



## THE IMPORTANCE OF ELECTRONIC LIBRARIES (E-LIBRARIES) IN FISHERIES MANAGEMENT: A CRITICAL REVIEW

By

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### Abstract

*This article provides a critical review of the importance of electronic libraries (e-libraries) in fisheries management. E-libraries offer several benefits, including improved access to information, increased efficiency, and enhanced collaboration among stakeholders. The article highlights examples of e-libraries being used in fisheries management, such as the FAO E-Library and IAMSLIC. It also discusses challenges and limitations, including access to technology and the digital divide. The article concludes that e-libraries are an important tool in fisheries management and recommends increased investment in digital infrastructure, improved access to information, and collaboration and knowledge-sharing among stakeholders.*

**KEYWORDS:** E-libraries, Fisheries Management, Knowledge Sharing, Digital Infrastructure, Sustainable Fisheries

## INTRODUCTION

The fisheries sector is a significant contributor to Nigeria's economy, providing employment and income for millions of people (NBS, 2020). The sector has been undergoing significant changes in recent years, driven by the advent of ICT (OECD, 2020). ICT has transformed the way the fisheries industry operates, bringing about both opportunities and challenges (World Bank, 2020). According to Akerele (2018), ICT has improved access to information, enhanced market access, and increased efficiency in the fisheries sector.

In today's technology driven world, traditional libraries are getting a high-tech upgrade called e-libraries. E-libraries are like super libraries on the Internet that anyone can use. They have lots of different materials to read and learn about, making knowledge accessible to everyone. With e-libraries, you do not have to worry about late fees or going to a physical library, it is all online business! Nevertheless, they make learning fun with cool features like pictures and videos. These digital libraries are not just helpful but also eco-friendly, saving paper and protecting the environment. E-libraries are crucial for effective fisheries management by providing accessible, up-to-date information for research, policymaking and sustainable practices. They offer a centralized platform

for accessing a wide range of resources, including scientific literature, data, and best practices, which are essential for informed decision-making in the fisheries, sector (WorldFish, 2020; Dada, 2021).

Fisheries management is a complex and multifaceted field that requires access to a vast array of information, including scientific research, policy documents, and technical reports. In recent years, the use of electronic libraries (e-libraries) has become increasingly important in fisheries management, providing stakeholders with a convenient and efficient way to access relevant information. This article provides a critical review of the importance of e-libraries in fisheries management, highlighting their benefits, challenges, and potential applications.

Several studies have examined the impact of ICT on fisheries career development in Nigeria. A study by Ojo (2019) found that ICT has improved access to information and enhanced market access for fisheries entrepreneurs. Similarly, a study by Udoh (2020) found that ICT has increased efficiency and facilitated capacity building in the fisheries sector. However, a study by Eboh (2018) noted that the adoption of ICT has also raised concerns about dependence on technology and cybersecurity risks.



According to a report by the World Bank (2020), ICT has the potential to transform the fisheries sector, but its adoption should be carefully managed to minimize the risks and maximize the benefits. The report recommends that the government, private sector, and development partners work together to provide infrastructure, training, and support to ensure that the benefits of ICT are shared equitably among all stakeholders. ICT has been increasingly adopted in the fisheries sector in Nigeria, with various applications in fish farming, fishing, and fish processing (Akerlele, 2018). The use of ICT has improved access to information, enhanced market access, and increased efficiency in the fisheries sector (Ojo, 2019).

## Objectives of the Study

The objectives of the article are to highlight the importance of e-libraries to fisheries management which likely include:

Enhancing Access to Information, Improving Knowledge Sharing, Supporting Evidence-Based Management, Capacity Building and Promoting Sustainability.

The importance of e-libraries in fisheries management can be discussed in the following points:

### Informed Decision-Making

E-libraries offer fisheries managers and policymakers access to up to date research and data, enabling informed decisions. For instance, the Food and Agriculture Organization (FAO) of the United Nations' e-library provides access to fisheries and aquaculture resources, supporting informed decision-making (FAO, 2018).

### Improved Fisheries Governance

They facilitate knowledge sharing and collaboration among stakeholders, promoting good governance and sustainable fisheries management. The World Bank's e-library provides access to fisheries and aquaculture resources, supporting improved governance (FAO, 2018).

### Enhanced Research Capacity

E-libraries provide researchers with access to global research, enhancing their capacity to contribute to fisheries science and management. For example, the National Oceanic and Atmospheric (NOAA) Fisheries e-library offers research, data, and management tools, supporting research capacity (Emery *et al.*, 2019; NOAA, (n.d)).

### Increased Transparency and Accountability

E-libraries make fisheries data and research more accessible, promoting transparency and accountability in fisheries management. The FAO's Global Information System (FIGIS) provides access to fisheries data, promoting transparency (FAO, 2018).

### E-Libraries Support Sustainable Fisheries Management

E-libraries provide access to best practices and research on sustainable fisheries management, supporting the development of sustainable fisheries policies. The Marine Conservation Institute E-library provides access to research and best practices on marine conservation and sustainable fisheries management (FAO, 2017; Salunkhe & Patil, 2018).

### Convenience of E-Libraries

Think about a time when bursting with curiosity, eager to dive into a book or study, but the library is too far away. No need to worry: e-libraries are like digital magic doors that swing open from anywhere in the world, as long as you have the Internet. Whether you are chilling at home, navigating through school, or soaking up the sun on vacation, a treasure trove of information awaits you (Ibeun, 2020).

### Abundance of Knowledge

E-libraries are like virtual treasure chests, overflowing with all sorts of cool stuff. From digital books to fascinating articles, entertaining videos, and more, these online treasure troves have something for everyone. It's like having a gigantic online store filled with knowledge, just waiting for you to explore and uncover hidden gems (FAO, 2020).

### Limitless Learning Budget

Remember those times you got in trouble for returning library books late? Say goodbye to those worries. Hence, e-libraries do not only save you money on bus rides to the library but also spare you from those pesky late fees. It is like winning a jackpot – you get access to knowledge without putting a dent in your pocket (FAO, 2019).

### Fun-Filled Learning with E-Libraries

E-libraries turn learning into a thrilling adventure. They are not just about reading plain words on a screen. Oh no, they bring in the fun with pictures, videos, and super quick ways to find what you are looking for. Learning becomes not only educational but also super exciting and entertaining (Balaji *et al.*, 2023).

### Maximize Time Efficiency

In a world where time seems to fly, e-libraries are like time-traveling-wizards. No more wandering through library shelves for hours on end. With just a few taps on your keyboard, you can find exactly what you are searching for – a quick and easy way to get the information you need without the time-consuming hunt (Rafi *et al.*, 2019).

### Environmental Heroism of E-Libraries

E-libraries step up as eco-warriors, fighting for our planet. It is by using less paper and needing less transportation. Choosing e-libraries means you are not just learning; you are also helping to take care of our Earth. It is like being a superhero for the environment pretty awesome. Studies on the carbon footprint reduction of digital libraries verse tradition libraries are a concern on environmental health and pollution (Mohan, 2005).

### Friendship and Learning in E-Libraries

Ever dreamed of working on a project with friends who live far away. E-libraries make that dream a reality. You can share cool discoveries, chat about them, and even work on projects together as if you are all in the same room. It is like having a virtual study group, connecting friends from all corners of the globe (Shiffman, 2018).

### Embracing Continuous Learning with E-Libraries

E-libraries are likewise old mentors, always in the know about the latest gadgets and tech tricks. They make sure you have

access to the newest and coolest tools while you are learning. It is like having a tech-savvy friend who guides you through the wonders of the digital world (Eboh, 2018).

## BENEFITS OF E-LIBRARIES IN FISHERIES MANAGEMENT

Some key benefits of e-libraries in fisheries management:

- **Improved Access to Information:** e-libraries reduce geographical barriers, providing researchers, policymakers, and others stakeholders with access to a vast collection of fisheries related information, including research papers, reports and data (Hjorland, 2017; Udoh, 2020; Ojo, 2019; Ojo *et al.*, 2020).
- **Enhanced Research and Development:** By providing access to a wide range of scientific literature and data, e-libraries support research in areas like stock assessment, aquaculture and sustainable fishing practices.
- **Informed policymaking:** e-libraries provide policymakers with the evidence based information needed to develop and implement effective fisheries management strategies, promoting sustainable resource use and conservation (Blue Solutions *et al.*, 2018).
- **Promotion of sustainable practices:** access to best practices, case studies, and technological advancement through e-libraries can help promote sustainable fishing methods and reduce overfishing.
- **Cost and Space Efficiency:** e-libraries reduce the need for physical storage of books and documents, saving costs and space associated with traditional libraries (Tenopir & King, 2000; Akerele, 2018).
- **Dissemination of Information:** E-libraries facilitate the dissemination of information to a wider audience, including local communities, through online platforms and outreach programmes.
- **Support for Aquaculture Development:** E-libraries can play a significant role in aquaculture research and development by providing access to information on breeding, feeding, disease management, and other relevant topics.
- **Combating Illegal fishing:** Digital data from e-libraries, combined with technologies like Global Positioning System (GPS) and remote sensing, can help monitor fishing activities and combat illegal, unreported and unregulated fishing (IUU), according to some research papers.
- **Monitoring and Evaluation:** E-libraries can be used to collect and analyze data on fishing activities, catch levels and environmental conditions, supporting monitoring and evaluation efforts (Ruiz *et al.*, 2019).

## ROLE OF E-LIBRARIES IN SUPPORTING SUSTAINABLE FISHERIES MANAGEMENT

E-libraries play a significant role in supporting sustainable fisheries management by providing access to scientific research, management tools, and best practices. Here are key aspects:

- **Access to research and data:** E-libraries offer a vast collection of fisheries research, including journals, reports, and datasets, enabling informed decision-making.
- **Knowledge sharing and collaboration:** Online platforms facilitate knowledge sharing among fisheries managers, researchers, and stakeholders, promoting collaboration and innovation (National Research Council, 2002).
- **Capacity building and training:** E-library provides access to educational resources, training materials, and workshops, enhancing the skills of fisheries professionals (Okeke-Ogbuafor *et al.*, 2023).

**Some notable examples include:**

- The Food and Agriculture Organization (FAO) of the United Nations' e-library, which provides access to fisheries and aquaculture resources (SEAFDEC, 2020).
- The National Oceanic and Atmospheric Administration (NOAA) Fisheries e-library (NOAA, 2022), offering research, data and management tools (NOAA. n.d.).

## APPLICATION OF E-LIBRARIES IN FISHERIES MANAGEMENT

Strengthening fisheries management starts with better data, collaboration and inclusive dialogue (World Fish, 2025). E-libraries have numerous applications in fisheries management, including:

- **Access to scientific research:** E-libraries provide fisheries managers and researchers with access to scientific research and data, informing management decisions.
- **Management tools and guidelines:** E-libraries provide access to management tools and guidelines, such as fisheries assessment and management frameworks (Omeluzor & Oyovwe-Tinuoye, 2016).
- **Fisheries data and statistics:** E-libraries offer access to fisheries data and statistics, supporting fisheries management and research.
- **Capacity building and training:** E-libraries support capacity building and training for fisheries professionals, enhancing their skills and knowledge.
- **Best practices and case studies:** E-libraries share best practices and case studies on sustainable fisheries management, informing management approaches.
- **Aquatic resource management:** E-libraries facilitate access to information on aquatic ecosystems, water

quality, and biodiversity, informing management practices (Ibikunle *et al.*, 2025; Cochrane & Garcia, 2009; Kapinga & Msuya, 2018).

## EXAMPLES OF E-LIBRARIES IN FISHERIES MANAGEMENT

- FAO Fisheries and Aquaculture e-library (FAO, 2022).
- NOAA Fisheries e-library (NOAA, n.d).
- World Fish e-library
- Fisheries Global Information System (FIGIS)
- Marine Conservation Institute E-Library
- The International Association of Aquatic and Marine Science Libraries and Information Centers (IAMSLIC) (IAMSLIC, 2022).

## NATIONAL INSTITUTE FOR FRESHWATER FISHERIES RESEARCH (NIFFR)

The National Institute for Freshwater Fisheries Research (NIFFR) was founded in 1968. Its initial mandate was to carry out multidisciplinary activities on the Kainji Lake and other man-made lakes in Nigeria, including: fisheries, wildlife, aquaculture, limnology, public health, and sociology, economics, and range management. In 1987 the mandate was changed by government to cover single commodity and research activities centered on freshwater fisheries and aquatic resources in Nigeria. The mandate is executed by the following technical divisions: Environmental Studies, Artisanal Fisheries, Aquaculture, Biotechnology, Fisheries Technology, Socio-Economics and Extension Services. The support divisions are: Library, Information, Documentation, Finance, Supply and Administration. There are over fifty research scientists at NIFFR. NIFFR interacts with NGOs such as the fishermen associations in the area of extension services. For this purpose, NIFFR has a well-established outreach programme. The activities include visits to fish farm sites to provide advice and training. For example, in recent years, many fish farmers have been trained in the production of indigenous zooplankton as a starter diet for fish to replace the imported *Artemia* (Ibikunle *et al.*, 2025).

Attached to the major research institution for freshwater fisheries in Nigeria, NIFFR Library is responsible for providing access to information in all areas relevant to the sector. The primary users are the research and development staff of the Institute but because of the poor library collections elsewhere, in reality it serves the whole country. The major categories of users are researchers and students with only indirect contact with the fishing communities themselves. Usually this takes the form of providing extension publications to the cooperatives, associations and other NGOs. One can frankly say that access to information in Nigeria is not only time-consuming but also very expensive (Ibeun, 2004; Ibikunle *et al.*, 2025).

## CHALLENGES AND LIMITATIONS ASSOCIATED WITH E-LIBRARIES IN FISHERIES

E-libraries face significant challenges including poor Internet connectivity, high set-up and maintenance costs, inadequate ICT infrastructure, and limited digital literacy among users. Limitations also include the digital divide, lack of standardized, easily accessible resources, and complex copyright management (Agbo, 2022; Nwosu & Obiano, 2021; Oband *et al.*, 2024; Agbo, 2022).

These are some of the challenges and limitations of e-libraries in fisheries management, thus:

**Infrastructure and Technical Issues:** Poor, inconsistent, or lack of Internet connectivity are bound with limitations which hamper access, especially in developing regions. Frequent power outages and, in some cases, limited computer terminals in libraries prevent user access (Adeyemo, 2017).

**High Costs and Funding:** Establishing and maintaining an e-library involves high costs for hardware, software and licensing, which often limits their scalability and sustainability. Apart from university libraries which have about 10% of the capital allocation set aside for the library by law, other libraries do not enjoy such provision. The interest of the Chief Executive in other types of library and his relationship with the Librarian, in most cases influence budgetary allocation to the library. Even when a budgetary allocation is made for the library, it is the first to be cut in the event of financial crisis. Lack of budgetary provision has been a major problem in managing fisheries information in Nigeria. As an example, Volume 9 of the Nigerian Fisheries and Aquatic Science Abstracts was published and distributed in 2000. Volumes 10 and 11 were compiled and ready for publication for three years but unfortunately there was no funding available. In fact the two volumes were produced in 2004 and 2005 with assistance from FAO in support of improved access to fisheries and aquaculture information and documentation in Nigeria (Ojo, 2019).

**Digital Divide and Accessibility:** A significant gap exists between users with and without access to technology, particularly in rural or low-income areas (World Bank, 2019; Udoh, 2020).

**User and Staff Training:** Both users and staff often lack the necessary information technology (IT) and digital literacy skills to effectively use or manage digital platforms, leading to low utilization rates (Chowdhury, 2016).

**Information Management and Retrieval:** E-resources are often scattered across different publisher's platform, making searching and navigation difficult, as opposed to a centralized physical collection (Karki & Gautam, 2018).

**Copyright and Security:** Protecting intellectual property rights in a digital medium is complex. There are also concerns regarding data security, privacy, and unauthorized access (FAO, 2019).

**Content Obsolescence:** Digital materials can become outdated, or due to rapid changes in technology, inaccessible over time, requiring constant investment in preservation strategies (De Silva & Soto, 2018).

**Language Barriers:** limited availability of resources in local languages can create barriers (Afolabi, 2018).

## PROFER SOLUTIONS FOR IMPROVING ACCESS TO FISHERIES INFORMATION IN NIGERIA

**Library Networking at National Level:** There is an established fact that information resource sharing is the norm in developed countries, it is definitely not the case in most developing countries – where in fact there is a greater need. Rosenberg (1993) attributed this to inadequate information infrastructure and lack of a functional national information policy to guide development. The success of a national library and information network depends upon coordination but a major pivotal role has to be played by government. This pivotal role is not forthcoming in our setting. In order to map out strategies for harnessing and sharing information in the areas of fisheries and aquatic sciences, a meeting of the librarians working in fisheries institutions in Nigeria was organized in 2004 (Obidike & Mole, 2015). Hopefully, this could be a way of maximizing the usage of nationally available information. It was during this meeting that we decided to identify journals publishing articles on Nigerian Fisheries and Aquatic Sciences. This is an on-going project and we hope to identify more journals and other grey literatures. The true situation is that each library is not developed enough to meet all of the demands for information needed by Nigerian scientists. Thus, librarians, have to develop mechanisms to maximize the usage of all of the information resources available within the country. The meeting resulted in the conclusions and decisions which it was agreed would be forwarded to the management of the individual institutions. From the resulting communiqué, it is evident that we are still dreaming and the dream will never become a reality without the pivotal role of government in terms of better funding and the development of an information policy (Ibeun, 2004; Adeyemo, 2017).

**Improve Internet Access:** Invest in digital infrastructure to enhance connectivity in fisheries communities (Udoh, 2020).

**Develop User-friendly Interfaces:** Design e-libraries with intuitive interfaces to facilitate easy searching and navigation (De Silva & Soto, 2018; FAO, 2018).

**Quality Control:** Implement peer review and quality assurance processes for online resources (FAO, 2008; WorldFish, 2020).

**Training and Capacity Building:** Provide digital literacy training for fisheries professionals (Adeyemo & Ogundele, 2017).

**Multilingual Support:** Increase availability of resources in local languages (Afolabi, 2018; FAO, 2019; UNESCO, 2019).

## CONCLUSION

In today's world, e-libraries are a crucial tool in fisheries management, providing stakeholders with access to a vast array of information and resources. While there are several challenges and limitations that need to be addressed, the benefits of e-libraries in fisheries management are clear. As the use of e-libraries continues to grow, it is likely that they will play an increasingly important role in supporting sustainable fisheries management.

E-libraries have made learning super exciting for readers, students, scholars, teachers, lecturers, instructors, researchers and publishers. They changed how we see and expect things in schools and institutions. Instead of replacing regular libraries, they gave them a technology upgrade, making learning more fun and easy. Imagine a world where learning is like an adventure that is what e-libraries bring. As we keep going through this new way of learning, e-libraries are like our helpful guides, making sure knowledge has no limits. They are like the heroes making our school days full of awesome discoveries.

The pros of e-library can not be over emphasize on fisheries, aquaculture and aquatic biodiversity resources management and conservation. Fisheries management has enjoyed the benefits of e-library and high-tech data sharing such as fisheries and climate change models for better fisheries and aquaculture production.

## RECOMMENDATIONS

For what I called pocket library in otherwords known as e-library to be effective in a developing or undeveloped country like Nigeria:

- There should be a mass intentional computer practical training programme from primary to tertiary schools
- There should be an uninterrupted power supply from rural to urban communities.
- The government should subsidize the cost of smart phones and network data subscriptions.
- There should be availability of Internet network in space.
- Internet users should be informed on cybercrime, cyberfisher and Internet hackers to avoid cyber theft.
- Increased Investment in Digital Infrastructure: There is a need for increased investment in digital infrastructure, including computers, Internet connectivity, and digital literacy training.
- Improved Access to Information: E-libraries should be designed to provide easy access to relevant information, including research articles, policy documents, and technical reports.
- Collaboration and Knowledge-Sharing: E-libraries should be used to facilitate collaboration and knowledge-sharing among stakeholders, including researchers, policymakers, and industry professionals.

By investing in e-libraries and addressing the challenges associated with their use, we can support sustainable fisheries management and ensure the long-term health of our fisheries resources.

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