

Journal of international and digital communication:
Sustainability perspectives

Special Issue 2/2024

Theoretical
Impulses + Case
Studies

Interdisciplinary Perspectives on the Interplay between Human Rights and Sustainability

Prof. Dr. Milena Valeva,
Prof. Dr. Kathrin Nitschmann (Ed.)

InDi 

Institut für Internationale &
Digitale Kommunikation

Trier University
of Applied Sciences

H O C H
S C H U L E
T R I E R

Prof. Dr. Milena Valeva,
Prof. Dr. Kathrin Nitschmann (Ed.)

Interdisciplinary Perspectives on the Interplay between Human Rights and Sustainability

Theoretical Impulses and Case Studies

Journal of international and digital communication:
Sustainability perspectives

Special Issue 2/2024

InDi 

Institut für Internationale &
Digitale Kommunikation

Trier University
of Applied Sciences

H O C H
S C H U L E
T R I E R

Impressum



Hochschule Trier, Umwelt-Campus Birkenfeld
Fachbereich Umweltwirtschaft/Umweltrecht



Contact:

Campusallee, Gebäude 9916
55768 Hoppstädten-Weiersbach
Deutschland

+49 6782 17-1819
info@umwelt-campus.de
www.umwelt-campus.de

ISSN 2940-1992

© Editors Trier University of Applied Sciences,
Environmental Campus Birkenfeld, 2024

This is an open access manuscript under the terms of the Creative Commons Attribution-NonCommercial License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited and is not used for commercial purposes.

Bibliographic information from the German Library: The German Library lists this publication in the German National Bibliography; detailed bibliographic data is available on the Internet at www.dnb.de.



Institut für Internationale und Digitale
Kommunikation

Contact:

Bibliothek der Hochschule Trier,
Umwelt-Campus Birkenfeld
Publikationsservice: Open Access Server

+49 6782 17-1477
bibliothek@umwelt-campus.de
[www.umwelt-campus.de/campus/organisation/
verwaltung-service/bibliothek](http://www.umwelt-campus.de/campus/organisation/verwaltung-service/bibliothek)

Layout and editorial design:

Nina Giordano
www.nina-giordano.com

Images and icons:

Adobe Stock
The Noun Project



We would like to thank proWIN for supporting this publication.

Preface

The following collection of manuscripts emerged from an interdisciplinary virtual exchange held during the Winter semester of 2023/2024 at the Environmental Campus Birkenfeld, organized by Prof. Dr. Milena Valeva and Prof. Dr. Kathrin Nitschmann. Additionally, Prof. Dr. Héctor Bombiella Medina, a lecturer of anthropology in the Department of World Languages and Cultures at Iowa State University, contributed to the virtual exchange and supervised case studies 3 and 4, bringing his extensive experience in this field and facilitating the international exchange. Within the elective module on Human Rights, students from the Bachelor's programs "Nonprofit and NGO Management" and "Environmental and Business Law," as well as the Master's program "Energy and Corporate Law," explored the interconnections between human rights and sustainability.

In an era marked by unprecedented environmental challenges and profound social transformations, the intersection of human rights and the rights of nature has emerged as a critical area of inquiry and debate. Today, as we face the dual crises of climate change and biodiversity loss, the traditional boundaries between human and environmental rights are increasingly blurred. This confluence demands a fresh, interdisciplinary approach to understanding and addressing the complex and interrelated issues at hand.

Human rights, fundamental to the dignity and freedom of individuals, are deeply impacted by environmental degradation. Communities worldwide are experiencing firsthand the devastating effects of polluted air, contaminated water, and deforested landscapes, all of which undermine basic human rights to health, livelihood, and well-being. Conversely, recognizing the rights of nature – the intrinsic value of ecosystems and species – challenges us to reconsider our legal, ethical, and philosophical frameworks. It calls for a paradigm shift from an anthropocentric world-

view to one that embraces the interconnectedness of all life forms.

Engaging in robust discussions and research on these topics is essential in today's context. By exploring interdisciplinary perspectives, we can forge innovative solutions that honor both the rights of individuals and the integrity of nature. This special issue aims to contribute to this vital discourse, providing insights and fostering dialogue on how we can collectively navigate the complex landscape of human rights and environmental sustainability.

The first chapter „Human rights and SDGs in the context of democracy“ examines the significance of international human rights in today's context and links them to new value systems like sustainability.

The second chapter, the case study „Rights of Nature“ explores the concept of granting legal rights to nature itself by comparing laws from various countries to show how it combats environmental exploitation.

The third chapter, the case study „Traditional coca leaf consumption and drug trafficking in Colombia“ delves into the complex issues surrounding coca cultivation in Colombia, highlighting its economic, social, and political impacts.

The fourth chapter, the case study „The artisanal fishing community of Chorrillos, Peru“ aims to provide theoretical insights and recommendations for improving the livelihoods of artisanal fishing communities in Peru, considering legal, ethical, and environmental perspectives as well as how economic liberalization, privatization, and deregulation affect the community's socio-economic conditions.

4

Case study
**The artisanal fishing
community of
Chorrillos, Peru**

Introduction

In his doctoral thesis "Place-based communities and neoliberalism: A study of the artisanal fishing community of Chorrillos, Peru," Héctor Andrés Bombiella Medina examined the impact of neoliberal policies on local communities, specifically focusing on the artisanal fishing community in Chorrillos. He explored how economic liberalization, privatization, and deregulation affect the socio-economic conditions, environment, and social structure of this community. The study offers insights into the complex interplay between place-based communities and neoliberalism – a system characterized by a minimal state and self-regulated market, which has led to market failures, social polarization, and uneven development, with the state evading responsibility for the less privileged. As asymmetries and inequalities become more visible, local organizations have emerged to negotiate on behalf of communities. Additionally, urbanization further complicates this scenario, as rapid urban expansion exacerbates socio-economic disparities and environmental burdens, especially in developing nations such as Peru. The fishing community of Chorrillos faces pressure from Peru's elite, who view the port as a profitable space, perpetuating historical inequalities. Artisanal fishing, considered an occupation of the lower class, is plagued by poor infrastructure and living conditions. Artisanal fishermen struggle with poverty and social exclusion, with limited government support. Global issues such as overexploitation, inefficient regulations, and declining fish stocks affect artisanal fishing groups, highlighting broader concerns of poverty alleviation and food security. Labels for sustainable fishing, while well-intentioned, often benefit large industries and fail to support small-scale fishermen effectively. In Chorrillos, tensions arise over access to fishing grounds, with industrial and artisanal fishers vying for control. The community's definition of the environment goes beyond conservation, emphasizing its importance for daily sustenance and livelihoods. Finally yet

importantly, the anthropologist analyzed the dynamics between local identity, traditional practices, and the forces of global capitalism. The work shed light on the tensions and challenges faced by the community, and suggested possible ways for it to adapt to these changing conditions.

The three authors of the following student research papers were asked within the framework of the interdisciplinary elective "Human Rights" to engage with the case study "The artisanal fishing community of Chorrillos, Peru" and to shed light on the legal and ethical perspectives. Furthermore, they were asked to report strategies to collaborate with the artisanal fishers association, local authorities, international NGOs, and cooperation to address one of the fishers' challenges and to give recommendations for action to improve the livelihood of these local-based communities.

With her paper "Artisanal fisheries in circumstances with political framework and co-management" Dorothea Hensing discusses the high productivity of pelagic fish in the Humboldt Current Large Marine Ecosystem (HCLME) and how it is impacted by factors such as acidification and oxygen depletion due to global warming. This ecosystem, rich in marine life, faces significant challenges exacerbated by extreme weather events like El Niño and La Niña, profoundly impact the livelihoods of artisanal fishermen, creating economic instability. Despite these adversities, artisanal fisheries remain crucial contributors to Peru's GDP. However, their sustainability and financial stability are compromised by various factors, including the lack of institutional support and the prevalence of informal practices within the industry. Informality permeates aspects such as labor relations and vessel construction, consequently affecting workers' rights, their financial stability and rendering them vulnerable. Fishing communities, such as the one in Chorrillos, are complex socio-ecological systems reliant on social capital, but they are susceptible to external influences. Political dimensi-

ons further complicate the scenario, necessitating the establishment of effective co-management mechanisms, artisanal fisheries' inclusion in decision-making processes, a comprehensive understanding of ecosystem threats, and policy reforms to address informality. The author demonstrates the importance of strengthening governance and decision-making processes to address institutional flaws and protect the marine ecosystems and livelihoods of artisanal fishermen in Peru.

Climate change, though a global challenge, will not distribute its impacts uniformly across the world's population. Indigenous and local-based groups, such as the artisanal fishers of Chorrillos, are anticipated to be among the communities most profoundly affected by its consequences. While there is a growing body of literature related to traditional ecological knowledge (TEK) and climate change, it is not yet a mainstream consideration in sustainable development. In her paper "Traditional ecological knowledge – a key element of sustainable development" Nina Giordano highlights the vital role of this particular body of knowledge while human societies encounter unprecedented challenges such as pollution, overfishing, biodiversity loss, and deforestation. At the heart of the paper lies the recognition of TEK as more than just a repository of ancestral lore and beliefs; it is a living, dynamic system shaped by the collective experiences, observations and practices for sustainable use of generations past and present. The author addresses the issue of TEK, its protection and its interrelationship with western science as follows: First, the author deals with terminology and describes the six faces of faces of TEK. She then enumerates the various actors involved and addresses the importance of fostering collaboration and knowledge exchange between scientists and locals. As she delves deeper, she unravels the multifaceted roles and relevance of TEK in contemporary conservation efforts and natural resource management. In a further part, the paper discusses the protection and legal framework of TEK and how sound policy might provide the necessary framework for acknowledging, validating, and integrating TEK into decision-making processes and can promote a more inclusive and holistic approach to environmental management, conservation and sustainable development.

The paper by Yasmin Krami, "Strategy to promote the Human Right to an Adequate Standard of Living for Peruvian Artisanal Fishers according to Article 25 of the Universal Declaration of Human Rights", explores the living conditions of Peruvian artisanal fishers within the framework of the Universal Declaration of Human Rights. Its principal objective is to gain a comprehensive understanding of the current living standards of these fishers and to propose viable solutions for improvement, while taking into account environmental considerations and legal frameworks. At the core of this analysis lies the endeavor to ensure an adequate standard of living for fishermen in Peru, with a particular focus on Chorrillos. Despite the presence of protective mechanisms, persistent challenges such as social inequality continue to pose significant hurdles. The case study of Peruvian fishers in Chorrillos serves as a poignant illustration of a myriad of challenges spanning from working conditions to grappling with environmental disasters. Throughout the discourse, there is a resounding emphasis on the critical role of sustainable fishing practices in addressing these challenges, not only to mitigate environmental impact but also to foster a sense of environmental consciousness and social responsibility. Furthermore, a comparative analysis shedding light on the working conditions of fishermen in New Zealand, Iceland and Mexico reveals the diversity of approaches in regulatory frameworks.

To address the research question, the method applied aims to evaluate existing research literature and policy documents as well as synthesizing ideas and critically analyzing the status quo. Due to the impossibility to conduct field work, the presented student research papers are a strictly theoretical endeavor constructed solely on secondary sources. Therefore the findings might have already been filtered by another person's interpretation, standpoint and/or cultural mediation. In addressing the need for a more comprehensive and diversified foundation for our case study, we have endeavored to incorporate various viewpoints. This has involved gathering a broader spectrum of research data and insights from both Indigenous and non-Indigenous scholars and intellectuals. Our aim is to portray the case at hand with the utmost nuance and depth possible.

Artisanal fisheries in circumstances with political framework and comanagement

Author: Dorothea Hensing

Table of contents

1 The marine ecosystem of Peru	130
1.1 The Humboldt current large marine ecosystem	130
1.2 El Niño and La Niña.....	131
1.3 Marine heat waves.....	132
2 Economic aspects	132
2.1 Navigating challenges and opportunities for sustainable livelihoods and economic impact.....	132
2.2 Challenges of informality.....	133
2.3 A better price elasticity due to a management committee – a comparison between Peru and Chile.....	134
3 Social aspects	135
3.1 Types of capital.....	135
3.1.1 Financial capital.....	135
3.1.2 Human capital.....	136
3.1.3 Social capital.....	136
4 Political aspects	136
5 Management approach	137
5.1 ABFM's.....	138
5.2 IMTA.....	138
5.3 A transboundary issue.....	139
6 Summary	140

1 The marine ecosystem of Peru

The first chapter provides an overview of three main topics: the Humboldt Current Large Marine Ecosystem (HCLME), El Niño and La Niña phenomena, and marine heatwaves. It discusses the unique characteristics of the HCLME and its vulnerability to global warming-induced changes. Furthermore, it examines the impacts of El Niño and La Niña on weather patterns and fisheries in Peru, particularly affecting artisanal fishing communities.

Lastly, it explores the increasing frequency and intensity of marine heatwaves and their detrimental effects on ocean ecosystems, emphasizing the importance of understanding and addressing these issues for coastal regions in Peru.

1.1 The Humboldt current large marine ecosystem

The Peruvian coast is located at the Humboldt Current Large Marine Ecosystem (HCLME) and is

spreads more than two hundred nautical miles from the coast. Within the HCLME is the Humboldt Current System which makes up 65% of the HCLME. Significant is that the Humboldt Current System differs from comparable ecosystems like the eco-systems of California, the Canary Islands, Humboldt, and Benguela. Those differences include that the HCLME is the ecosystem closest to the equatorial line. There for it is most affected by ENSO (The equatorial Pacific is the source of the El Niño-Southern-Oscillation, which is the predominant type of interannual variability there. It has significant links to the other oceanic basins and has an impact on the environment and physical landscape of the Pacific basin. Oceanic and atmospheric teleconnections are responsible of this) (Baldenhofer, 2014). While, compared to the other four ecosystems, it has the high-est effectiveness in fishing stocks even though that the facts show that the primary effectiveness in fishing is equal to them. And lastly it is significant that the HCLME has a flat and intensive subsurficial minimum layer of oxygen which is combined with the oxygen-rich epipelagic habitat, compressed to a small area. In summary, this means, that the HCLME has an extraordinary pelagic fishproductivity which is mostly compact in the Peruvian buoyancy system (Dimitri et. al., 2016).

An assumption is that, triggered by global warming, the warming and matter-exchange between the atmosphere, ocean and continent will bring about change to pressure gradients, coastal and cross-costal wind fields, ocean currents, sea surface temperature (SST) and thermal stratification. Another fact is that the expansion of entering carbon dioxide into the ocean and large stratification will lead to acidification and oxygen depletion, triggering a cascade of biogeochemical and ecological changes in the marine ecosystem.

It is unclear how these stressors affect the productivity and biodiversity of the HCLME, and if the physical and biogeochemical alterations will affect the phenology, species compositions, and spatial distributions of primary and secondary producers. Globally it is prognosticated that without a change, the marine primary productivity will be declining, and the marine ecosystem will suffer loss, especially in the tropical, and polar regions (Dimitri et al., 2016). Therefore, morphological, sym-

biotic, and metabolic traits appear to be crucial adaptations required for larger organisms to be able to survive the many stress factors. However, this also deserves further research (ibid.).

1.2 El Niño and La Niña

Further ecological issues influenced by global warming are the effects El Niño and La Niña; The unusual weather on the west coast of South America, South Asia, and Australia, is due to El Niño and La Niña which bring heat, frost, hurricanes, and torrential rains. Droughts, enormous waves, floods, and landslides can be the results. Extreme weather occurrences are typically triggered by the El Niño weather phenomena. El Niño frequently causes destructive and severe effects such as heat waves, droughts, floods, hurricanes, low fish stocks, starvation, droughts, forest fires, and landslides. But El Niño can also cause the blooming of deserts, replenishing dried-up water reserves. Precise research has not yet been done on why the erratic weather phenomena El Niño causes in the southern hemisphere on the Pacific Ocean around Christmas time. The Pacific coasts of Ecuador, Peru, and Chile typically see a steady high-pressure area during this time of year, while the coast of South-East Asia experiences a low-pressure area. The cold winds travel northward toward the equator due to the area of high pressure off South America. Once there, the Coriolis force deflects the winds westward, creating a trade wind that blows from the southeast. The air gradually rises in temperature and collides with the low-pressure area off the Australian coast (Rundfunk, 2023). These anomalies have a major impact on Peru, especially for local fishermen, whether industrial or artisanal. The impact on Peru's artisanal fishermen is multifaceted. Economically and socially, phenomena such as El Niño and La Niña are drastically restrictive for them. Artisanal fishers are particular affected by these phenomena because their local communities depend on the ecosystem and the resources that it is providing. In this manner, climate variations like the anomalies have the potential power to impact whole socio-ecological systems, (SEs). A deeper comprehension of these dynamics on a management level and whether they are socially and ecologically-related, directly, or indirectly, could have a positive influence on the existential

basis of communities, specifically as it relates to marine resources (Kluger et. al., 2019).

1.3 Marine heat waves

An anomaly the Peruvian Coast and Ocean are also affected by marine heatwaves. Marine heatwaves are periodic extremely warm sea temperatures that can last for days or months. They can extend over more than 1000 kilometers and reach several hundreds of meters in depth. These heatwaves occur twice as often today as they did 35 years ago and, according to climate model predictions, will occur more frequently in the future.

Recurring weather phenomena such as El Niño appear to be an important factor in marine heatwaves. However, marine heatwaves have not been as well researched, either quantitatively or qualitatively, as heatwaves on land (Frölicher, 2019). The concentration of greenhouse gases in the atmosphere increases due to the heat stored in the earth system. Most of the heat is absorbed by the ocean, which contributes to rising sea levels. This is illustrated in figures: between 1987 and 2010, the ocean stored 93% of the heat. The remaining 7% was distributed on land, in the atmosphere and on ice. This makes the ocean the largest heat reservoir in our climate system, slowing down the warming of the atmosphere to a significant extent. However, this has the effect that the uppermost ocean layers are continuously warmed (ibid.).

Marine heatwaves are periodic extremely warm sea temperatures that can last for days or months. They can extend over more than 1000 kilometers and reach several hundreds of meters in depth. These heatwaves occur twice as often today as they did 35 years ago and, according to climate model predictions, will occur more frequently in the future.

The rising temperatures in the ocean increase the probability of both the frequency and the intensity of marine heat waves. This trend has already been observed. For example, in 1982 marine heatwaves occurred 1.5 times per year and in 2016 already five times per year.

The warming of the ocean negatively impacts organisms and ecosystems, and such deterioration can trigger further cascading effects, leading to the extinction of entire species and ecosystems (ibid.).

The following sections provide facts, examples, assumptions, and suggestions of what these independences means in concrete terms. Political cornerstones are the main pillars of many changes that need to be tackled to help artisanal fisheries prepare for subsequent El Niño phenomena and strengthen fishing communities, be it socio-ecologically, economically, politically, or in the manner of management. These anomalies are influencing coastal regions of Peru like Chorillos, Piurra, Sechura and many more.

2 Economic aspects

Peru's artisanal fisheries industry is vital for food security and economic prosperity, notably driven by the Jumbo Flying Squid (JFS) fishery along the northern coast. However, the sector faces informality, hindering its full potential despite significant contributions to GDP. Challenges including regulatory ambiguity and market vulnerabilities exacerbate poverty and vulnerability. A comparative study with Chile underscores the importance of formal co-management structures in enhancing economic efficiency and curbing illicit markets. Thus, institutional reform and proactive management are imperative to ensure sustainable livelihoods and economic resilience amidst ongoing challenges.

2.1 Navigating challenges and opportunities for sustainable livelihoods and economic impact

Artisanal fisheries are elementary for food security and the economy of Peru. In fact, they are aggregating nine to fifteen percent of the gross domestic product. Even during the COVID-19-pandemic in 2020 artisanal fishers could have been profitable (Jara et. al., 2020). Between 2010 and 2019 official data are showing that the JFS-fisheries (Jumbo flying Squid) account for 38% of all Peruvian land-

ings for direct consumption and that they make up 59% of all seafood exports for direct human consumption. Artisanal fishers are also worldwide the most affected by the weather anomalies (ibid.). But besides this fact artisanal fishers are not only confronted with weaknesses. Peru is one of the largest fishery-nations. More than eighty percent of the land catches are reprocessed for fish flour and fish oil and seafood sales are largely generated by artisanal fishermen. The artisanal fishers of Peru are predominantly settled on the northern coast, where one third of them are in the state of Piura (López de la Lama et. al., 2022). According to the data, land prices fell sharply as the quantity of land for Peruvian fisherman increased. Conversely, Chilean, and Peruvian fisherman and exporters maintained a high degree of price stability across nearly all supply levels. The research indicates that one of the main causes of Peruvian fishermen's varying price elasticity is the informal nature of JFS fishing in the country, which is devoid of co-management systems. Based on the findings, to benefit fishermen both financially and environmentally it is recommended that, the artisanal fleet currently in operation be granted secure exploitation rights as soon as possible and that co-operative management agreements be developed at a swift pace (Jara et. al., 2020).

2.2 Challenges of informality

Small scale fisheries are intrinsically complex, dynamic, and diverse. They face numerous multifaceted, and wicked challenges that result in poverty and general vulnerability. The interdependencies between poverty and vulnerability have many implications, but among them, the institutional dimensions have been found to be particularly important. Even though the Peruvian artisanal squid fleet is economically significant and contributes to income, food security, and export revenues, there are several risks associated with the lack of institutional support. A few policy concerns pertaining to the fishery hinder the industry from fully contributing to both the local and national economies. Small-scale fishermen in Peru are disproportionately affected by this informality, demonstrated by the fact that fifty percent of all small businesses, seventy percent of the economically active population, and one-fifth of the countries' GDP (Gross

Domestic Product) are reportedly involved in the informal economy (Gozzer-Wuest et. al., 2022).

A first problem with the policy is that, like most small-scale fisheries in the nation, the fishery is still de facto open to the public, which makes sustainable use difficult. Programs to legalize the active operational fleet through individual and collective legal regimes have been initiated by the government since 2016. These initiatives have yielded mixed results and have been sluggish. In addition, the coexistence of different tenure regimes exacerbated tensions within the sector and hindered the collective action needed to address fisheries related problems.

Second, many of the fishing vessels are still being built outside of the law, having been constructed in local artisanal shipyards with dubious legal standing.

Third, there is frequently an informal relationship between ship owners and fishermen, which results in the hiring of unskilled seafarers and the avoidance of social security, accident, and health benefits payments. Shocks like the COVID-19 pandemic have contributed to the vulnerability of workers, particularly those groups exposed to social exclusion such as migrant workers in the fishing industry.

Fourth, informality makes it more difficult for owners of vessels to get credit from formal lenders like banks, which forces them to rely on unofficial lenders.

Fifth, although fishing is done on the informal side, distribution to exporters and post harvesting happen inside the legal system, which may create power imbalances in negotiations.

Sixth, due to a lack of efficient organization and understanding of market mechanisms, fishermen frequently overfish the market. Periodic overfishing encourages the development of an illicit squid market for fishmeal and causes abrupt drops in squid prices, which lead to cyclical social tensions.

Seventh, a sizable number of exports are shipped to Europe, where actions taken to stop illicit, unreported, and unregulated (IUU) fishing may target Peruvian JFS fisheries. In this regard, the US International Trade Commission has recently voiced concerns. Communities that depend on fishing may suffer even more unfair effects from such measures (Gozzer-Wuest et. al., 2022).

Because of informality, government officials are unable to clearly see how JFS fisheries contribute to the nation's economy and the creation of jobs. Since a large portion of fishing activity is hidden from regulators, fishery has not received the level of government support that would be expected given its importance.

Similar situations have been reported for the Peruvian scallop fishery, where government structures, due to the informal nature of traditional local users, do not function effectively and making them invisible among official stakeholders (ibid.). Various authors have suggested that the entry of industrial companies into this fishery would bring economic benefits. This could, for example, mean an increase in state income resulting from the payment of fishing rights. The possible socio-economic impact of this measure should be considered, as market flooding could be exacerbated and sensitive communities along the Peruvian coast could be negatively affected. Also Contrary is that this measure would displace the historic artisanal businesses, which already receive too little attention from the authorities and institutions (ibid.). To preserve the culture of artisanal fishermen, alternative solutions should therefore be considered.

2.3 A better price elasticity due to a management committee – a comparison between Peru and Chile

The aim should be focused on the treatment of the artisanal fisheries and how they can successfully be incorporated into the formal economy. An already proven concept has been implemented in Chile, with respect to price mechanisms, food security and regulations, which could be tried to be implemented in Peru as well:

A factor examined by Gozzer-Wuest et. al. is the significant decline in prices paid to fishermen, despite increasing landings in Peru, specifically for the Peruvian squid fleet. Accordingly, prices in Peru dropped by sixty percent while Chilean and Peruvian exporters maintained consistent prices across all levels of supply. While Peruvian fishermen experienced a sixty percent price decline with rising landings, this decrease was only twenty percent for Chilean squid fleets. The following causes were identified; Lower yield of the Chilean fleet, growing demand in international mar-

kets, processors-exporters can store products for a longer period, differences in the logistics and infrastructure of processing facilities, and trade agreements concluded by the countries during the period studied.

Considering all these factors, the authors, however, operated on a different assumption, suggesting that differences in price elasticity between Peru and Chile are attributable to Peruvian fishermen having less negotiating power than Chilean counterparts. This is due to the consequences of institutional marginalization, such as widespread dependence on informal lenders or weak organizational capacity, which is essential for pursuing communal interest (Gozzer-Wuest et. al., 2022).

To confirm the cause-effect links between institutional marginalization and price elasticity, it was found that price declines due to market flooding was a problem and that Chilean fishermen met in the governmentled management committee before the introduction of the price. This management committee, set up by the fishing communities themselves, seems to be the key to the different price declines between Peruvian fishers and Chilean fishers. Consequently, this explanation seems plausible:

During the first stages of the committee's operation in 2015, discussions on prices were driven by the artisanal sector and became one of the main focal points of the discussions held in the committee. This issue was resolved through an agreement between the representatives of the industrial and artisanal sectors participating in the committee and prevented market flooding due to the industrial sector's race to fish. From then on, the industrial sector agreed to fish its allocated quota in eight months to avoid market glut.

This agreement was made possible by the institutional recognition of the fishing sector and the introduction and operation of the management committee (a formal co-management mechanism), where fishermen's representatives could voice their concerns and effectively participate in fisheries management decision-making. This case points to the economic importance of institutional recognition and suggests that the institutional marginalization of the Peruvian artisanal catch sector could prevent greater economic efficiency that could bring environmental benefits, prevent social

tensions, and even stop the continuous rise of illegal markets for the product (Gozzer-Wuest et. al., 2022).

The measurement of the present and future vulnerability and the development of adjustment strategies are rudimentary for their sustainability as well as for the livelihoods of many humans (Jara et. al., 2020).

3 Social aspects

Fishery-communities are complex socio-ecological systems. Social, cultural, ecological, and economical aspects are interconnected and mutually influence each other, forming a broad biophysical and human network.

These interactions are influencing the total resilience of the system. Decision processes, which are ignoring or misunderstand the biophysical or human dimensions of the system will be probably lead to inadequate governance agreements, unsustainable fishing practices, undermining rights and historic personal possessions, threat the ecosystem and health, and threaten the food security of coastal fishing communities (López de la Lama et. al., 2022).

The Autor's, Santiago de la Puente et. al., examined the wellbeing of small-scale fisher's, which is in literature are rarely researched and quantified. They evaluated the socio-economic performance and evolution of two small-scale fishing communities in Northern Peru using the Sustainable Livelihoods Approach (SLA). SLA is one of the most holistic frameworks for assessing the effectiveness of development policies and interventions aimed at improving wellbeing in fishing communities (ibid.). Quantitative indicators were used to characterize fishers' financial, human, natural, physical, and social capitals.

Identified was, that the two fishing communities (CB: Cabo Blanco, EN: El Ñuro) have low human and financial resources, strong social capital, and improvement in their physical capital resources and contemporary a simultaneous decline of their natural capital resources.

The results have also shown, that their target stocks and incomes are declining even though they are using selective slightly fishing methods. This indicates that such communities are highly sensitive of external environmental impacts, for

example El Niño, economic impacts like market accesses, and poorly governance (López de la Lama et. al., 2022).

3.1 Types of capital

This chapter will have a closer look into the financial capital, the human capital, and the social capital because, natural capital was already illuminated at the beginning. Physical capital also is not discussed in more detail here, as it is of no further significance for the analysis. Notable is that the types of capital are related to the vulnerability of the artisanal fishery community, which were researched in the following chapters. Remarkable is that vulnerability is a cause-effect-relationship that affect all fishing communities nationally, some stronger than others.

3.1.1 Financial capital

Most small-scale fisheries were impoverished. While the monthly minimum wage in Peru was PEN 850 (≈ USD 265) in 2017, 67% of fishermen in CB and 65% in EN reported monthly earnings below or equal to PEN 500 (≈ USD 156). In these communities, the proportion of fishermen who earn more than PEN 1000 (≈USD 311) per month is quite low (CB 12%, EN 3%). This is much less than the national average; for instance, 31% of Peruvian small-scale fishermen made less than PEN 500 per month in 2015, while 30% made more than PEN 1000.

A significant portion of the surveyed population was unable to secure their monthly income through fishing throughout the entire year (CB: 44%, EN: 62%). Alternative sources of income are rare in these areas, and only a few fishermen (CB: 24%, EN: 31%) can supplement their income through tourism, trade, or construction. Nevertheless, 60% of the surveyed fishermen (in both communities) stated that they are the sole sources of income for their households. But meanwhile the access to credit has improved, which is widespread in this communities; In CB 69% of small-scale fishermen have obtained loans from microfinance institutions or banks. In EN, this percentage account to 87%. This represents a significant increase compared to data from 2012 (at that time, for example, 50% of fishermen in CB and 63% in EN had access to loans) (ibid.).

3.1.2 Human Capital

Educational levels were similar in both communities. Most fishermen had only completed elementary school (61%) or secondary school (19%) and only 2% had obtained degrees from institutions of higher education. The remaining (18%) fishermen had not completed elementary school. Related to that, nearly half of Peruvian small-scale fishers have six to twenty years of experience and in the researched areas CB and EN, fishers averaged started working at the age of fourteen.

These results present a lack of education and without the basics of education, fishery-communities are highly vulnerable. (López de la Lama et. al., 2022).

3.1.3 Social Capital

A development has taken place in Peru, even if it just counts for the two researched areas CB, and EN, this can be seen as a positive development;

Over 75% of the surveyed fishermen belonged to local fishing guilds (OSPAs, abbreviated). OSPAs, like unions, aim to improve fishermen's pay and strengthen their rights. Fishermen from EN and CB are better organized than the average small-scale fishermen in Piura or Peru (OSPA membership: 48% and 54%, respectively). Furthermore, most organized fishermen reported regularly attending OSPA meetings and found that OSPA membership provided them with a direct benefit.

The most common benefits included: (1) improved ability to market their catch; (2) better access to formalization pathways, such as obtaining a fishing permit; (3) the presence of a safety net, e.g., a network of colleagues who can help in times of need; and (4) improved access to information. Fishermen mentioned that they trust the members of their OSPA and would collaborate in mutual interest.

As a result, from interviewed fisher and local leaders, identified were a view differences between CB and EN. In contrast to CB EN is a highly organized and united fishing community that prides itself on using highly selective, traditional fishing methods with a low ecological impact. CB is also a united fishing community, even though there are known internal conflicts (e.g. net sinkers versus hand liners) that limit cooperation between fishermen. Perhaps a crucial difference between

the two communities is that fishermen in EN regularly implement self-management mechanisms based on traditional knowledge (ibid).

As mentioned in the introduction, the forms of capital are influencing each other and show synergetic effects. The wellbeing of the fishers is enabled through policy, which support marine ecosystems. Likewise, would an improvement of the livelihoods also improve the marine ecosystem. This valuation could support policymaker during a reconstruction of sustainable developments like improved social, economic and ecological goals. Relying on that, policymakers could also aim to improve the trust and long-term sustainable developments, which may seem challenging short-term or high in costs, but in long run strengthening adaptabilities. The SLA could be a point of reference for improving customization capabilities.

Social capital was highest within the CB and EN communities. However, negative effects also influence each other negatively, so that a negative factor also weakens other capital resources.

Fishermen do not have the power to contain external fishing pressure or negotiate prices. If this hardship worsens, social capital would decrease as rivalries between fishermen would intensify and trust among fishermen may decrease. Low levels of education, which implies a low level of knowledge including their limited access to information, and the lack of alternative sources of income also make these communities more vulnerable (López de la Lama et. al., 2022).

4 Political Aspects

This paper underlines several circumstances, with which the artisanal fisheries are confronted in combination with the lack of institutional interests, actions, and assertiveness. The following current political grievances have been identified:

a) To improve the resilience of the HCLME to increasing climate pressures, clearer governance, and management of the ecosystem services of the HCLME is needed, especially because fish production is of high importance to the country's economy and society. The main threats to biodiversity are overfishing, pollution and coastal development, which reduce biodiversity in the HCLME by 65%- 75%. As a result, in the southern area of the HCLME, six fisheries have collapsed, eight are

Fishermen do not have the power to contain external fishing pressure or negotiate prices. If this hardship worsens, social capital would decrease as rivalries between fishermen would intensify and trust among fishermen may decrease. Low levels of education, which implies a low level of knowledge and the lack of alternative sources of income also make these communities more vulnerable

overfished and another eight are fully biologically exploited, and in the entire HCS (Humboldt Current System) area, fisheries have no management approach, biological reference points, or quotas.

b) Often artisanal fisheries have been not included in decision and research processes. Negative results from that are inefficient instructions, sensitivities for environmental insecurities, social traps, and market instabilities. Thus, situations are not uncirculated in developing countries such as they are in Latin America (ibid.).

c) To safeguard the transportation of goods and services out of the HCLME-area, it is important to understand the main threats to this LME, both natural and anthropogenic, as well as the annual gross domestic product of the regions. The wide variations in value reflect factors: (1) the absence of an established, standardized method for evaluating LME providers and services; (2) The varying importance of the range of economic activities in the various LMEs; and (3) the lack of data regarding important activities in some countries, such as coastal tourism (Dimitri et. al., 2016).

d) Informality in the Peruvian fleet has clear causes. According to the Peruvian National Center for Strategic Planning (CEPLAN), informality is a result of corruption, lack of transparency, low

government allocations to families, low investment in research and development, overregulation and the low average formal education duration of the population. A formal goal of clear government guidance would be of great value for artisanal fisheries.

e) Social Sciences identified institutional weakness as the cause of vulnerability of artisanal fishers. Problems like dept traps, which spring from dependence of informal financiers, and as a cause are identified as an environmental impact, negative effects at the level of bio-ecological perspective should be more closely considered for a better institutional integration in governance- and decision findings.

f) Regional experiences in Chile have shown that the implementation of comanagement solutions in small-scale fisheries is advantageous. It has become evident that fishermen have gained the ability to connect knowledge at the local level to shape decision making processes at the national level. This presents an opportunity to address many issues more effectively through active participation in management at the administrative level.

Unlike Chile, the Republic of Peru still needs to establish the political framework and create the necessary conditions to allow for the establishment of participatory comanagement mechanisms and institutions in the JFS fishery and elsewhere. Effective co-management institutions are the product of well defined elements like leadership, cooperation and necessary conditions like legally granted secure usage rights by government authorities. However, these institutions effectively can be compromised by subpar institutional procedures and corruption, some of the main reasons given by CEPLAN for Peru's informal economy (Gozzer-Wuest, 2022).

5 Management approach

As in the caption "Political Aspects" shown, many political issues are related to management approaches, which should had taken place, or at least are urgent to take place. In Chorrillos and elsewhere in Peru. The following parts present some rudiments, which related to the artisanal fisheries of Peru, are possible to implement and adopt.

5.1 ABFM's

Area-based Fisheries Management Measures (ABFM's) are conservation and/or fisheries policies that are spatially defined and formally established with the goal of achieving one or more desired fisheries outcomes. Many modern fisheries management plans and regulations use ABFM's, and their results are usually linked to resource sustainability. States should put management measures in place to stop overfishing and make sure that fishing effort is in line with ecosystems' sustainable use and productive capacity, as per the FAO Code of Conduct for Responsible Fisheries. When the conservation benefits produced are in line with their stated and intended primary or secondary objectives, ABFM's support primary or secondary conservation outcomes. ABFM's support complementary conservation when management actions are specifically designed to support the sustainable harvest of the target species while also successfully easing pressure on ecosystem function and biodiversity (Petza et. al., 2023).

There are three main types of restrictions on ABFM's: time (areas permanently or temporarily closed to fishing activities), space (closure of all or part of a fishing area or Exclusive Economic Zone) and type of fishing activity (restrictions may apply to all fishing activities in an area or to specific gear or socio-economic categories).

Many ABFM's may arise due to the different combinations of the three options and the degree of restrictions. While the ratification of international fisheries agreements and harvest control rules have also contributed significantly to the reduction of overfishing and rebuilding biomass, fisheries management measures, in particular rebuilding plans, have had particularly strong effects on reversing overfishing (ibid.).

The implementation of ABFM's would be an easy and effective method to immediately secure the marine ecosystem and support the recovery of Biomass, as well as for all marine organism, who are affected by the fishing activities.

5.2 IMTA

The growing demand for fish, combined with global population growth, makes efficient and sustainable aquaculture highly relevant to ensure global food security (Loayza-Aguilar et.al., 2023).

Based on global trends, the development of industrial mariculture on the coasts of Peru will continue to increase, which is primarily characterized by monospecific. This has an impact on ecosystems, as organic matter can degrade the benthic system, promoting eutrophication, which will have negative consequences for biodiversity and fishery resources. This could lead to unsustainable practices in the long-term.

The current contradiction in aquaculture is that, although aquaculture farms depend on the environment and the performance of ecosystems, the management of these systems is mainly determined by monocultures, which damages and destroys the ecosystem and the environment, as is the case in Peru.

It is therefore necessary to apply methods that can ensure both the protection of natural capital and profitability. Monoculture practices cannot reconcile this, whereas integrated and sustainable practices are desirable and necessary to keep aquaculture healthy and bio diverse. A concept of the Ecosystem Approach to Aquaculture (EAA) has already been derived from this problem. This concept aims to coordinate sustainable development, equity, resilience of interrelated socio-ecological systems and to implement these activities in a broader ecosystem. Building on the EAA, there is a trend to implement so-called IMTA.

From this perspective, it is important to implement new production models in fisheries that are based on sustainable practices, such as Integrated Multi-Tropical Aquaculture (IMTA). This combines greater efficiency, competitiveness, and profitability with ecological balance. IMTA represents the integration of four types of aquacultures: feed, in the form of fish, organic extraction (filter-feeding and suspension-feeding invertebrates), in-organic extraction (macroalgae) and sediment extraction such as suspension-feeding and sediment-feeding invertebrates. For this integration, it is important to harmonize the relationship between the species and their specific functional roles and the abiotic conditions of the ecosystem. The aim of this strategy is to utilize the advantages of the different tropical levels, to diversify activities and thus to combine sustainability with economic profitability. A positive side effect could also be the improvement of the image of the aquaculture sector.

IMTA has already been successfully applied in Dalian (China) and Canada (Loayza-Aguilar et. al., 2023).

5.3 A transboundary issue

A Transboundary Diagnostic Analysis (TDA) and a Strategic Action Program (SAP) for the GEF-UNDP Humboldt Project have been developed because of the cooperative efforts between Chile and Peru, as well as their respective fisheries research institutions, IFOP (The Fisheries Development Institute) and IMARPE (The Institute of the Sea of Peru). These efforts have been backed by national protected areas authorities and environmental ministries. Through a thorough analysis of transboundary issues and the development of focused strategies, these initiatives seek to address the urgent concerns affecting the Humboldt Current System's (HCS) health. The findings from the TDA and SAP are summarized in this translated text, emphasizing the primary issues found, their socio-economic and environmental ramifications, and the suggested solutions. The focus areas highlight the need for collaborative management approaches to protect marine ecosystems and advance sustainable development in the region. These include the suboptimal use of fishery resources and anthropogenic disturbances to marine habitats.

To create a Transboundary Diagnostic Analysis (TDA) and a Strategic Action Program (SAP) for the GEFUNDP Humboldt Project, Chile and Peru, along with their respective fisheries research institutions, IFOP (The Fisheries Development Institute) and IMARPE (The Institute of the Sea of Peru), have worked with the authorities for national protected areas and environmental ministers.

The SAP described several goals and steps to address the issues found in the system, while the TDA listed the primary concerns affecting the Humboldt Current System's (HCS) health.

The TDA's main objectives were to identify transboundary problems (TPs), characterize, assess, and evaluate their socioeconomic and environmental effects, as well as ascertain their root causes. Anthropogenic disturbance of marine habitats (TP2) and suboptimal use of fishery resources (TP1) were the two main issues found.

Weak governance, inadequate or nonexistent monitoring, control, and surveillance (MCS) sys-

tems, a lack of democratic processes in resource management and decision-making, and unfavorable incentives that promote prolonged participation in the industry with increased overfishing are the main causes of TP1. The misuse of fishery resources has the following negative effects on the environment: a) a reduction in biomass and population structure; b) a modification of trophic relationships in ecosystems; and c) a modification of biodiversity, environment, and ecosystem resilience.

For TP1, the following socioeconomic effects were noted: A decline in net income and job prospects; B a reduction in the availability of fisheries resources for food security.

Regarding TP2, various forms of land and marine pollution, such as organic matter, hydrocarbons, heavy metals, microbiological compounds, and solid and liquid chemical waste, have an impact on the environmental conditions of the HCLME. These pollutants have social and economic effects on human and ecosystem health, as well as affecting productivity in coastal areas. Therefore, the decrease in fish biomass and HCLME productivity is also a result of this transboundary issue. For TP2, the ensuing environmental effects were noted: Increased mortality in the early life stages of biological resources; a) deterioration of water quality and marine sediments; b) mortality of marine animals; c) alteration of biodiversity and reduction of ecosystem resilience; d) high amounts of unintended catch (bycatch and discards).

The following socioeconomic effects were also noted: a) losses in the economy, employment, and competitiveness; b) a decrease in the food security of marine products. Moreover, as previously mentioned, the HCLME's natural climate variability – such as ENSO – as well as climate-related manifestations affect productivity and bring about changes across all trophic levels (Dimitri et. al., 2016).

To successfully implement these complex and varied issues, it is very important to mention, that building translocal management initiatives is a crucial element in developing long-term adaptation measures that should be subsequently implemented by local and national government agencies in order to resilience to environmental change (Kluger et. al., 2019).

6 Summary

Pelagic fish productivity in the HCLME is exceptionally high, particularly in the Peruvian buoyancy system. Marine ecosystems are predicted to be impacted by acidification and oxygen depletion brought on by changes in atmospheric, oceanic, and continental interactions brought on by global warming.

Peru is impacted by extreme weather events caused by El Niño and La Niña, which are linked to global warming and occur on South America's west coast. These occurrences affect communities and the economy, especially artisanal fishermen whose livelihoods are disrupted.

Although artisanal fisheries face difficulties, they make a substantial contribution to Peru's GDP. A lack of institutional support, price fluctuations, and informality all affect the financial stability of artisanal fishermen. Artisanal fisheries are essential for food security despite their difficulties. Based on a price elasticity analysis, it is evident that institutional recognition and management committees are important factors in both countries. Overfishing and price fluctuations are caused by Peru's lack of institutional support, whereas Chile's management committee works to keep prices steady.

Political issues include the need for co-management mechanisms to be established, artisanal fisheries to be included in decision-making, threats to the ecosystem to be understood, and policy changes to be made to address informality. The susceptibility of Peruvian artisanal fishermen is a result of institutional flaws that necessitate strengthening governance and decision-making processes.

Unsustainable use, a lack of legal recognition, and poor management are some of the issues associated with Peru's small-scale fishing industry's informality. Informal labor relations and illegal vessel construction are examples of informal practices that impact workers' rights and vulnerability in times of crisis such as the COVID-19 pandemic.

With intertwined social, cultural, ecological, and economic facets, fishing communities are intricate socio-ecological systems. Social capital is essential to these communities' resilience and is impacted by elements like trust and organizational strength. Evaluations of wellbeing show how susceptible small-scale fishing communities are to outside influences.

Political issues include the need for co-management mechanisms to be established, artisanal fisheries to be included in decision-making, threats to the ecosystem to be understood, and policy changes to be made to address informality. The susceptibility of Peruvian artisanal fishermen is a result of institutional flaws that necessitate strengthening governance and decision-making processes.

The intricate interplay among ecological, economic, social, and political factors highlights the difficulty in maintaining Peru's marine ecosystems and the artisanal fishermen's livelihoods.

Furthermore, it should be emphasized, once again that management systems for Peruvian artisanal fisheries are key factor in actively shaping their conditions today and in the future. Which management approach suit which local communities would have been determined in further work. However, every artisanal fishing community should have at least one crisis management system in place to address environmental impacts such as ENSO, ocean acidification, marine heatwaves, and the current and future effects of overfishing. It would also be an easy, cheap, and effective way to identify and set ABFMs to prevent, or at least reduce, further ecological damage. Furthermore, the OSPA in Peru has shown positive changes for artisanal fishers and that this does not require financial capital, or a low budget to establish such "unions" locally and trans-locally. Therefore, artisanal fishers should be encouraged to get organized and work together on improvements, problems, disagreements, etc. and together de-

mand a higher level of commitment, respect, visibility, and integration from the government and authorities.

Without this, all management approaches and improvement potentials may be valuable theoretical approaches, but they cannot be implemented without active action and stronger collective commitment, as the government and authorities will remain "lazy" and the potential for shaping the country will remain untapped by artisanal fisheries.



Dorothea Hensing

is studying Nonprofit and NGO Management (B.A.) in the 5th semester at the Environmental Campus Birkenfeld, Trier University of Applied Science. Before starting her studies, she volunteered in Nepal. This voluntary service inspired her to start a bachelor degree dedicated to third sector organizations. Especially in times, when inequalities and extremes are increasing, both nationally and internationally, she sees the potential of NGOs and the civil society.

Traditional ecological knowledge – a key element of sustainable development

Author: Nina Giordano

Table of contents

1 Introduction	142
2 Traditional ecological knowledge	143
2.1 Local, indigenous and traditional ecological knowledge	143
2.2 The six faces of TEK.....	143
2.3 Actors of TEK.....	145
2.4 Relation between TEK and Western science	146
3 Roles and relevance of TEK in natural resource management and marine conservation	146
4 TEK in policy and law	148
4.1 Protection and legal framework	148
4.2 Sound policymaking.....	149
5 Conclusion	150

1 Introduction

Over forty years ago, physicist and deep ecologist Capra indicated: *"Ecosystems sustain themselves in a dynamic balance based on cycles and fluctuations, which are nonlinear processes. Linear enterprises, such as indefinite economic and technological growth will necessarily interfere with the natural balance and, sooner or later, will cause severe damage. Ecological awareness, then, will arise only when we combine our rational knowledge with an intuition for the nonlinear nature of our environment. Such intuitive wisdom is characteristic of traditional, non-literate cultures, [...] in which life was organized around a highly refined awareness of environment."* (1982, p. 41) Since then, natural ecosystems are being pushed beyond their limits with human societies confronting unprecedented challenges like climate change, species extinctions and pollution. Various approaches like ecological restoration, conservation, renewable energies and carbon

sequestration have been deployed to tackle the global ecological crisis. Yet, a crucial element remains largely overlooked: integrating local and traditional ecological knowledge as well as indigenous perspectives with modern western science to foster environmentally sustainable solutions. (Hoagland, 2016)

This student research paper explores how the concept of traditional ecological knowledge is defined in science, law and policy literatures and what contribution place-based communities such as the artisanal fishery of Chorrillos can serve for improving cooperative environmental and natural resources management. The method applied aims to evaluate existing literature, synthesizing ideas, and critically analyzing the status quo. Subsequently, the paper will provide recommendations for integrating ecological traditional knowledge in legal frameworks and practice through sound policy aimed at sustainable development.

2 Traditional ecological knowledge

Traditional ecological knowledge (TEK) refers to accumulated expertise, practices, and ideas held by indigenous as well as local communities, received, preserved, and transmitted orally from one generation to another (Casi et. al., 2021). Berkes, an applied ecologist has defined it as "a cumulative body of knowledge, practice, and beliefs, evolving by adaptive processes and handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment". (2012, p. 7) Even though there is no precise definition, it's widely accepted that the term "traditional" doesn't exclusively denote something relegated to the past. Instead, it pertains to collected wisdom over a long duration, constantly changing and being up-dated. Furthermore, TEK transcends mere descriptive literature and defies categorization into distinct disciplines like biology, geography, or chemistry (Casi et. al., 2021).

2.1 Local, indigenous and traditional ecological knowledge

Ethnoecology, as a subfield within ethnology and closely related to ethnobiology, is a field of study that focuses on the ways in which different human cultures and indigenous peoples perceive, interact with, and manage their environments. It involves the examination of how various societies understand and utilize their natural surroundings, including their knowledge of plants, animals, ecosystems, and environmental processes (Putra, 2021). Within the realm of ethnoscience, three terms – local ecological knowledge (LEK), traditional ecological knowledge (TEK), and indigenous knowledge (IK) – are often used, each capturing distinct facets of the dynamic connections between long-standing traditions and practices of certain regional, indigenous, or local communities.

LEK refers to the knowledge about local ecosystems, held by a specific group of people such as fishers and farmers regarding their local environment. It encompasses insights into the behaviors and development of animals, plants and habitats, often accumulated through direct and prolonged interaction. It is context-specific, drawing on the experiences and observations of individuals within a particular locale.

Within the realm of ethnoscience, three terms – local ecological knowledge (LEK), traditional ecological knowledge (TEK), and indigenous knowledge (IK) – are often used, each capturing distinct facets of the dynamic connections between long-standing traditions and practices of certain regional, indigenous, or local communities.

TEK broadens the scope to include knowledge which was passed down through multiple generations, living in close contact with nature, It embodies the wisdom, practices and beliefs concerning the environment that have been transmitted orally or through cultural traditions. TEK reflects a long-term, collective understanding of ecological dynamics and is deeply intertwined with cultural identity (Fischer et. al., 2015).

Indigenous Knowledge (IK) is often considered a subset of TEK. However, while TEK may include knowledge from various cultural groups, IK specifically focuses on the unique perspectives and practices of indigenous people. It encompasses not only practical insights into natural resources but also incorporates spiritual, cultural, and social dimensions. It emphasizes the reciprocal relationship between humans and nature, recognizing the interconnectedness of all living beings (The World Bank, 1998).

2.2 The six faces of TEK

Over the years, several authors have tried to identify and contrast the environmental knowledge held by aboriginal, native and indigenous people with the knowledge system employed by colonizer. Some have categorized knowledge elements into groups that collectively constitute the TEK of a community. For instance, Houde (2007) envisaged six interconnected and mutually evaluative

"faces" of TEK (Figure 8), to delineate areas of similarity and differences with Western science (WS). (Das et. al., 2023) He visualized TEK as a pentagon anchored by its cosmological foundation, which gives meaning to the knowledge system. The first three faces at the bottom are typically more readily grasped by non-Natives and valid in a non-TEK context. The remaining three faces, which involve ethics and values, cultural identity, and cosmology, are particularly aligned with TEK and potentially bear fundamental differences from the mainstream values that are encoded in western institutions. (Houde, 2007)

The most recognized manifestation of TEK is specific and factual observations, synthesized information as well as empirical understanding of natural phenomena. This includes detailed data on various aspects of the environment, such as ecological patterns, seasonal cycles, animal behavior and the abundance of wildlife. This face entails not only passive observation but also active participation, where community members intimately interact with their surroundings through subsistence activities such as hunting, fishing, farming, and gathering. It also involves comprehending the interrelationships between species, the connections within the biophysical environment, and the spatial distributions and historical trends of population patterns. TEK holders possess a nuanced

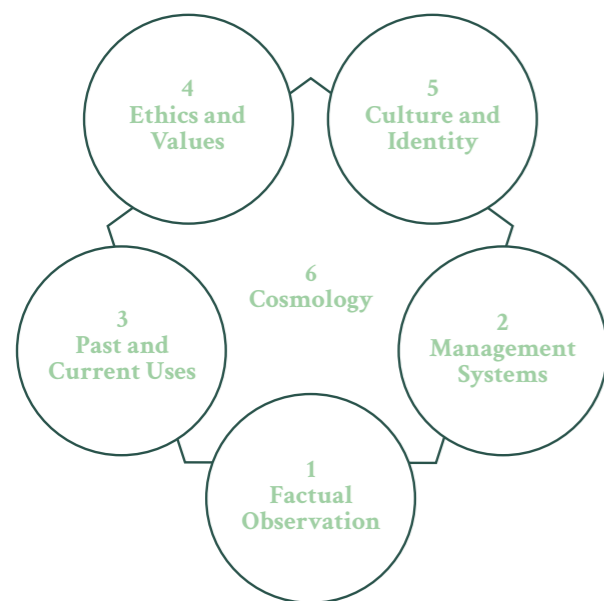


Figure 8: The six faces of TEK (Houde, 2007, p. 5)

understanding of ecological interplay, discerning subtle cues and indicators that inform decision-making regarding use of resources, agricultural practices and ritual ceremonies (Houde, 2007). This face aligns closely with resource management approaches and proves highly valuable in environmental impact assessments, risk evaluations and managing vulnerable resources. (Das et. al., 2023)

According to Houde, TEK largely serves the purpose of subsistence. Therefore, a prominent focus in TEK research revolves around resource management systems and its alignment with local environments. Consequently, the second face pertains to the methodologies aimed at fostering the sustainable utilization of local natural resources. This includes practices such as pest control, conservation techniques, diverse cropping patterns and mechanisms for assessing resource status. TEK-based management systems typically incorporate a holistic understanding, considering not only the ecological aspects but also the social, cultural, and spiritual dimensions of resource use. These management systems often employ a combination of traditional practices, customary laws, and community governance structures to regulate resource use. For instance, mechanisms such as seasonal harvest restrictions, rotational farming techniques and community-based monitoring programs. Furthermore, native communities actively engage in collaborative research and conservation partnerships, integrating traditional and scientific knowledge systems to enhance the effectiveness of conservation efforts (Houde, 2007).

The third dimension acknowledges the time facet of TEK. It reflects knowledge of the past and current uses of the environment. Firstly, it includes insights into historical land-use practices, such as traditional farming methods, hunting techniques and fishing practices. And secondly, it incorporates cultural heritage, encompassing oral traditions and historical narratives. These narratives also reinforce cultural identity and give a sense of family and community. This face underscores the dynamic relationship between indigenous peoples and their environments, advocating for the recognition and respect of traditional knowledge in modern conservation and resource management efforts. It is often revealed by First Nations in the context of

land claims' negotiations (Houde, 2007). Unfortunately, significant limitations of this aspect arise from potential misinterpretation resulting from limited control over information derived from oral history and uneven distribution of benefits stemming from the knowledge (Das et. al., 2023).

The fourth manifest relates to value statements about "how things should be" and encompasses the ethical principles and cultural values that guide indigenous communities' interactions with mother nature. This aspect emphasizes the intrinsic connection between human well-being, environmental ethics and spiritual harmony. Traditional cultures often emphasize values such as respect for all life forms and collective responsibility for maintaining ecological balance. This holistic worldview challenges anthropocentric notions of resource exploitation and advocates sustainable practices. Incorporating ethics and values into resource management requires recognizing and respecting diverse cultural perspectives and incorporating Native governance structures and decision-making processes. It involves fostering dialogue, collaboration, and mutual learning between local communities and state institutions to develop inclusive and equitable policies that honor both traditional wisdom and modern scientific knowledge. However, these values may not always align with the dominant discourse. Furthermore, it can be said that this face of TEK is currently not well implemented in state resource management (Houde, 2007).

The fifth aspect recognizes the importance of language and images of ancient cultures that serve as vectors for cultural identity. It has been argued that the essence of Native cultures resides in the land, and if the land undergoes significant transformation or loss, cultures and communities may similarly vanish. Land serves as repository of stories as well as heritage, therefore safeguarding these sites is essential for the enduring preservation of Native culture (Houde, 2007). Through TEK, communities maintain a profound connection to their ancestral lands, fostering a sense of belonging and continuity across generations. The preservation and revitalization of TEK contribute to the revitalization of indigenous cultures and the assertion of indigenous rights to self-determination and sovereignty. (Das et. al., 2023)

The final identifiable dimension of TEK is a culturally rooted cosmology, which serves as the foundation of all the other faces and is inherently intertwined with them. It is considered more of philosophy than an ideology and delves into the spiritual and metaphysical dimensions of indigenous understanding (interpretation or representation) of the environment. The cosmology elucidates the interconnectedness between humans, nature and the cosmos, shaping belief systems, rituals and practices that govern human-nature relationships. Many anthropologists have delved into this dimension of TEK, aiming to understand how Native people understand human-nonhuman animal relationships and how these perceptions directly impact social dynamics, obligations towards fellow community members and resource management practices. By recognizing and respecting indigenous cosmologies, we can deepen our understanding of human-environment relationships and cultivate more holistic approaches to conservation and stewardship (Houde, 2007).

2.3 Actors of TEK

TEK encompasses a diverse array of actors, each playing a unique role in the preservation, transmission and development of this body of knowledge. It is important to note that the actors involved vary significantly based on cultural and regional contexts. In general, however, the following internal actors can be captured. Indigenous and local communities, often the primary holders and practitioners of TEK, accumulate wisdom through generations of living closely connected to their natural surroundings. In particular, elders and traditional leaders often play a crucial role in passing down TEK. Shamans, healers and spiritual leaders are repositories of wisdom and experience and hold knowledge about the spiritual connections between humans and the environment. Furthermore, community members actively engage in traditional practices related to agriculture, hunting, fishing and herbal medicine, and therefore contribute to the development and continuity of TEK. Artisans and craftsmen, through their traditional crafts, possess knowledge about sustainable resource use and material selection.

Outside the communities, storytellers and historians support the transmission of important in-

formation about ecological processes and the relationships between humans and nature. External researchers and scholars help to preserve TEK by collaborating with indigenous and local communities to document, understand and validate the traditions (Houde, 2007). The cooperation between scientific researchers and TEK holders is essential for developing effective strategies for sustainable resource management. Integrating both scientific and traditional perspectives can lead to more comprehensive and culturally sensitive approaches to environmental issues (Berkes, 2007). Additionally, some government and policy agencies as well as non-governmental organizations work with communities to integrate TEK into conservation and biodiversity protection initiatives. It is particularly important to convince stakeholders in the economic and political sector, including local authorities and policymakers of the benefits of TEK and its influence on environmental protection, by integrating and turning them into ambassadors.

2.4 Relation between TEK and Western science

While the significance of TEK has gained recognition on the global stage and publications on the subject have surged, the relationship between WS and traditional knowledge remains controversial (Berkes, 2007). They represent two distinct but interrelated approaches to understanding the natural world. WS, rooted in empirical observation, experimentation, and theoretical frameworks, has its origins in the Enlightenment era and has since become the dominant paradigm globally. It follows the steps of developing hypothesis, testing hypothesis, analyzing results and defining conclusions. Furthermore, it emphasizes objectivity, quantifiability and the use of specialized methodologies to study and explain natural phenomena.

In contrast, TEK is derived from the accumulated wisdom, practices, and beliefs of Native communities and is often an integral part of a culture (Hoagland, 2016). Although there are many differences between the two knowledge systems, there are similarities that should not be overlooked. Both are founded on the principles of observation and the formulation of concepts derived from these observations. At the same time, findings are constantly verified through repetition and verification, inference and recognition of pattern events.

Additionally, many of the guiding principles established by ancestral resource managers align with rules derived from ecological science (Das et. al., 2023). Even though TEK is often perceived in conventional WS as lacking a quantitative, systematic approach to measurement, not all researchers are opposed to it. Botanists were among the first scientists to show an interest in TEK during the 18th century. It largely remained within their domain throughout the nineteenth and twentieth centuries. However, the 1990s witnessed a revitalized and heightened interest in TEK. Nowadays, it has become a highly-valued source of information as part of numerous research disciplines such as ecology, archaeology, medicine, agronomy and climatology. At the same time, various actors recognized that a successful approach must be multidisciplinary, incorporating the participation of local communities by bringing in Natives as collaborators in scientific projects and conservation efforts (Royer, 2016). Experts in WS are increasingly acknowledging that TEK can offer insights that are absent in current research and by combining the two forms of knowledge, capable of enhancing each other's strengths through multidisciplinary approaches for mutual benefit (Hoagland, 2016). And last but not least, blending WS and TEK offers a comprehensive approach, potentially serving as the foundation for addressing our most intricate environmental challenges. Neglecting either one would make the environmental issues worse. Put plainly, science devoid of wisdom lacks conscience (Hoagland, 2016).

3 Roles and relevance of TEK in natural resource management and marine conservation

Since the economic globalization has progressed, there has been a notable trend towards the homogenization of knowledge and practices related to the utilization of natural resources. Standardized approaches to resource management and exploitation have become more prevalent, often prioritizing efficiency and profit over the preservation of biodiversity and cultural heritage. Furthermore, resource managers and state officials often view knowledge, not generated by Western-trained scientists, as secondary or unreliable (Arico and Valderrama, 2010).

Over time, especially since the widespread acceptance of "sustainable development" concepts at the Rio Summit in 1992, development paradigms have transitioned from a narrow, segmented view to a broader, holistic approach emphasizing the promotion of "knowledge dialogues" among diverse knowledge systems (Arico and Valderrama, 2010). This has resulted in an increased awareness of the crucial role that TEK plays in sustainable development (Naureen, 2020). For generations, traditional communities have actively managed ecosystems to ensure survival and well-being. The management includes various activities, such as agricultural production, health services, maintenance and adaptation measures such as water and environmental management, as well as adjustments to climate change and variability (Pisupati and Subramanian, 2010). Their traditional management systems have evolved to harmoniously blend in with regional ecosystems. This integration is so profound that ecosystems and cultivated landscapes can be regarded as "biocultural" entities (Arico and Valderrama, 2010).

Therefore, the use of TEK, in the guise of ecological management practices, is acknowledged as a potent conservation tool. In this context, community support consistently proves pivotal in sustaining conservation plans over the long term. Furthermore, community-based management plans tend to work better than top-down (usually Western) approaches to conservation. Due to their holistic perspective on the environment, many indigenous communities recognize interconnections among ecological processes, species interactions and abiotic factors shaping species biology. This understanding of environmental linkages stems from extensive, longstanding engagement with specific regions and may not be readily apparent to those lacking intimate familiarity with the area. Consequently, the inclusion of TEK elements in research programs is essential. Not only can native and local people give access to location-specific knowledge, but also enhanced understanding of environmental connections and empowerment through local capacity building (Drew, 2005). However, it's crucial to highlight the difference between TEK and its implementation via customary management practices, whether conservation-oriented or not. While these con-

The inclusion of Traditional Ecological Knowledge elements in research programs is essential. Not only can native and local people give access to location-specific knowledge, but also enhanced understanding of environmental connections and empowerment through local capacity building.

cepts are interconnected, effective land and water management relies on the prudent utilization of knowledge. Consequently, TEK serves as the intellectual foundation for such practices, while customary ecological management practices represent strategies grounded in applied TEK. Numerous efforts, especially in marine contexts, have concentrated on incorporating customary ecological management practices into conservation strategies (Drew, 2005).

Local and traditional knowledge held by fishers, such as the artisanal fishing community of Chorrillos in Peru, represents a significant yet underutilized resource for understanding the dynamics of coastal ecosystems, including both continuity and change. Fishers' extensive experience in coastal environments, combined with their direct interactions enriches our understanding of these ecosystems over time (Fischer et. al., 2015). With increasing acceptance among scientists and managers that coastal fisheries require ecosystem-wide management rather than focusing solely on individual species populations, the lack of understanding regarding coastal fishery ecosystem processes becomes increasingly apparent. In the marine realm, climate change presents numerous risks, including heightened flooding, species extinction and intensified effects of natural disasters. Additionally, ongoing ocean acidification could profoundly impact marine ecosystems and the services they offer. Given these challenges,

it's imperative to leverage local knowledge of the marine environment as a crucial element in adaptive management strategies (Arico and Valderrama, 2010).

The greater and more refined ecological knowledge fishers, resource managers and scientists have, the more likely their ability to make precise predictions regarding the status and distribution of fishery resources. In this regard, both WS and TEK share similar objectives and should therefore push collaborations forward (Fischer et. al., 2015). To achieve genuine two-way knowledge exchange, the platforms and venues for fostering fishery knowledge should be democratized. Fishers are likely to contribute more knowledge and engage further in applying ecological insights to management when they feel assured that their contributions will be heard and valued (Fischer et. al., 2015).

Conservation efforts continuously adapt to confront the diverse and ever-changing threats to the environment. In this ongoing evolution, it's imperative to explore novel techniques and disciplines to effectively address these challenges (Drew, 2005). In this context, knowledge is pivotal in fostering sustainable relationships between society and the biosphere. It not only drives practical advancements like technology but also shapes societal values and informs national policies. The challenge lies in implementing a paradigm shift giving emphasis to management systems that embrace diverse knowledge and practices, moving away from standardized approaches. Promoting a mosaic of traditional management systems, in which indigenous and native people are equal, is crucial. Ultimately, traditional, local and scientific knowledge systems must engage in a genuine dialogue to identify adaptive solutions for sustainable development in response to evolving natural and socio-economic conditions (Arico and Valderrama, 2010).

4 TEK in policy and law

But how exactly is TEK legally protected, and what are suitable measures for acknowledging and promoting this body of knowledge? The following chapters delve into global and national legal frameworks as well as ways to preserve TEK, followed by recommendations for sound policy-making in the ecology of sustainable development.

The recognition of TEK was initially highlighted in the Brundtland Report of 1987. This pivotal document globally acknowledged the significant potential contribution of Indigenous peoples in addressing pressing environmental challenges.

4.1 Protection and legal framework

Once TEK has been disseminated beyond the community, those recipients might further distribute it to third parties who haven't consented to adhere to social conventions and aren't legally obligated to do so. Regardless of the good intentions, established protocols and best practices, the shared knowledge isn't regulated by customary laws or community aspirations. Instead, it falls under foreign legal frameworks such as public domain, intellectual property and freedom of expression. Therefore countries have begun to put into place laws and regulations that protect the transfer of TEK to third parties (Hardison and Williams, 2013).

The recognition of TEK was initially highlighted in the Brundtland Report of 1987. This pivotal document globally acknowledged the significant potential contribution of Indigenous peoples in addressing pressing environmental challenges. The UN Declaration on the Rights of Indigenous Peoples, adopted by the UN Human Rights Council in 2006, emphasizes two main points:

a) Indigenous peoples have the right to not only preserve, control, protect, and develop their cultural heritage but they also hold intellectual property rights over these assets.

b) States are obliged to collaborate with indigenous peoples in implementing effective measures to recognize and protect these rights.

Furthermore, Principle 22 of the Rio Declaration on Environment and Development acknowledges the crucial role of native people in

management as well as development and advocates for the recognition of their cultural identity and interests in participating towards sustainable development. Since 2010, the Nagoya Protocol is the leading global framework for safe-guarding TEK and ensuring fair benefit-sharing from genetic resource use. This legally binding agreement mandates that access to TEK linked with genetic resources requires prior informed consent and equitable participation. The Framework Convention on Biological Diversity, under Article 8 (j), highlights the significance of acknowledging IK and confirms TEK as a crucial "technology" for implementing effective biodiversity conservation and sustainable practices under Article 16 (Naureen, 2020). The rights of indigenous peoples within the right to development (Article 1 of the Declaration on the Right to Development), are closely associated with various overarching international legal standards and principles. These include participation rights, the right to self-determination, and the recognition and application of collective rights related to land and natural resources (Naureen, 2020)

Additional major instruments that acknowledge native peoples' right to protect TEK are the "Universal Declaration of Human Rights" (Article 27), the "International Covenant on Economic, Social and Cultural Rights" (Article 15, paragraph 1 (c)), the "International Labour Organisation Convention No.169 concerning Indigenous and Tribal Peoples in Independent Countries" (Articles 13, 15, 23) and the Agenda 21 (Paragraph 26.1). (Aboriginal and Torres Strait Islander Social Justice Commissioner, 2009)

On the national level of Peru, the proposal for the protection of TEK outlines in its first article, that the Peruvian government has to recognize indigenous peoples' rights to determine the fate of their collective knowledge. This acknowledgment is based in the constitutional right to intellectual creativity and property, as stated in article 2(8) of the National Constitution of 1993. Additionally, "Decision 391" recognizes Native communities' rights to innovations and practices in Article 7. Law No. 26839, concerning the conservation and sustainable use of biological diversity, enacted in 1997, mandates in Article 24 that the knowledge and innovations of these communities

form part of their cultural heritage, necessitating mechanisms for their regulation and dissemination (Paden, 2007).

As for preserving and promoting TEK, communities and actors involved can take various actions to raise awareness about the value of TEK: adequate documentation of local practices (eg. data-banks or libraries), education and transmission, cultural revitalization, networking and collaboration but also observing and signing agreements so that TEK is not misused and benefits return to the community from which they originate (The World Bank, 1998).

4.2 Sound policymaking

The achievement of the UN Sustainable Development Goals (SDGs) and other globally agreed development objectives heavily relies on a shared understanding of the fundamental principles of effective, sustainable governance (CEPA, 2018). Therefore, institutions and policy-makers play a crucial role to meet these targets. Unfortunately, public sector reforms remain a major challenge in many countries. But how to improve on the governmental capacity to listen, to analyse, to deliver and to leave no-one behind remains the challenge.

In order to address this issues, the Committee of Experts on Public Administration (CEPA) has formulated a serie of principles regarding effective governance for sustainable development. These voluntary principles aim to offer practical, expert advice to interested nations on various governance obstacles linked to the implementation of the 2030 Agenda (CEPA, 2019). These fundamental principles are applicable to all public institutions, including executive and legislative organs, as well as sectors like security, justice, independent constitutional bodies and state corporations (CEPA, 2018). The principles are designed to not only engage the relevant UN organizations, regional organizations as well as professional and local communities, in an inclusive manner, but also to provide a baseline for responsible policy-making (CEPA, 2019).

One of the first three principles that focus on effectiveness, is sound policy-making. It refers to well-crafted and effective strategies or guidelines designed to address specific issues or achieve par-

tical goals in a manner that is rational, evidence-based and conducive to positive outcomes. According to CEPA there are eight pathways to sound policy-making: "Strategic planning and foresight, regulatory impact analysis, promotion of coherent policymaking, strengthening national statistical systems, monitoring and evaluation systems, science-policy interface, risk management frameworks and data sharing", (CEPA, 2019) while promoting the common good and long-term sustainability.

Sound policy offers multiple advantages for placed-based communities and Native people: Firstly, it can facilitate the recognition and validation of TEK within legal and regulatory frameworks. This involves acknowledging the cultural significance and validity of IK systems alongside scientific evidence. By legally recognizing TEK, policymakers can ensure its protection, respect its ownership rights and provide mechanisms for its incorporation into decision-making processes. Secondly, sound policy can promote collaboration and co-management arrangements between government agencies, local and indigenous communities and other stakeholders. By fostering partnerships based on mutual respect and shared governance, policies can enable the participation of local communities in natural resource management. This can lead to the co-design and imple-

Policy support is crucial for TEK's recognition in science and society. Sound policy may serve as a vital bridge between state, national as well as regional economic actors, policymakers and local communities such as the artisanal fishers in Chorrillos in recognizing the importance of their practices and knowledge on society, government and science.

mentation of policies that integrate TEK with scientific approaches, leading to more holistic and effective resource management strategies. And last but not least, sound policy can incentivize the incorporation of TEK into land-use planning, conservation strategies, and sustainable development initiatives.

5 Conclusion

This paper explored TEK and identified its six faces, each of which is an important dimension to consider in the exchange of cultural values, legal complexities and risks to environmental sustainability. Furthermore, TEK was compared with the modern scientific system and areas as well as topics of convergence and potential synergy of collaboration between the two bodies of knowledge were presented. However, it is important to bear in mind that (what has been reported) remains incomplete, precisely because combining TEK and WS is a complex attempt that requires group-based interdisciplinary collaboration. Participation of local and indigenous people should not be limited to impact assessments for projects, but should also take place in the strategic planning phase. Because these communities may hesitate to share their knowledge due to a history of exploitation, inadequate recognition and respect for their values and rights, partnership and co-management arrangements will have to be designed in such a way that locals can be involved from the initial stages of decision-making processes and that TEK is properly safeguarded. Therefore, policy support is crucial for TEK's recognition in science and society, fostering a broader paradigm for integrating diverse knowledge systems. Latin American countries in particular, face multiple challenges in implementing protections for TEK, due to the lack of political will, insufficient coordination, limited financial resources and the adverse impact of multinationals (Paden, 2007). Sound policy may serve as a vital bridge between state, national as well as regional economic actors, policymakers and local communities such as the artisanal fishers in Chorrillos in recognizing the importance of their practices and knowledge on society, government and science. Effective policy mechanisms can provide the necessary framework for acknowledging, validating, and integrating TEK into decision-making

processes and can promote a more inclusive and holistic approach to environmental management, conservation and sustainable development.



Nina Giordano

is studying Nonprofit and NGO Management (B.A.) in the 4th semester at the Environmental Campus Birkenfeld, Trier University of Applied Sciences. As part of an internal university project, she works as a student research assistant in the field of "socio-cultural changes through algorithmic intelligence". In addition to her study, she works as visual communication designer and volunteers as a board member of the German association "Films for the Earth", that promotes environmental education in schools.

Strategy to promote the Human Right to an adequate standard of living for Peruvian artisanal fishers according to Article 25 of the Universal Declaration of Human Rights

Author: Yasmin Krami

Table of contents

1 Introduction	152
2 Universal Declaration of Human Rights	152
2.1 Protection of Human Rights.....	153
2.2 Standard of living in Peru.....	154
3 Peruvian fishers	156
3.1 Working conditions of Peruvian fishermen.....	156
3.2 Comparison: working conditions in other countries.....	158
4 Conclusion	158

1 Introduction

This term paper delves into the human right to an adequate standard of living, a fundamental principle articulated in the Universal Declaration of Human Rights (UDHR). The specific context under examination is the livelihood of artisanal Peruvian fishermen. The inquiry centers on understanding the prevailing standard of living for these individuals and exploring avenues for its optimization in harmony with both the environment and legal frameworks. In particular, this paper aims to identify and propose solutions for enhancing the living standards and working conditions of artisanal Peruvian fishermen, aligning with the principles of human rights, environmental sustainability, and legal compliance.

2. Universal Declaration of Human Rights

The Universal Declaration of Human Rights (United Nations, 2015) (UDHR) is a seminal document

adopted by the United Nations on December 10, 1948. It asserts that every individual, regardless of their origin, race, religion, or other characteristics, is entitled to the fundamental rights and freedoms outlined in the declaration. Comprising 30 articles, the declaration covers a broad spectrum of rights, including the right to life, liberty, freedom of opinion, work, education, and protection against discrimination. Fundamental principles enshrined in the UDHR include equality, freedom, justice, and human dignity. This declaration has played a pivotal role in shaping the international human rights framework, influencing the creation of subsequent treaties and conventions. As a fundamental reference point, the Universal Declaration of Human Rights actively contributes to the promotion and protection of human rights globally.

2.1 Protection of Human Rights

The protection of human rights is ensured through various mechanisms at international, national, and local levels (United Nations, 2015). Internationally, fundamental human rights standards are established through international agreements ratified by member states, often under the auspices of the United Nations. These agreements obligate states to respect, protect, and ensure the human rights enshrined in them. At the national level, most countries implement human rights through national legislation. Constitutions, laws, and legal structures create a framework aimed at ensuring the protection and promotion of individual freedoms and fundamental rights. Courts play a crucial role in interpreting and applying these laws to ensure accountability for human rights violations. In addition to legal instruments, civil society organizations and human rights defenders contribute to protecting human rights. NGOs monitor compliance with human rights standards, raise awareness, and actively advocate for the rights of vulnerable communities and individuals. An example of NGO projects are on the "GlobalGiving" platform (www.globalgiving.org); they support the connection of non-profits with donors and companies. Right now "MarFund" is collecting money to empower fishing communities in the MAR reef on the "GlobalGiving" platform.

Participatory approaches, involving affected communities in decision-making processes, are also crucial. Participatory methods ensure that political measures take into account the needs and perspectives of local people.

Overall, securing human rights requires comprehensive collaboration among governments, international organizations, civil society, and the broader population to foster a culture of respect and protection for the fundamental rights of every individual. As an example, Amnesty International supports human rights educators by providing manuals (Amnesty International, 2011).

In Peru, the protection of human rights is ensured through various mechanisms at both national and international levels. The country's constitution and national laws form the legal basis for the protection of human rights, aligning with international agreements such as the Universal Declaration of Human Rights. Peru is a signatory to

numerous international human rights agreements, obligating it to adhere to the standards outlined in these agreements. The National Human Rights Council of Peru monitors the human rights situation in the country and provides recommendations for improvement. Civil society organizations play a vital role in documenting human rights violations, supporting vulnerable populations, and raising awareness of issues. Community participation is essential, ensuring that the needs of affected communities are considered in political decision-making processes. Despite progress, Peru faces challenges such as social inequality and discrimination, necessitating ongoing efforts to promote and secure human rights in the country. Human rights issues in Peru are governmental corruption, unlawful kills, restrictions and violence against journalists, threats against NGOs and lack of information and education (Bureau of democracy, human rights, and labor, 2022).

Human rights violations can be litigated in Peru, where the right to legal protection is a fundamental principle of international human rights instruments. Individuals or groups can file lawsuits before national courts in Peru, citing the national constitution, laws, or international human rights agreements.

Additionally, the option exists to appeal to the Inter-American Court of Human Rights since Peru is a member of the Organization of American States (OAS). The Inter-American Court can handle cases when all national legal remedies have been exhausted.

In certain situations, human rights violations can also be brought before international courts, such as the International Criminal Court (ICC) or other international tribunals. This provides an additional layer of protection for victims of serious human rights violations.

The human right to an adequate standard of living is enshrined in various international human rights documents, including Article 25 of the Universal Declaration of Human Rights and Article 11 of the International Covenant on Economic, Social, and Cultural Rights.

According to this right, every person has the entitlement to a standard of living that ensures health and well-being for themselves and their family. This includes the right to adequate food,

clothing, housing, medical care, and necessary social services.

Governments are required to take measures to ensure that their citizens have access to basic resources necessary for a dignified life. This involves initiatives to combat poverty, provide healthcare, education, and social security. Protecting this human right contributes to reducing social inequalities and improving living conditions for people.

2.2 Standard of living in Peru

The standard of living includes the level of income, comforts and services available in a society. Everyone, especially children and women have social and economic rights. The focus is on well-being and health as well as safety. No one should fall under a certain limit. It is based on article 25 of the Universal Declaration of Human Rights that nobody gets into existential distress and to ensure freedom.

In this case, Maslow's hierarchy of needs can be invoked, how a person fulfils his needs (Maslow, 1943). Maslow's Pyramid of Needs is a theory by Abraham Maslow that represents human needs in a hierarchy. It starts with basic physiological needs, such as food and sleep, followed by security needs, such as shelter and work. Then come social needs, which concern relationships and belonging.

The next level is related to the pursuit of appreciation and recognition, while the highest level is self-actualization, in which individuals strive for personal growth and fulfilment. The pyramid illustrates that the satisfaction of higher needs is only possible when basic needs are met, and serves as a model for human motivation.

In summary, as long as their basic needs are unmet, people primarily focus on fulfilling them. Only after these fundamental needs are satisfied do individual aspirations for personal growth and self-actualization intensify.

In Peru, the human right to an adequate standard of living is anchored in national legislation and international commitments. According to the national constitution and international human rights agreements, including the International Covenant on Economic, Social, and Cultural Rights, every citizen of Peru has the right to a standard of living that guarantees health, well-being, and dignity.

By this you have to keep in mind that standard of living in developing countries is not the same as standard of living in modern. Especially in emerging markets, there are differences between rich and poor (i.e. a high and a low standard) (Kohl, 1998).

The cost of living can be estimated at 535 to 810 euros per month (Numbeo, n. D.). And the minimum wage is 250.74 euros (1,025 PEN) (Lano, n. D.). Of course, this varies greatly depending on your personal lifestyle: costs for rent between 370 and 460 EUR, food for one person between 150 and 300 EUR, mobility between 15 EUR (local transport) and 50 EUR (car excl. fuel).

Furthermore it is important to note that there could also be unplanned costs such as curing an illness. If you have children, there are further costs for school and e.g. clothing and food. Government support is often only available to the poorest sections of the population. Furthermore, costs for entertainment, leisure and insurance have not yet been factored in.

Based on the findings of a 2023 study conducted by Pulso Ciudadano and compiled by Activa Peru, the consideration of implementing a living wage in Peru to meet the needs of the population seems plausible (Activa, 2023). According to this study, an amount exceeding three times the current minimum wage would be necessary to ensure a decent standard of living in a communal setting in Peru. This suggests that the current minimum wage might not be sufficient to adequately cover the cost of living.

There is also the question of how to bring the standard of living into harmony with the environment. It is not realistic to replicate the standard of living of the industrialized countries worldwide. This is because our planet's resources would not be sufficient to both provide for the human population and maintain the stability of ecosystems. The international study "Living Planet Report", published annually by the Global Footprint Network, confirms this: To make the lifestyle of today's Americans possible, it would take five Earths, as was noted in 2014.

Given the fundamental need for an intact environment for a high standard of living, systems scientists such as Elvin Laszlo propose to find a solution by developing new values that go beyond

The international study "Living Planet Report" published by the Global Footprint Network in 2014, confirms the impossibility to replicate the standard of living of the industrialized countries worldwide: "To make the lifestyle of today's Americans possible, it would take five Earths"

the ideology of constant growth (Laszlo, 1998). He argues that the term "standard of living" in the sense of "quality of life" must be completely redefined and sustainably in order to both meet the demands of human rights and to preserve the regenerative capacity of the biosphere in the long term.

So we need a solution for fishermen that is in harmony with the environment. That would be the longest-term solution possible. In addition, the aim is not to live in the greatest luxury, but to live a fair life without exploitation. In addition, there should be a balance between professional obligations (work life) and personal or family interests and activities (United Nations Development Programme (UNDP), 2015). A viable long-term solution involves enhancing the profession of "fisher" by implementing the principles of "sustainable work", as proposed in the United Nations Development Programme's report on "Work and Human Development" (UNDP, 2015). This entails integrating sustainable practices into the fishing industry to ensure the well-being of both the environment and the individuals engaged in fishing activities. By adopting the sustainable work paradigm outlined in the UNDP report, the fishing profession can evolve towards a more environmentally conscious and socially responsible model, fostering enduring benefits for both the fisheries sector and the broader community.

Despite progress, Peru continues to face challenges, especially in rural areas and marginalized communities where access to these basic re-

sources is often restricted. Collaboration between the government, civil society, and international organizations is crucial to strengthening the implementation of this human right and reducing social inequalities.

A current challenge for Peru and its fishermen is probably the biggest environmental disaster the country has ever experienced (Katholische Nachrichten-Agentur (KNA), 2022). This was triggered by a volcanic eruption of the "Hunga Tonga-Hunga Ha'apai" volcano, which caused tidal waves. This led to a spill of 6,000 barrels of crude oil in Peru during the unloading of a tanker at the Pampilla refinery in Ventanilla, in the province of Callao.

The Catholic Church in Peru has called for swift intervention by the authorities and called on those responsible to repair the environmental damage. She pointed out that there is great public concern and dismay about the disaster. Another report shows that the fishermen suffered financial losses because no one wanted to buy the fish they caught at the time, due to the smell of oil (Nachrichtenpool Lateinamerika, 2022).

In addition to the fishermen, the ecosystem, the inhabitants and the wildlife are also suffering from the disaster and are at risk. In the waters off the coast of Peru, there are fish that are threatened with extinction and are considered particularly worthy of protection. According to official data, a total of 17 beaches and two nature reserves are affected by the oil spill.

In 2022, a dispute over responsibility erupted between the oil company Repsol and the government. The company accuses the authorities of failing to issue tsunami warnings before the accident. Environmentalists, on the other hand, accuse Repsol of trying to cover up an industrial accident that had nothing to do with the volcanic eruption. After the oil spill in Peru, people in over 15 countries protested together against the destruction of the oceans caused by offshore oil and gas extraction (analyse & kritik Zeitung für Debatte & Praxis, 2022). The livelihoods of at least 1,500 fishermen were destroyed by the disaster.

In 2023, there was reporting in the media such as the Tagesschau about riots by police officers against social minorities such as the indigenous population (Tagesschau, 2023). According to Tagesschau, they are disappointed by the govern-

ment, as they feel left behind. In addition, there have been several changes of president in the past and some have subsequently gone into hiding in another country. This shows that it is difficult to hold the concrete actors accountable and that peace hangs in the balance. As well as a certain racism, because explicitly people of a unit were killed by the police, this completely without valid and legal, as well as fair reason. This is completely arbitrary and without any legal basis. Human rights activists have failed several times in the past, according to amnesty international, they even received death threats in neighbouring Colombia (Amnesty International, 2023).

Holding the government accountable through legal means, particularly when it comes to specific individuals like politicians, appears to be a challenging endeavor. This highlights the societal divide and underscores the precarious state of peace (Vatican News, 2018). The lack of universal acceptance of the president and wide-spread dissatisfaction contribute to this tension. Moreover, the closely contested election results prompted cardinal Pedro Ricardoto appeal to the population to acknowledge the outcome (KNA, 2021).

In conclusion, ensuring safety should be the foremost priority, with financial considerations being secondary-though essential for maintaining a high standard of living.

3. Peruvian fishers

In Chorrillos, Peru, there are different types of fishermen, including artisanal and industrial fishers. At one hand Artisanal fishermen often rely on traditional knowledge and techniques passed down through generations. They typically engage in small-scale, traditional fishing practices and small boats. On the other hand, industrial fishermen operate on a larger scale, using more advanced equipment and vessels.

3.1 working conditions of Peruvian fishermen

The working conditions for Peruvian fishermen can vary significantly. Overall, the working conditions for both artisanal and industrial fishermen can be influenced by factors like economic dynamics, environmental conditions, and government regulations. Industrial fishermen, due to the scale of their operations, may have access to more re-

sources and technology. However, they might also encounter challenges such as competition, market fluctuations, and adherence to sustainability practices. Artisanal fishermen may face challenges related to limited resources, economic pressures, and sometimes, precarious working conditions. They often rely on traditional knowledge and techniques passed down through generations.

Laws such as the "Ley General de Pesca", a general fisheries law, contain relevant provisions in the field of fisheries and maritime affairs. The aim of this law is to regulate fisheries with the goal of promoting the sustainable development of fisheries as a source of food, employment, and income. Simultaneously, it seeks to ensure responsible utilization of hydrobiological resources, optimizing economic benefits in harmony with environmental protection and the preservation of biodiversity. The hydrobiological resources within Peru's territorial waters are considered a national heritage, and it is the responsibility of the state to govern the management and rational utilization of these resources, given that fisheries activities are of national interest (Artículo 1 and Artículo 2 of ley general de pesca).

In Peru, there is also a Ministry of Production for permitting, execution and monitoring at all levels, including fisheries, as well as a Ministry of Labour and Employment Promotion (Ministry of Production, 2017). These deal with the current regulations for the working conditions of fishermen. Its competence extends to natural and legal persons carrying out activities intended for the industry and fisheries sub-sectors, with a vice-ministry for each of these sub-sectors.

Often, working conditions are dangerous, and more than five million fishermen earn less than a dollar a day. However, it should be borne in mind that some of the conditions have only deteriorated as a result of competition with large-scale industrial fishermen. All in all, there are many advantages associated with small-scale fishing: industrial fisheries require about 200 people to catch 1000 tonnes of fish, while small-scale fisheries require about 2400 people to catch the same amount. These higher employment effects in small-scale fisheries could be interpreted as an indication of their inefficiency (Jaquete and Pauly, 2008).

The monthly income that a fisherman should earn should always be enough to finance food, housing and education. However, it is also important to secure life in old age after work and also to ensure continued payment of wages in the event of illness or death for surviving dependents.

The work on the boat must also be made as safe as possible. By overseas rescue, technically good boats and boats that are regularly maintained. The fishermen also need money to be able to buy a new boat in 10 years at the latest. Because the boat secures their existence. They are also accompanied by day-to-day costs, such as those for petrol or for nets and other equipment such as bait, storage, transport, workers on the boat and at the dock, water to maintain hygiene and clean the caught fish, as well as cleaning the boat and equipment and repairs to the boat.

In Peru, there are various measures and organizations that are actively involved in sea rescue, both government agencies and non-governmental organizations (NGOs) are involved in the implementation of these rescue operations. In the event of emergencies, such as boat accidents or other distress situations at sea, the Peruvian coast guards, such as "Comandancia de Operaciones Guardacostas", can intervene to rescue the fishermen.

The protection of fishermen in Chorrillos, Peru, involves a comprehensive approach addressing various factors influencing their lives and work. National legal frameworks, including laws and regulations, play a crucial role in ensuring sustainable fishing practices and protecting marine resources. Peru's commitment to international human rights agreements further contributes to the protection of fishermen.

Environmental and fisheries management practices are implemented to prevent overfishing and preserve marine ecosystems, providing an additional layer of protection. Local social support programs, including education and healthcare services, coupled with the empowerment of fishing communities, contribute to improving the standard of living and protection of fishermen.

Challenges may persist, particularly concerning economic conditions, environmental impacts, and social equity. It is essential to monitor developments in the region, as legal disputes and protective initiatives can evolve over time.

The current situation of fishermen in Chorrillos, Peru, is marked by discussions surrounding the redesign of the dock. Fishermen appear to be secondary in this project for the Costa Verde Authority and the Club, who seem to prefer a scenario without fishermen. Efforts to symbolically include fishermen in plans for the future dock contrast with challenges arising from the fishermen's lack of formal education and knowledge. It remains to be seen how fishermen can articulate their position in the public discourse, highlighting that their needs and perspectives should be considered in the redesign of the dock (Bombiella Medina, 2016).

The concept of "sustainable work", as presented in the United Nations Development Programme's report "Work and Human Development" in 2015, characterizes sustainable work as an activity that promotes human development and simultaneously contributes to mitigating or eliminating negative impacts in various geographical and temporal contexts. It plays a crucial role not only in preserving our planet but also in ensuring that future generations continue to have access to employment opportunities. This paradigm emphasizes the significance of work and the associated potentials for unfolding human capabilities, as illustrated by the "Matrix of Sustainable Work".

In summary, ensuring the sustainability of the fishing profession and combating ocean overfishing are crucial. Additionally, efforts should focus on enhancing working conditions to attract future generations to the industry, and the rights of indigenous peoples must receive heightened recognition. Their active involvement in shaping future reforms is imperative. Protective measures for fishermen encompass legal frameworks, environmental and fisheries management, and local social programs. The current situation, especially in Chorrillos, highlights discussions about the redesign of the dock, where the needs of fishermen may not be adequately considered. It is crucial to understand the complexity of working conditions and cultural influences to develop effective measures for the protection of fishermen and marine resources.

In Iceland, robust labor laws extend to the fishing industry, regulating working hours, wages, and safety standards. With its deeply rooted fishing tradition, Iceland integrates cultural practices into its fishing industry. Modern regulations are also in place to ensure the safety and well-being of fishermen.

3.2 Comparison: working conditions in other countries

The working conditions of fishermen vary worldwide. In the following, I would like to examine those in New Zealand, Iceland, and Mexico more closely.

In New Zealand, the fishing sector adheres to strict standards encompassing safety measures and labor regulations. Fishermen benefit from legal frameworks governing aspects such as working hours, wages, and occupational safety. The country places a strong emphasis on sustainable fishing practices and enforces regulations to effectively manage and preserve marine resources (Internationales Arbeitsamt, 2003).

In Iceland, robust labor laws extend to the fishing industry, regulating working hours, wages, and safety standards. With its deeply rooted fishing tradition, Iceland integrates cultural practices into its fishing industry. Modern regulations are also in place to ensure the safety and well-being of fishermen. Similar to New Zealand, Iceland emphasizes sustainability in fishing and implements measures to maintain healthy marine ecosystems and prevent overfishing.

Mexico's fishing industry faces unique challenges, including issues related to overfishing and unsustainable practices. Although efforts are underway to address these challenges, there is a need for stricter enforcement and improved sustainability measures. The Mexican government has initiated programs to promote sustainable

fishing and protect marine ecosystems. Collaborating with local communities, it seeks to align economic activities with environmental conservation. The industry in Mexico is also influenced by cultural practices and traditions, posing a challenge in balancing tradition with modern regulations.

A comparative analysis reveals the diversity of approaches in the regulation and management of fishing industries. New Zealand and Iceland prioritize stringent regulations and sustainability, emphasizing strict enforcement for safer working conditions. Mexico grapples with the dual challenge of preserving cultural practices while implementing modern conservation measures. Striking a balance between tradition and modernity is crucial for the long-term sustainability of the fishing industry.

In summary, understanding the complexities of regulatory frameworks, cultural influences, and sustainability practices is essential for developing effective policies that ensure the well-being of fishermen and the protection of marine resources.

4. Conclusion

In conclusion, this thesis provides a comprehensive exploration of the challenges and potential solutions concerning the human right to an adequate standard of living for Peruvian fishermen in Chorrillos. The examination was framed within the context of the Universal Declaration of Human Rights and its fundamental principles.

The UDHR holds a pivotal position in the international human rights framework, and Peru has implemented protection mechanisms across different tiers. However, persistent issues like social inequality pose ongoing challenges. The human right to an adequate standard of living, encompassing dimensions such as income, health, and dignity, faces unique hurdles in the context of developing countries.

The case study of Peruvian fishermen in Chorrillos serves as a poignant illustration of a myriad of challenges spanning from working conditions to grappling with environmental catastrophes. Throughout the discourse, there is a resounding emphasis on the critical role of sustainable fishing practices, not only to mitigate environmental impact but also to foster a sense of environmental consciousness and social responsibility.

A comparative analysis shedding light on the working conditions of fishermen in New Zealand, Iceland, and Mexico elucidates the divergence in regulatory approaches. New Zealand and Iceland prioritize stringent regulations and sustainability, whereas Mexico grapples with the intricate task of harmonizing cultural practices with contemporary conservation measures.

In summary, the overarching conclusion underscores the imperative for a holistic and integrated approach to ensure long-term sustainability. Striking a delicate balance between tradition and modernity is deemed essential for safeguarding the well-being of fishermen. The journey towards securing the livelihoods of these individuals necessitates sustained efforts and collaborative endeavors across diverse levels of governance and society.



Yasmin Krami

is currently studying environmental and business law in her 5th semester with a focus on business law at the Environmental Campus of Birkenfeld, Trier University of Applied Sciences.

Conclusion

In summary, the individual analysis/chapters highlight the multifaceted challenges faced by Peruvian artisanal fishers in Chorrillos. Despite Peru's efforts to implement protective measures in line with the Universal Declaration of Human Rights, persistent issues such as social inequality remain, hindering progress. The unique obstacles in developing countries underscore the complexity of ensuring this fundamental right, encompassing aspects such as income, health, and dignity. The case study of Peruvian fishermen in Chorrillos serves as a poignant reminder of the myriad challenges they face, from precarious working conditions to environmental disasters. Emphasizing sustainable fishing practices proves crucial not only for mitigating environmental damage but also for promoting environmental awareness and social responsibility.

Considering political aspects, urgent action is needed to address management approaches concerning Peru's artisanal fisheries. Implementing ABFMs is crucial for ensuring the sustainable use of marine ecosystems and the recovery of biomass. ABFMs, which include spatially defined conservation policies, have proven effective in halting overfishing and promoting resource sustainability. By establishing restrictions on fishing activities based on time, space and type, ABFMs can mitigate the negative impacts of fishing while supporting ecosystem health. Furthermore, the adoption of IMTA presents an opportunity to reconcile the growing demand for fish with environmental sustainability. IMTA involves integrating different aquaculture species to maximize efficiency and profitability while minimizing ecological harm. By harmonizing species interactions and ecosystem conditions, IMTA offers a path towards sustainable aquaculture practices that can enhance biodiversity and ecosystem resilience. Addressing transboundary issues is also critical, as evidenced by collaborative efforts between Chile and Peru in the GEF-UNDP Humboldt Project. Developing

a Transboundary Diagnostic Analysis and Strategic Action Program can help identify and address pressing concerns affecting the Humboldt Current System's health. These initiatives underscore the need for collaborative management approaches and highlight socioeconomic and environmental challenges such as overfishing, pollution, and climate variability. The OSPA in Peru has brought positive changes for artisanal fishers without requiring significant financial capital, which demonstrates the potential for local and trans-local unions. In this manner, artisanal fishers should be encouraged to organize and collaborate to address improvements, problems, and disagreements collectively. Without active action and stronger collective commitment, theoretical management approaches and improvement potentials cannot be effectively implemented. But besides the need of self-initiatives from local communities, the government and authorities need to demonstrate a higher level of commitment, respect, visibility, and integration towards artisanal fishers to fully tap into their potential for shaping the country. These two facts are mutually dependent.

TEK is crucial for sustainable development due to its unique insights into ecosystems, biodiversity, and natural resource management. Unlike scientific knowledge, which often prioritizes quantifiable data and experiments, TEK is rooted in generations of experiential learning and intimate connections with the environment. TEK offers invaluable wisdom on sustainable fishing practices, conservation strategies, and adaptation to environmental changes. By incorporating TEK into decision-making processes, policymakers can benefit from holistic perspectives that prioritize environmental harmony, social equity, and cultural preservation. Furthermore, embracing TEK fosters respect for diverse cultural traditions and promotes collaboration between different knowledge systems. The involvement of local knowledge shouldn't just be an afterthought relegated to impact assessments

during project evaluations; rather, it should be integral from the outset, starting with strategic planning. It's imperative to establish partnership and co-management structures that enable their participation in decision-making processes right from the start, ensuring the proper safeguarding of TEK. Policy support plays a pivotal role in advancing the recognition of TEK within both scientific circles and society at large. Challenges include a dearth of political will, inadequate coordination, financial constraints, and the overpowering influence of multinational corporations. Sound policy mechanisms provide the necessary framework for acknowledging, validating, and integrating the local knowledge of communities such as the artisanal fishers of Chorrillos into decision-making processes, thereby promoting a more comprehensive and inclusive approach to environmental management, conservation, and sustainable development.

The "Strategy to promote the standard of living according to Article 25 of the UDHR" emphasizes the importance of adopting a comprehensive and inclusive approach to ensure long-term sustainability. Achieving this goal requires delicately balancing tradition and modernity, necessitating concerted efforts from both the government and society. To begin with, promoting robust legal frameworks for sustainable fishing involves ensuring the protection of marine resources and the safety and well-being of fishermen through the implementation of stronger regulations and enforcement measures. Secondly, encouraging sustainable work practices in the fishing industry, guided by the UNDP's principles, integrates environmental and social responsibility to secure long-term benefits for both fishermen and the environment. Furthermore, empowering fishing communities through active participation, educational initiatives, improved access to healthcare, and the creation of diverse economic opportunities serves to elevate living standards and mitigate social inequalities. Moreover, fostering international cooperation to address environmental and climate-related challenges affecting fishermen entails sharing best practices and coordinating responses to ensure the sustainable management of marine resources. Additionally, raising public awareness about fishermen's rights, sustainable fishing practices, and

environmental conservation through various campaigns, media platforms, and advocacy efforts is crucial for mobilizing support for policy reforms. Furthermore, providing targeted assistance to vulnerable populations within fishing communities, such as indigenous peoples and marginalized groups, involves capacity-building, offering legal aid, and implementing tailored initiatives to address their specific needs and challenges. Lastly, promoting research and monitoring efforts to better understand the challenges faced by fishermen and the effectiveness of interventions is essential for making informed decisions and providing targeted support. This includes addressing the needs of indigenous peoples and marginalized groups within these communities.

Ultimately, the success of these efforts depends on all stakeholders embracing the lessons from this research and collectively moving towards a path of concerted action for a fairer and more sustainable future for Peruvian artisanal fishers and their ecosystems.

Bibliography and sources

- Aboriginal and Torres Strait Islander Social Justice Commissioner (2009). *Chapter 7: The protection of Indigenous knowledge's*. 2008 Native Title Report. Human Rights and Equal Opportunity Commission (Ed.).
- Activa (2023). *Pulso Ciudadano Un 36,7% de la población estaría votando en contra en el Plebiscito de Salida para la Propuesta de Nueva Constitución*. Retrieved from: www.chile.activasite.com/estudios/pulso-ciudadano-71/
- Arico, S., Valderrama, G. C. (2010). *Traditional knowledge: From environmental management to territorial development*. Traditional knowledge in policy and practice: Approaches to development and human well-being. Pisupati, B., Subramanian, S. M. (Eds.). United Nations University Press (publ.).
- Baldenhofer, K. G. (2024). *Auswirkungen von ENSO auf die Fischwelt*. Das ENSO-Phänomen. Retrieved from: www.enso.info/impressum.html
- Berkes, F. (2007). *Traditional Ecological Knowledge*. University of Manitoba (Ed.). Natural Resources Institute (publ.).
- Berkes, F. (2012). *Sacred Ecology* (3rd ed.). Routledge (publ.).
- Bombiella Medina, H. A. (2016). *Place-based communities and neoliberalism: A study of the artisanal fishing community of Chorrillos, Peru* [Dissertation]. Iowa State University Ames, Iowa. Retrieved from: www.dr.lib.iastate.edu/server/api/core/bitstreams/bc0ba082-b895-4104-a1f8-1f3467359f61/content
- Caceres, J. C. (2023). *Colombia: hope at risk. The lack of a safe space to defend human rights in Colombia continues*. Retrieved from: www.amnesty.de/sites/default/files/2023-11/Amnesty-Bericht-Kolumbien-Menschenrechtsverteidiger-schuetzen-Drohungen-Gewalt-November-2023.pdf
- Capra, F. (1982). *The turning point – science, society and the rising culture*. Simon and Schuster (publ.).
- Casi, C., Guttorm, H. E., Virtanen, P. K. (2021). *Traditional Ecological Knowledge*. Situating Sustainability: A Handbook of Contexts and Concepts. Krieg, C. P., Toivanen, R. (Eds.). Helsinki University Press (publ.).
- CEPA (2018). *Principles of effective governance for sustainable development*. United Nations Department of Economic and Social Affairs (publ.).
- CEPA (2019). *Principles of effective governance for sustainable development*. United Nations Department of Economic and Social Affairs (publ.).
- Das, A., Devi, R. J., Gujre, N., Mita, S., Rangan, L. (2023). *Traditional ecological knowledge towards natural resource management: perspective and challenges in North East India*. Farooq, M., Gogoi, N., Pisante, M. (Eds.). Sustainable Agriculture and the Environment. Academic Press (publ.).
- De la Puente, S., De la Lama, R. L., Roció, Llerena-Cayo, C., Martínez, B. R., Rey-Cama, G., Christensen, V., Rivera-Ch, M., Valdés-Velasquez, A. (2022). *Adoption of sustainable low-impact fishing practices is not enough to secure sustainable livelihoods and social wellbeing in small-scale*. Marine Policy (Vol. 146). Science Direct (publ.). Retrieved from: www.doi.org/10.1016/j.marpol.2022.105321.
- Deutsche Gesellschaft für die Vereinten Nationen e.V. (2015). *Arbeit und menschliche Entwicklung: Menschlicher Fortschritt in einer ungleichen Welt* [Special issue], DGfVn e.V. (Ed.). BWV.
- Dimitri, G. M. (2015). *Productivity and Sustainable Management of the Humboldt Current*. Science Direct. Retrieved from: www.sciencedirect.com/science/article/pii/S2211464515300397
- Drew, J. A. (2005). *Use of Traditional Ecological Knowledge in Marine Conservation*. Conservation Biology 19(4).
- Ebert, M. (2023). *Staatskrise in Peru: Aufstand der Abgehängten*. Retrieved from: www.tagesschau.de/ausland/amerika/peru-staatskrise-101.html
- Fischer, J., Jorgensen, J., Josupeit, H., Kalikoski, D., Lucas, C.M. (2015). *Fishers' knowledge and the ecosystem approach to fisheries – Applications, experiences and lessons in Latin America*. FAO fisheries and aquaculture technical paper (591). Food and Agriculture Organization of the UN (publ.).
- Frölicher, T. (2019). *Hitzewellen im Ozean - Die unterschätzte Gefahr, Physik in unserer Zeit*. Wiley Online Library.

- Graack, N. (2022). *Repsol, übernahm Verantwortung! Nach der Ölkatastrophe in Peru protestieren Menschen in über 15 Ländern gemeinsam gegen die Zerstörung der Ozeane durch Offshore-Öl- und Gasförderung*. Retrieved from: www.akweb.de/bewegung/repsol-uebernimm-verantwortung/
- Gozzer-Wuest, R., Alonso-Poblacion, E., Rojas-Perea, S., Roa-Ureta, R.H. (2022). *What is at risk due to informality? Economic reasons to transition to secure tenure and active comanagement of the jumbo flying squid artisanal fishery in Peru*. Marine Policy. Elsevier (publ.)
- Hardison, P., Williams, T. (2013, August 15th). *Culture, law, risk and governance: contexts of traditional knowledge in climate change adaptation*. Climate Change and Indigenous Peoples in the United States: Impacts, Experiences, and Actions. Colombi, B. J., Koppel, M. J., Pandya, R. E. (Eds.), Springer Link (publ.). Retrieved from: www.link.springer.com/article/10.1007/s10584-013-0850-0.
- Hoagland, S. J. (2016). *Integrating Traditional Ecological Knowledge with Western Science for Optimal Natural Resource Management*. IK: Other Ways of Knowing (Vol. 3, Issue 1). Pennsylvania State University Libraries (publ.).
- Houde, N. (2007). *The Six Faces of Traditional Ecological Knowledge: Challenges and Opportunities for Canadian Co-Management Arrangements*. Ecology and Society (publ.).
- Iano. *Mitarbeiter in Peru einstellen*. Retrieved from: www.lano.io/de/global-hiring/peru.
- Internationales Arbeitsamt. (2003). *Arbeitsbedingungen im Fischereisektor*. Internat. Arbeitsamt.
- Jara, H. J. (2020). *Current and future socio-ecological vulnerability and adaptation of artisanal fisheries communities in Peru, the case of the Huaura province*. Marine Policy. Elsevier (Ed.).
- Jacquet, D. P., Jacquet, J., Pauly, D. (2008). *Funding Priorities: Big Barriers to Small-Scale Fisheries*. Funding priorities: Big barriers to small-scale fisheries. Conservation Biology: The Journal of the Society for Conservation Biology, 22(4), 832–835. Retrieved from: www.doi.org/10.1111/j.1523-1739.2008.00978.
- Katholische Nachrichten-Agentur (2021). *Peru: Kardinal ruft zu Anerkennung des Wahlergebnisses auf*. Retrieved from: www.weltkirche.katholisch.de/artikel/34764-peru-kardinal-ruft-zu-erkennung-des-wahlergebnisses-auf.
- Katholische Nachrichten-Agentur (2022). *Kirche in Peru fordert Verantwortungsübernahme nach Ölpest*. Retrieved from: www.weltkirche.katholisch.de/artikel/34495-kirche-in-peru-fordert-verantwortungsuebernahme-nach-oelpest.
- Kluger, L. C., Kochalski, S., Aguirre-Velarde, A., Vivar, I., Wolff, M. (2019). *Coping with abrupt environmental change: the impact of the coastal El Niño 2017 on artisanal fisheries and mariculture in North Peru*. ICES Journal of Marine Science, 76 (Issue 4). ICES (Ed.).
- Kohl, K. H. (2012). *Ethnologie - die Wissenschaft vom kulturell Fremden: Eine Einführung* (3rd edition). C.H. Beck Studium. Beck.
- Laszlo, E. (1998). *Systemtheorie als Weltanschauung: Eine ganzheitliche Vision für unsere Zeit*. Diederichs new science. Diederichs.
- Loayza-Aguilar, R. E. (2023). *Integrated Multi-Trophic Aquaculture (IMTA): Strategic model for sustainable mariculture in Samanco Bay, Peru*. Frontiers (publ.). Retrieved from: www.frontiersin.org/articles/10.3389/fmars.2023.1151810/full.
- Maslow, A. H. (1943). *A theory of human motivation*. Psychological Review, 50(4), 370–396. Retrieved from: www.doi.org/10.1037/h0054346.
- Ministry of Production Peru (2017). *Información institucional*. Retrieved from: www.gob.pe/institucion/produce/institucional.
- Nachrichtenpool Lateinamerika (2022). *Tausende Fischer*innen nach Ölkatastrophe vor dem Bankrott*. Retrieved from: www.npla.de/thema/umwelt-wirtschaft/tausende-fischerinnen-nach-oelkatastrophe-vor-dem-bankrott/.
- Numbeo (n. D.) *Cost of living in Peru*. Retrieved from: www.numbeo.com/cost-of-living/country_result.jsp?country=Peru.
- Paden, N. E. (2007). *Indigenous Knowledge in Peru*. Tribes and Tribals. Special Volume No. 1. Boon, E. K., Hens, L. (Eds.).
- Petza, D. E. (2023). *Contribution of area-based fisheries management measures to fisheries sustainability and marine conservation: a global scoping review*. Fish Biology and fisheries. Springer Link (publ.). Retrieved from: www.link.springer.com/article/10.1007/s11160-023-09780-9.
- Pisupati, B., Subramanian, S. M. (2010). *Conclusion*. Traditional knowledge in policy and practice: Approaches to development and human well-being. Pisupati, B., Subramanian, S. M. (Eds.). United Nations University Press (publ.).

- Pisupati, B., Subramanian, S. M. (2010). *Introduction*. Traditional knowledge in policy and practice: Approaches to development and human well-being. Pisupati, B., Subramanian, S. M. (Eds.). United Nations University Press (publ.).
- Putra, S. A. (2021). *Ethnoscience A Bridge To Back To Nature*. EDP Sciences (publ.).
- Rahim, N. (2020). *Traditional Ecological Knowledge and its Relevance to Sustainable Development*. Somaliland Peace and Development Journal (Vol. 4). Ali, N. M. (Ed.). Institute for Peace and Conflict Studies (publ.).
- Royer, M. J. S. (2016). *Climate, Environment and Cree Observations*. Springer Cham (publ.).
- Rundfunk (2023, March 23rd). *El Niño und La Niña – Wetterphänomene bringen Naturkatastrophen*. ARD Alpha (publ.). Retrieved from: www.ardalpha.de/wissen/umwelt/klima/wetter-el-nino-la-nina-meeresstroemung-wetterphaenomen-100.html.
- The World Bank (1998). *Indigenous Knowledge Definitions, Concepts and Applications*. The World Bank (publ.).
- Vatikan News (2018). *Papst vor Peru-Besuch: Bischof Nann: Peru ist tief gespalten*. Retrieved from: www.weltkirche.katholisch.de/artikel/36785-bischof-nann-peru-ist-tief-gespalten



Institut für Internationale &
Digitale Kommunikation

ISSN 2940-1992