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EXPLORING THE LANDSCAPE OF ONLINE FISH MARKETING: A LITERATURE REVIEW

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Abstract

The purpose of this literature review is to investigate the changing environment of online fish marketing by analysing its drivers, technical enablers, and ramifications for both consumers and producers. Not only does it identify critical obstacles, such as cold chain management, customer faith in freshness, and the digital gap among small-scale fishermen, but it also finds key advantages, such as enhanced market reach and efficiency. An analysis of the data concerning consumer behaviour, regulatory frameworks, and factors of sustainability is presented in this paper. This article intends to give a basic knowledge for future studies and to guide strategic actions in this rapidly emerging industry by addressing the gaps that currently exist in the research that has been conducted.

Key words: *Challenges, Digital marketing, E-commerce, Online fish marketing*

1. Introduction

Global marketplaces have changed due to e-commerce, connecting manufacturers and consumers. This digital shift started with durable commodities and has spread to agri-food, including fish. The conventional fish market, noted for its human contacts and sensory pleasures, is now experiencing internet sales difficulties and benefits. As technology advances, customer behaviours change, and supply networks must become clearer and more efficient (Sharma & Kumar, 2021).

Online fish marketing helps consumers and farmers. Consumers benefit from convenience, variety, and lower pricing. It may expand markets, remove intermediaries, and boost profit margins for producers, especially in remote coastal areas (Gupta & Singh, 2019). Fish's susceptibility to spoilage, temperature variations, and need for tight quality control make it unique among online retail businesses (Rahman & Khan, 2020).

Fish is included of healthy reference diets with plant-based meals. However, less healthy foods are being eaten increasingly. Consumer perceptions of flavour, the ease of unhealthy foods, and their powerful marketing campaigns may explain this tendency. Thus, promoting healthy eating habits like eating fish needs similar effective marketing strategies. Digital technology and the internet have made online marketing popular worldwide including in India. Marketing managers, inspired by data, have seen the need to switch to e-commerce, since half of customers are receptive to buying fish online now or in the future. Despite this promise, fish marketing differs from beef, chicken, and hog marketing. Understanding the potential of online fish marketing requires addressing customer perception, information availability, and the inherent limitations of handling a perishable commodity. This literature review discusses online fish marketing's present state, obstacles, and possible tactics, highlighting major results and topics for additional study.

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This research carefully examines online fish marketing knowledge. We strive to comprehend this expanding subject by examining technology frameworks, customer perspectives, and regulatory issues. The findings will illuminate present patterns and suggest further research and action.

Consumer demands for convenience and efficiency have driven the rapid growth of online fish trading enterprises (Shyam et al., 2025). Online seafood shoppers prioritise taste, price, and freshness (Waghmare et al., 2025; Sharma et al., 2011).

Handling fish requires meticulous cold chain logistics, packaging with insulation and refrigerants, and well-planned shipping routes to maintain freshness and quality throughout travel (Løvdal & Oehme, 2020; BlueCart, 2025). Food safety and seafood fraud prevention need extensive testing and inspection (TÜV SÜD, 2025; IBM, 2024). Clear sourcing is becoming more important as consumers are willing to spend more on seafood that can be tracked. Online platforms may reduce middlemen and raise ex-vessel pricing for fishermen, improving their incomes and market access (EI Publication, 2025). Digital solutions for small-scale fishers boost socioeconomic effect.

IoT, AI, and data analytics provide real-time monitoring, better feeding, and better traceability in the fisheries sector (EssFeed, 2025; Kishore et al., 2023). AI-powered recommendations may improve shopping experiences and sales, while AI in aquaculture management improves fish quality and availability (Kishore et al., 2023; EssFeed, 2025).

Online fish companies need solid e-commerce (Carlucci et al., 2015; Foxall, 2018). Convenience, payment alternatives, and incentives are used to build consumer loyalty (Scribd, 2025). Social media marketing boosts company awareness and sales with engaging content and testimonials (Faako Aquaponics, 2025). Off-season availability and price changes need flexible pricing and sourcing (Scribd, 2025).

Trust in online seafood transactions depends on precise information regarding origin, handling, and delivery (Local Line, 2025). Provide exceptional client service and keep communication open to build trust. Fresh, frozen, and value-added products attract more consumers (Local Line, 2025).

The competitive environment necessitates unique value propositions and differentiation tactics (Scribd, 2025). The COVID-19 epidemic accelerated online seafood purchases (Liu et al., 2021). B2B online fish marketplaces, sustainable aquaculture, and blockchain for traceability are expected to grow (EI Publication, 2025; EssFeed, 2025). Online food enterprises in India must follow FSSAI laws (FSSAI, 2025). Fair employment and ethical fishing are becoming increasingly important to customers. In addition, India's Pradhan Mantri Matsya Sampada Yojana (PMMSY) helps the fishing industry become digital (Press Information Bureau, 2025). Addressing the digital gap among small-scale fishers is crucial to success. Finally, customer worries about cyber security and data privacy need effective online fish shop security (Advantage, 2025).

Factors Behind Online Fish Marketing

The literature on online fish marketing can be broadly categorized into several thematic areas, reflecting the multidisciplinary nature of the subject.

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E-commerce Adoption in Agri-food and Perishable Goods

Early research on the adoption of e-commerce within the wider agri-food sector established a foundation for grasping the possibilities and obstacles associated with perishables. Smith and Jones (2018) emphasised the potential of online platforms to broaden the market access for agricultural products, transcending conventional geographic limits. Lee et al. (2020) illustrated the benefits and savings that can be realised through online sales directly to consumers for a range of food products. However, these studies often recognised the distinct challenges related to freshness and shelf-life, paving the way for more focused research.

Supply Chain Digitization and Cold Chain Management

A lot of research emphasises the innovations needed for managing perishable items in the online space. Chen and Wang (2021) explored how IoT (Internet of Things) and blockchain technology can improve traceability and transparency in cold chains for seafood, suggesting that these innovations could foster consumer trust. Kumar and Singh (2019) highlighted the essential role of strong logistics infrastructure, especially refrigerated warehousing and transport, in reducing post-harvest losses in online fish distribution. Research delves into creative packaging options and continuous temperature tracking to maintain product quality throughout transportation (Gupta & Bose, 2020).

Consumer Behavior and Trust in Online Fish Purchases

Understanding the factors that motivate consumers to purchase fish online, as well as the barriers that hold them back, is an important focus. Garcia and Rodriguez (2022) discovered that ease of access and attractive pricing were key factors driving online seafood purchases, particularly among younger consumers. Nguyen and Kim (2020) pointed out that the perception of freshness, sensory qualities (which are challenging to evaluate online), and information about the product's origin played essential roles in driving repeat purchases and overall satisfaction. Establishing trust through certifications, clear sourcing, and dependable delivery services has become essential strategies (Dubey & Sharma, 2023).

Challenges for Small-Scale Producers and Market Access

The shift to online platforms presents unique hurdles for traditional fishers and small-scale aquaculture farmers. Patel and Devi (2017) examined the divide in digital literacy and the limited access to technology, such as smartphones and internet connectivity, that hinders numerous rural fishers from engaging directly in online markets. Abebe and Getahun (2019) explored how intermediary aggregators can help small producers access markets while also highlighting issues related to fair pricing and potential dependency. There is a consistent emphasis on the importance of enhancing skills, providing education, and developing collaborative marketing strategies for these producers (Fisheries Development Journal, 2018).

Regulatory Frameworks and Sustainability Implications

As online fish marketing evolves, so does the necessity for flexible regulatory frameworks. Johnson and Davis (2023) explored the intricacies of implementing food safety standards and labelling requirements for seafood available online in various jurisdictions. The Fisheries Management Institute (2020) released a report highlighting the importance of regulations that guarantee traceability to responsible fishing practices, aiming to curb illegal, unreported, and

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unregulated (IUU) fishing via online platforms. Green and Eco (2022) examined the possible positive impacts of online platforms on the environment, highlighting reduced food waste from direct sales and improved logistics. However, they also warned about the risks of increased packaging waste and a larger carbon footprint resulting from personalised deliveries.

2. Problem Statement

Despite the rapid spread of e-commerce into other food sectors, online marketing of fresh and processed fish poses unique and difficult challenges that are not yet generally identified or addressed in the literature. The natural perishability of fish requires strong cold chain management, detailed logistical planning, and strict quality assurance measures, which are often lacking in many areas (Das & Chatterjee, 2018). However, market access, decreased post-harvest losses, and price optimisation are significant benefits. Consumer trust in the freshness, provenance, and safety of online-purchased fish remains a key barrier to acceptability (Lee & Kim, 2019). Traditional small-scale fishermen' digital literacy and access to technology may widen the gap between market possibilities and at-risk populations (Ahmed & Hassan, 2020). Online seafood transactions are complicated, therefore regulatory regimes sometimes have ambiguous criteria and uneven enforcement (Patel & Singh, 2022). Thus, a shared understanding of these complicated concerns is essential for sustainable and equitable online fish marketing growth.

Table:1 Articles related to the Study

Sl.No.	Articles	Methods Used	Objectives
1	Shyam et.al. (2018)	Analysis of online fish trade in Ernakulam district Assessment of various aspects related to online firms	Analyze factors affecting online fish trading firms. Identify constraints faced by online fish marketing firms.
2	Lis (2024)	Digital marketing for fisheries industry products in Indonesia Advantages of online marketing for fishery commodities	Study digital marketing of fisheries products in Indonesia. Increase public knowledge of Information and Communication Technology (ICT).
3	Anggi et.al. (2023)	Digital marketing strategies for catfish farming Utilizing digital platforms for business	Increase sales and brand awareness of catfish farming. Utilize digital platforms for business
4	Lennox et.al. (2022)	Social media data scraping Integrated use of multiple data sources	Integrate digital fisheries data in research and management. Facilitate adoption of digital data approaches in fisheries.
5	Gladju et.al. (2022)	Data mining and machine learning framework for intelligent decision-making solutions. Applications in aquaculture and fisheries sectors with practical examples.	Discuss practical applications of data mining and machine learning. Present challenges and future perspectives in aquaculture and fisheries.
6	Maulana (2024)	Mixed-methods approach combining qualitative and quantitative data collection. In-depth interviews and surveys	Investigate online marketing transformation of culinary MSMEs in Karawang. Explore strategies, challenges, and

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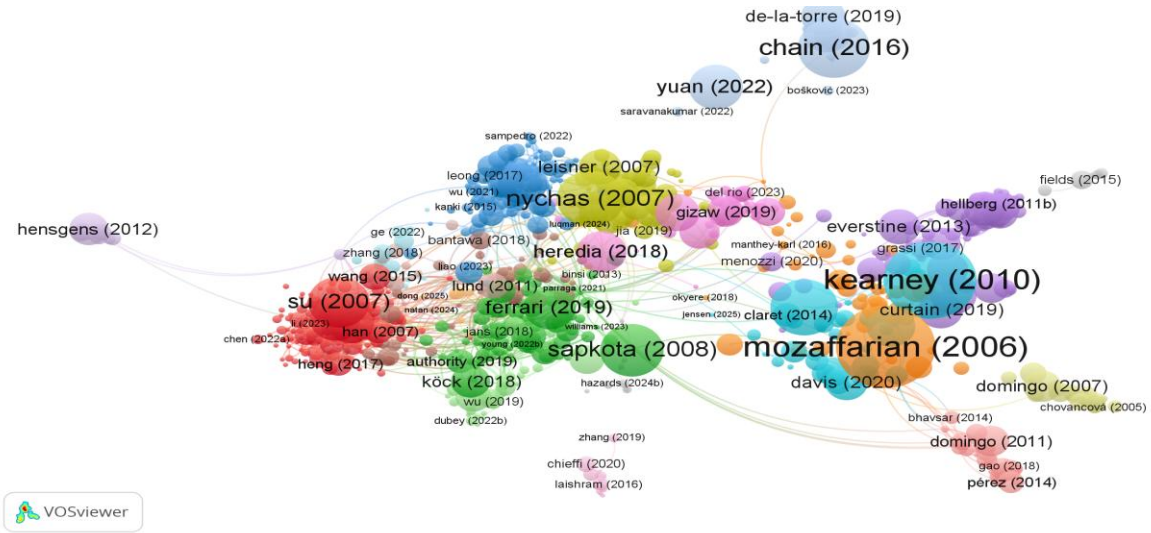
Sl.No.	Articles	Methods Used	Objectives
7	Sulkiah (2023)	Data collection through questionnaires distributed to 171 fishermen. Statistical analysis using descriptive analysis and linear regression.	Determine effect of digital marketing content on sales. Analyze accuracy of media selection on sales outcomes.
8	Chang (2020)	Analyzing successful cases of e-commerce platforms. Suggestions for constructing aquatic product sales platforms.	Analyze successful e-commerce platform cases for aquatic products. Suggest improvements for ocean aquatic product sales platforms.
9	Christiana et.al. (2022)	Inductive research approach with qualitative and quantitative data Survey through online questionnaire and systematic review of articles	Explore marketing strategies for UK fish farming businesses. Identify ways to gain competitive advantage in the market.
10	Abidin & Triono (2020)	Analysis of Structural Equation Modeling Distribution of online questionnaires	Analyze marketing mix effects on buying interest and decisions. Assess customer satisfaction in e-commerce for Silly Fish Indonesia.

BIBLIOGRAPHIC ANALYSIS

Research front Bibliographic assists in uncovering the leading edge of a field, illustrating how the research literature within that area is being structured by its authors. One benefit of bibliographic coupling is that it allows for the discovery of conceptual links between publications that may not have been cited yet due to their recent nature. Consequently, we chose not to establish any minimum requirement for the number of keywords needed to generate the bibliographic analysis map presented in Figure 1. In this depiction, the dimensions of a node correspond to the quantity of keywords acquired by the publication on a global scale. A connection between two nodes indicates that the keywords associated with both nodes share common references. Their keyboard strength increases with the number of citations to other documents they share. The publications were grouped into various clusters. The hue of the node indicates the grouping of the publication. A review of the primary subjects addressed, the references, and the progression of the publications within each group is presented below:

Figure: 1. Bibliographic Mapping



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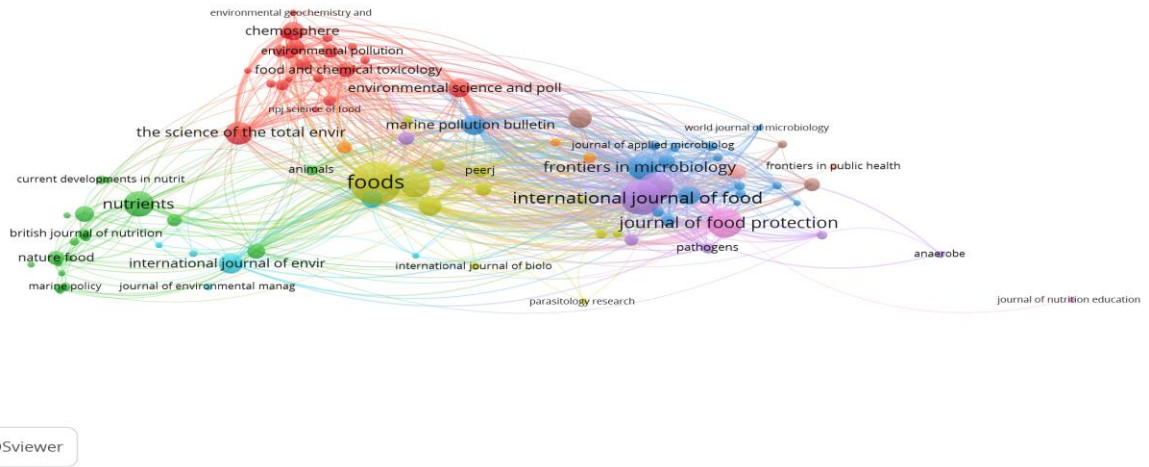
This VOS viewer-generated bibliometric network visualisation shows academic reference connections (primarily authors and publishing years). This visualisation shows that Each colour reflects a cluster of bibliographically connected various authors—co-citations, collaborations, or common study themes. Large clusters like green, orange, and blue suggest extensive intellectual networks where authors or articles are frequently referenced.

Greater nodes (author/year) have a greater influence or frequency of citation in the analysed literature collection. Large nodes like Mozaffarian (2006) and Kearney (2010) are important. Their clusters include renowned writers including nychas (2007), sapkota (2008), curtain (2019), and ferrari (2017). Lines (edges) link commonly referenced scholarly writers. Shorter distances increase co-citation frequency. Interconnected clusters may reflect multidisciplinary or collaborative themes. Nodes like hensgens (2012) and de-la-torre (2019) are further apart, indicating specialised, less central research fields or isolated research pathways. Inter-cluster nodes like gizaw (2019) and heredia (2018) commonly connect key research streams.

The colours indicate themes. Given author names like sapkota (2008) and ferrari (2017), the huge green cluster may represent food safety or environment research, whereas orange or blue clusters may reflect related but separate topics. The labels' years indicate each topic's academic development or peak years. Research is shaped by highly cited authors and papers like Mozaffarian 2006 and Kearney 2010. Clusters represent thematic or collaborative groups, and link density indicates their collaboration. Niche or developing themes are indicated by marginal writers (Hensgens 2012). This map shows research trends, significant papers, and academic dialogue in the linked literature.

Figure:3. Co-citation Network related to Online Fish Marketing



VOS viewer developed this network graph showing the linkages and citation patterns of prominent academic publications in food science, nutrition, public health, environmental science, and allied topics. Journal clusters are colour-coded to show topic or disciplinary relationships. Chemosphere, Environmental Pollution, and The Science of the Total Environment are environmental science and pollution journals. Nutrients, British Journal of Nutrition, and Nature Food publish nutrition and food science articles. Yellow/central cluster: Foods, a core node, suggests significant multidisciplinary ties in food safety, processing, and technology. Right blue and purple clusters:

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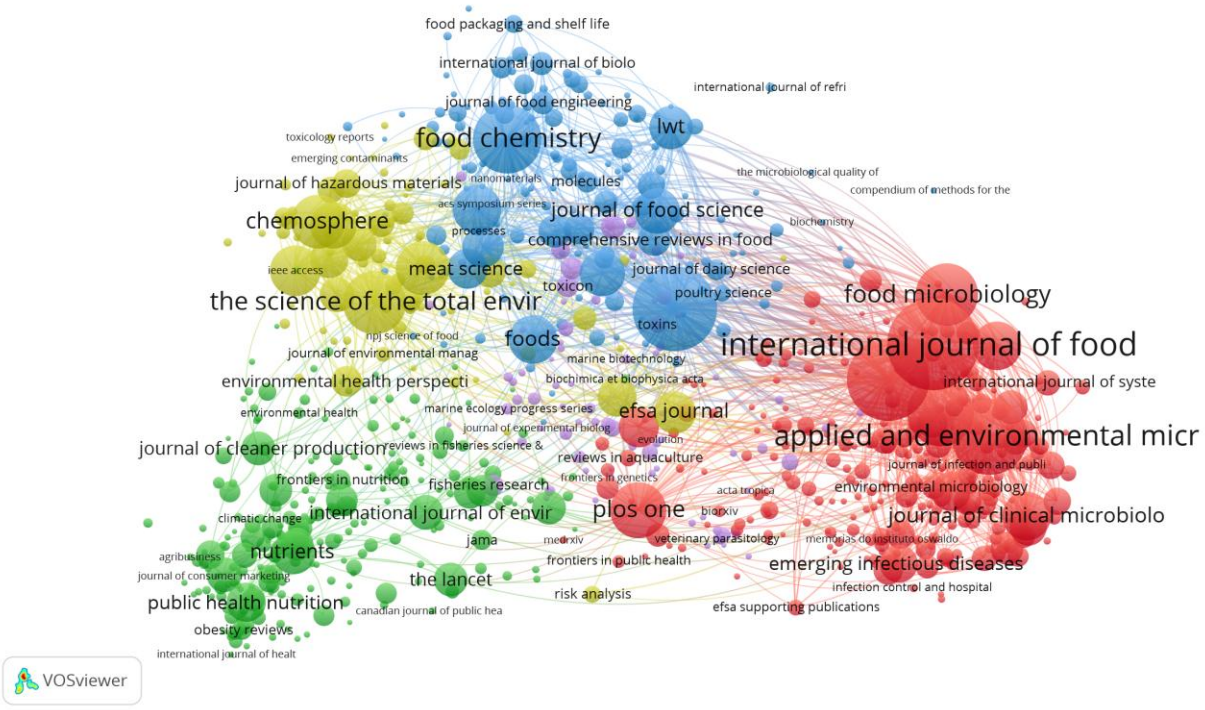
Frontiers in Microbiology, Journal of Food Protection, and International Journal of Food include microbiology, public health, and food protection.

Larger nodes indicate publications with more citations or references in the study topic, indicating their relevance in the academic network. Nodes with strong connections or near positions indicate journals that quote each other or share study themes. Multidisciplinary food research intersects with microbiology, public health, and environmental science, resulting in highly interwoven clusters around publications like Foods, International Journal of Food, and Journal of Food Protection. Journal of Nutrition Education and Anaerobe are speciality journals with niche links to the main network. These may be subfields or new research subjects with less cross-disciplinary linkages. The map shows which publications and subjects are often linked, notably in food, health, and environmental safety research. As multidisciplinary centres, journals like Foods link various research groups. Clusters collaborate and cite often in nutrition, microbiology,

Figure: 4. Co-citation Analysis – Intellectual Base



The VOS viewer-generated network map shows the links between scientific publications based on co-citation or co-occurrence of phrases in a field. The numerous clusters and their interactions reveal the research landscape's topic structure and multidisciplinary character. Right Side Red Cluster (Microbiology and Food Safety): The significant cluster comprises "Food Microbiology," "International Journal of Food," "Applied and Environmental Microbiology," and "Journal of Clinical Microbiology." This suggests an emphasis on infections, spoilage, and public health in food, food safety, and environmental microbiology.Yellow Cluster (Left Side - Environmental Science and Toxicology):

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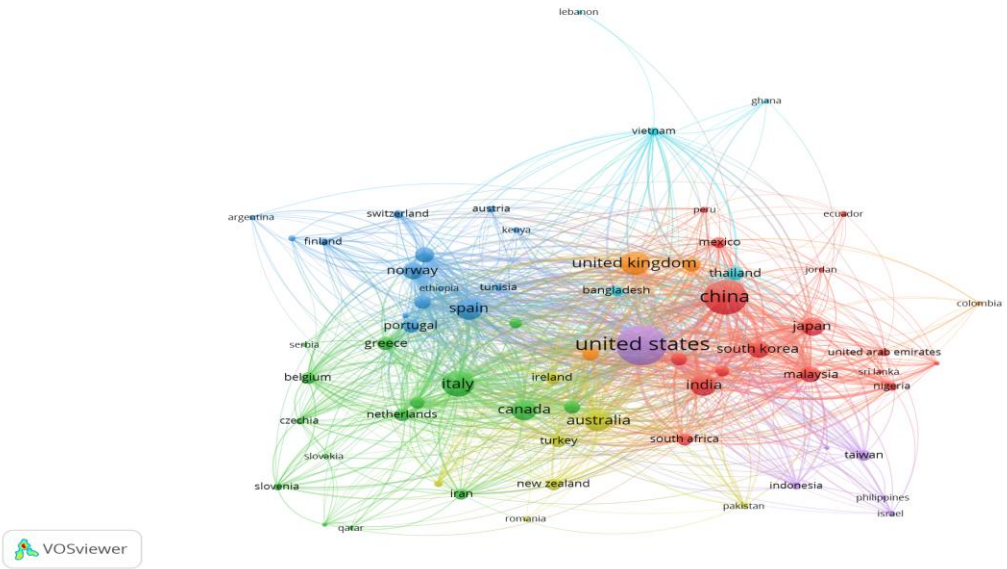
"Chemosphere," "The Science of the Total Environment," "Environmental Health Perspectives," and "Journal of Hazardous Materials" are involved. Research on environmental pollution, pollutants, and toxicology is included.

Blue Cluster (Top/Center - Food Chemistry and Technology): "Food Chemistry," "IWT," "Journal of Food Science," "Meat Science," and "Journal of Food Engineering" dominate. This cluster studies food chemical composition, processing, engineering, and quality. The green cluster (bottom left) includes "Nutrients," "Public Health Nutrition," "British Journal of Nutrition," "International Journal of Environmental Research and Public Health" (partially visible), and "The Lancet" (a general medical journal with nutrition relevance). This cluster includes nutrition, diet, and public health research. Journal node size denotes importance or frequency in the analysed dataset. Larger nodes like "Applied and Environmental Microbiology," "Food Chemistry," "The Science of the Total Environment," and "International Journal of Food," suggest these journals are highly influential or frequently cited in their fields and in this network.

Journal lines show co-citation or thematic ties. The density and thickness of these lines reflect connection strength. Inter-cluster linkages, especially between the "Foods" node (centre, linking yellow and blue clusters) and the red cluster, show food research's multidisciplinary character. Food chemistry (blue) studies typically interact with food microbiology (red), and environmental issues (yellow) might affect food safety. Journals like "EFSA Journal" (European Food Safety Authority) bridge food safety, chemistry, and policy, exhibiting their vast breadth.

The arrangement is very interconnected, notably around important publications like "Foods," "Journal of Food Science," and "Comprehensive Reviews in Food Science." This emphasises the multidisciplinary aspect of food, health, and environmental studies. The terms "toxins" and "pathogens" connect food chemistry, environmental science, and microbiology. This network graph shows the main themes and their relationships in a huge food, environmental, and health research literature. It lists the top publications in each discipline and shows how food chemistry, microbiology, toxicology, nutrition, and environmental studies are interconnected.

Figure:5. Bibliographic Coupling Analysis Worldwide



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This VOSviewer-generated network map shows country cooperation tendencies in a research topic or across all scientific publications. Links between countries reflect scientific partnerships (e.g., co-authored papers).

The map shows groupings of nations with strong cooperative relationships, each coloured differently. Red/Orange Cluster (Centre-right): US, China, India, Japan, and South Korea dominate. Global scientific cooperation is concentrated in this cluster, especially in Asia and North America. The U.S. and China's major nodes emphasise their importance.

The Green Cluster (Centre-left) includes Italy, Spain, Netherlands, and Germany (possibly embedded even without a big node). It represents significant intra-European scientific links, extending to Canada and Australia.

Norway, Finland, Sweden (presumably included), and Switzerland are in the blue cluster on the left. This cluster may be a Nordic/Northern European research bloc. This cluster includes Vietnam, Ghana, Peru, and Mexico, indicating interactions between underdeveloped states or countries with regional research interests. Purple/Violet Cluster (Bottom-Right): Southeast Asian research network including Taiwan, Philippines, and Indonesia.

The dataset's research output or cooperation frequency determines each country's node size. The US has the biggest node, followed by China, reflecting their worldwide research and cooperation leadership. Other major contributors include the UK, India, Italy, and Canada. Edges across nations signify collaboration. Line thickness usually reflects cooperation intensity or frequency. U.S., China, India, and Japan collaborate extensively, as seen by the red/orange cluster's dense line network.

More nations cooperate or share research interests when they are closer together. European states are tightly clustered, indicating considerable regional collaboration. The network's hubs, the US and China, link numerous clusters. They collaborate on international research in several locations. Lebanon is isolated in this dataset, suggesting less direct international interactions or specialised research fields with few worldwide collaborators.

This network diagram shows the complex worldwide research partnerships. The VOS viewer program found over 15 clusters in the mapping of all themes (red, dark green, blue, dark yellow, dark purple, Tosca, orange, brown, light purple, pink, green, light grey, cream, violet, and light Tosca). The clusters exhibited topic relationships. Strong subject areas or keywords were indicated by connecting line thickness. In addition to clusters and lines, node size reflected keyword or subject frequency. Figure 1 shows scientific literacy, information literacy, human, and female as the top keywords. Nodes or keywords without a network might become future study subjects.

5. Criticisms (Challenges and Barriers)

Online fish marketing is intriguing, but studies have shown considerable drawbacks and obstacles. First, fish perishability is the biggest challenge. For quality and safety, the cold chain must be intact from harvest to customer. Spoilage and customer distrust occur in many places, particularly developing ones, due to inadequate chilled transport and storage facilities (Wang et al., 2019; Kumar & Singh, 2018).

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Consumer scepticism about freshness and quality is widespread. Online transactions depend on vendor trust and transparency, unlike traditional marketplaces where buyers can see, touch, and smell the fish (Chen & Li, 2020). Garcia and Lopez (2021) found that visual signals and thorough product descriptions are necessary but inadequate to overcome in-person rating preferences. Third, traditional small-scale fishermen face digital divide and digital literacy issues. Many distant fishing villages lack internet connectivity, cellphones, or online platform capabilities, restricting their involvement in contemporary supply chains (Ali & Rahman, 2017). Since bigger aggregators dominate online, this might marginalise rather than empower. In crowded urban or poorly populated rural locations, last-mile delivery issues add significant logistical complexity beyond the cold chain. Complex logistical networks are needed to manage perishable delivery schedules, execute orders, and handle returns and complaints (Nguyen & Tran, 2019).

Finally, regulatory issues and unstandardised rules complicate matters. Online seafood food safety, traceability, and cross-border commerce legislation might be unclear or vary widely (Johnson & Davis, 2023). Online fish selling platforms may struggle to scale and internationalise due to this fragmented regulatory framework (Fisheries Policy Review, 2021). Socioeconomic issues such employment displacement and conventional market livelihoods must be considered (Economic Commission for Asia, 2020).

6. Discussions

The literature shows a dynamic and expanding online fish marketing environment with huge promise and major challenges. Due to customer desire for convenience and industrial efficiency, seafood supply chains will eventually become digitised (Sharma & Kumar, 2021). Fish is a perishable item, therefore online models depend on strong technical integration and logistical innovation, especially in cold chain management and traceability (Chen & Wang, 2021; Kumar & Singh, 2019). Platforms must ensure freshness and safety to build customer trust, a major psychological hurdle to adoption (Nguyen & Kim, 2020; Dubey & Sharma, 2023). Regularly, large-scale commercial companies have more access and capacity than small-scale traditional fishermen.

Online platforms provide the latter access to new markets, but the digital divide and lack of physical and digital infrastructure sometimes prevent their direct involvement (Patel & Devi, 2017; Ali & Rahman, 2017). This raises important considerations about equality and inclusion in the digital economy, recommending legislative interventions and cooperative models that empower disadvantaged populations rather than marginalise them.

Technology advances faster than regulation. Standardised food safety measures, unambiguous online labelling regulations, and sustainable sourcing monitoring across varied internet channels are still emerging (Johnson & Davis, 2023; Fisheries Management Institute, 2020). The relationship between environmental sustainability (e.g., decreased waste, efficient logistics) and possible drawbacks (e.g., higher packaging, cold chain energy consumption) should also be examined (Green & Eco, 2022).

Empirical studies on the long-term economic and social effects of internet platforms on diverse fishing communities, particularly in different regions, are needed. Further research on consumer behaviour for various fish and processed goods, taking into account cultural preferences and buying patterns, is needed. Innovative business models that overcome cold chain gaps and build confidence, such as community-supported fisheries with online components or

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blockchain-enabled transparency for small farmers, are promising. For online fish marketing to thrive, study into the best legislative and regulatory frameworks for growth, food safety, environmental sustainability, and fair market access is essential.

7. Conclusion

The realm of online fish marketing is growing swiftly, influenced by advancements in technology and changing consumer habits. This literature review has revealed the remarkable ability of e-commerce to broaden market access and improve supply chain efficiencies within the seafood sector. Nonetheless, it highlights the important challenges that need attention, especially regarding the preservation of a strong cold chain, fostering and maintaining consumer confidence in product quality, and closing the digital gap that leaves many small-scale producers at a disadvantage.

The success and enduring growth of online fish marketing will rely on a collaborative approach that includes technological innovations, thoughtful policy creation, and focused skill development for all involved parties. By recognising and tackling the challenges that have been identified, especially those concerning infrastructure, trust, and fair access, online platforms can genuinely transform the process of bringing fish from water to plate. This transformation can benefit both producers and consumers while also fostering more sustainable practices. Ongoing exploration, particularly practical studies rooted in various local contexts, will be essential in shaping this development.

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