

The Role of Modern Instruments in Fishing Vessels: Benefits and Drawbacks

Md Ibran Ansari, Haritha M. A., Sadeeda Praveen K. and Faruk Ansari

Faculty of Fisheries, Kerala University of Fisheries and Ocean Studies, Panangad, Cochin, Kerala, College of Food Technology, IGKV, Raipur, Chhattisgarh

SUMMARY

This shows that technological development is a major factor that has affected the design and construction of fishing vessels. Sailing instruments retain their importance in the contemporary world and play a crucial role in improving the fishing sector in terms of public safety, improved effectiveness, and ecology. This article also explores many modern instruments used on fishing vessels, as well as the advantages and disadvantages of that equipment. Such instruments include, but are not limited to, supraelectronic navigation instrumentation, fish finders, catch processing automation, and environmental monitoring. First, it is crucial to point out that these technologies have the following benefits: These technologies provide several benefits: They help fishermen catch more fish and achieve better results in terms of performance and safety, but at the same time, they have drawbacks, which are: The high costs of these technologies lead to a limitation on the access to and fishermen.

INTRODUCTION

Fishing Background Fishing has been one of the oldest and most important ways in which people have provided for themselves and their communities. The use of advanced tools in fishing boats mostly shows a qualitative shift from traditional approaches to improving efficiency as well as sustainable fishing practices. This article outlines the functionality of these instruments, their advantages, and the disadvantages they pose to the fishing trade. Fishing instruments aboard contemporary fishing boats the list of primary fishing instruments on contemporary fishing boats includes many more modern tools that are useful for different stages of fishing.

Key instruments include:

- Navigation Systems
- Fishfinders and sonar systems fall into this category.
- Automated Catch Processing Systems
- Environmental and oceanographic fields employ gauges and probes.
- Communication Systems
- Navigation Systems

Benefits:

- **Accuracy and Speed:** More recently, integrated GPS and ECDIS helped set pinpoint positions and successful navigation plans, resulting in reduced time and fuel consumption.
- **Safety:** Sophisticated radar and collision prevention systems reduce accident probability, as well as keep crews and ships safe.
- **Real-time data:** These are important because they provide frequent updates in the external environment and help decide on possible tracks to change.

Drawbacks:

Cost: High fixed cost with reference to machinery equipment, personnel and materials may pose problems to small-scale fishing ventures.

Technical Issues: However, the major weakness of the system is the dependence on electronic support system that may lead to serious problems connected with the functioning of this kind of device.

Training: This is the process of training the crew members which takes time and lots of money to effect.

Fishfinders and sonar

Benefits:

Sound waves used in fish finders and sonars to locate the school of fish which helps a lot to the fishermen in catching chances.

Selective fishing is advantageous to the environment since fishermen have the ability to identify between the kind of fish they would wish to catch and those that need to be released.

Cost-effectiveness: As a result, the fishing vessels will be spending a shorter time in searching for fishes since it takes less fuel and other related expenses.

Drawbacks:

Environmental Impact: There is evidence that sonar waves harm marine animals especially the whales and dolphins.

Overfishing Risk: High fish detecting levels results in over fishing because of poor regulation which is not good for fish.

Expenses: The only disadvantage that one can come across with an advanced sonar system is the cost of installation. Hardware equipments used in the sonar system are expensive to purchase and also to maintain.

Automated Catch Processing Systems

Benefits:

Efficiency: This issue is well managed by Automation by providing quality and fresh products to the consumers.

Labour Savings: Reduces the time that several employees would have spent in completing the task; a big cut on overall expenses.

Safety and Hygiene: This aids in reducing contact with humans thereby reducing possible contamination and improves safety and cleanliness when handling the catch.

Drawbacks:

Initial Investment: A lot of investment in automatic machinery is however a disadvantage because it is expensive to incorporate and hence may not be financially manageable for most SMEs in fishing.

Maintenance: This might require frequent service and repair to be conducted by expert technicians as a measure of attaining optimal performance.

Job Displacement: Such advancements cause mass dismissals of employees that were previously engaged in the catch processing.

Environmental and oceanographic sensors

Benefits:

Sustainability: Some examples include sensors used to measure water quality, temperature, or any other conditions that would aid in the ability to practice sustainable fishing practices.

Regulatory Compliance: Contributes to cases which have to do with compliance with the laws and policies in the environment towards moderation of Fishing techniques.

Research and Development: It is beneficial and has been incorporated in pursuit of oceanology knowledge apart from preserving marine wildlife.

Drawbacks:

Complexity: Thus, there is a need for some technical input regarding how best to connect them and how best to manage these sensors.

Costs: In some cases, purchasing environmental sensors, as well as the costs associated with installing and maintaining them, may be expensive.

Data Overload: The processing and analysis of large amounts of data becomes complicated when there are no efficient mechanisms for it.

Communication Systems

Benefits:

Safety: Sophisticated communication technology enables one to be in touch with the shore at all times, thereby boosting safety measures in case of trouble.

- Coordination:** Enhances the formation synchronization process among the fleet vessels to increase performance.
- Weather Updates:** This way, it gives weather updates that are current and helpful in determining safe routes to follow.
- Drawbacks:**
- Dependency:** Technology serves as a primary tool for communication but its disadvantage lies in its potential for significant harm during technical issues.
- Cost:** The practical application of effective communication systems involves the purchase and maintenance of complex equipment, which may be expensive.
- Privacy Concerns:** Despite the benefits that greater connectedness brings, perceptions can have negative consequences, including data privacy and security.

Discussion

Enhanced Efficiency and Productivity

The use of modern instruments in fishing vessels has greatly improved and provided deeper insight into the vessels' working capacity. GPS mapping and fish finders eliminate time and juvenile efforts involved in tracking and fishing the fish, thus minimising the effort involved in fish handling. Automated processing systems provide highly processed outputs with minimal effort.

Improved safety and sustainability

Another factor that advances fishing risk management is safety, which has emerged as standard across many modern fishing ventures. The complex navigation and communication facilities enlighten the conditions, decreases the probabilities of accidents and facilitates in managing different mishappenses. Sensors help in maintaining sustainable business practices as the industry relies on data for compliance with laws and protection of sea lives.

Economic Impact

Here, the use of modern instruments is inevitable since they have a critical economic bearing, as was seen above. To most of the SSBs, the cost associated with owning and deploying these tools, alongside the constant costs that are normally incurred to ensure the sustainability of these tools are prohibitive to most operations. Isaac, W. H. ; Blanchard, D. C. Nonetheless, low operating costs give rise to improved circumstances for doing business, and even though potential enhancement of revenues covers these costs, it is advantageous overall.

Environmental Concerns

However, the incorporation of modern day instruments in fishing vessels has been attributed to possible number of detrimental effects to the environment. They are needed because sonar is toxic to the wildlife and because overfishing is more likely to occur without strict controls. Furthermore, some electronics that are manufactured and turned into products may have flaws and their disposal can harm the environment.

Technological Dependency

However, they fail to observe a problem emanating from the general trend of fishing companies' reliance on software technologies in fishing methodologies and apparatus. On the other hand, it has enhanced efficiency in working, has eliminated cases of on- job accidents, and on the other hand has the added advantage of creating operational dependency that is a technical hitch. Appropriate management of failure contingencies and risk control measures are required to address these risks and treat maintenance strategies as major priorities.

CONCLUSION

Technology in fishing vessels is very developed and has introduced high efficacy, security, and even occasionally, sound fishing practices on the water facilities. Nevertheless, such opportunities have rather obstacles; these are the challenges that demand large investments and the formation of corresponding legislation. But then, equal weight must be given to the advantages of fishing to also address the disadvantages so fishing businesses can continue in future.

Note: Thus, the purpose of this article is based on the intent to provide actual examples of establishment of usage of modern instruments in fishing vessels and contribute to the discussions promoting innovation within the sphere of fishing although considering possible drawbacks of such approach.

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