prioritizing the fisheries sector in food policies and viewing it through the lens of food sovereignty is a crucial project that can pave the way for economic, social, and political development. This can be achieved by preserving fish resources, providing social protection for fishermen, and ensuring affordable food for all Tunisians.

198 Azzam Mahjoub, Mohamed Mondher Belghith, **Op. cit.** P 107.

199 حبيب العايب، في أصول التبعية الغذائية في تونس: نموذج كولونيالي لا يزال قائما، في التبعية الغذائية في البلاد العربية: جذورها وأبعادها تونس والمغرب وفلسطين نموذجا، تنسيق: حبيب العايب، محمد الأزهر الغربي، ماكس أجل، مرصد السيادة الغذائية والبيئية، تونس، 2022، ص 41-66، ص 62.



APPENDICES

Appendix 1

Distribution of Fishing Units by Ports in Medenine Governorate

ALk Stef	Algrine	Bouhrara	Ajim	Aghir	Houmet Souk	Hassi jleba	Zarzis	
140	107	175	352	205	708	108	998	Coastal fishing
0	0	0	0	0	0	0	19	Blue fishing
0	0	0	0	0	0	0	3	Trawling
0	0	0	0	0	0	0	4	Tuna fishing
0	0	0	0	0	0	0	3	Aqua-culture
140	107	175	352	205	708	108	1027	Total

Source : Hervé Bru, Marouane Chikhaoui, Op.cit. P 13.

Appendix 2

The causal connection between climate change and the impetus for families and children to relocate to another country.

Test Khi-deux de Pearson

		Would you consider leaving your home if the marine crops decrease and your financial situation worsens due to ongoing climate changes?	
Will you encourage your children and family to emigrate?	Khi-deux	,010	
	df	1	
	Sig.	,019	

• Source: Field work.

Appendix 3

The correlation between environmental pollution and the emergence of migration aspirations and plans.

Test Khi-deux de Pearson		
		Will you encourage your family to emigrate?
Do you consider that the salt sabkha of the Tunisian General Shipping Company (COTISAL) has contributed to the pollution of the sea and the decline of marine wealth?	Khi-deux	4,744
	df	1
	Sig.	,029*,b
Do you consider that the discharges issued by the chemical complex in Gabes have contributed to the pollution of the sea and reduced the fish stock?	Khi-deux	5,807
	df	1
	Sig.	,016*,b
Do you consider that wastewater discharges into the Mediterranean Sea and by ONAS have contributed to sea pollution and the decline of marine crops?	Khi-deux	7,228
	df	1
	Sig.	,007*,b,c

• Source: Field work.



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