

# Developing Model of Sharia-Based Fisheries Management (SBFM)

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## Abstract

Sustainable fisheries management emphasizes social, economic and ecological balance. Social, economic and ecological sustainability based on a sharia economic approach is expected to become a management approach and pillar so that it can continue to provide optimal, integrated and sustainable benefits. One effort to introduce a sharia economic approach in fisheries management is by introducing Zakat-Infaq-Sadaqah (ZIS) into the sustainable fisheries management model. Initial model development was carried out by introducing ZIS parameters into the Gordon-Schaefer fisheries bioeconomic model. The size of the ZIS can provide a stimulus for the creation of sustainable fisheries management. Fishing gear coefficient (q), environmental carrying capacity (K), natural biomass growth of fish (r), price (p) and cost per unit of catch (c) are closely related to how Allah SWT gives grace, bounty and fortune to His servants (fisherman). Sustainable fisheries management based on sharia economics is expected to change the paradigm and perspective of the community (fisherman) in carrying out fishing efforts by always hoping for blessings and gifts from Allah SWT as well as carrying out zakat-infaq-shadaqah optimally and sustainably.

**Keywords:** Bioeconomy; Sharia economics; Socio-economic; Ecological balance; Sustainable fisheries management; ZIS

## Introduction

Developing a Sharia-Based Fisheries Management (SBFM) model involves integrating Islamic principles and guidelines into the management and sustainability of fisheries [1]. The integration of sharia economic principles into fisheries management aims to enhance sustainability by incorporating religious and ethical dimensions into the governance of fisheries. Sharia principles, rooted in Islamic law and ethics, have a significant influence on various aspects of life, including fisheries management. Sharia, which means "the path" in Arabic, encompasses a broad range of principles and guidelines in Islam, such as Islamic ethics, halal and haram guidelines, and zakat and charity [2].

Islamic ethics that can guide sustainable fisheries practices and fair management. Islamic ethics, which is focus on principles such as stewardship (Khilafah), justice (Adalah), and avoiding wastefulness (Israf), provides a strong foundation for sustainable practices in fisheries and resource management. By integrating these ethical principles into fisheries management, it is possible to develop practices that are not only environmentally sustainable but also socially equitable. This holistic approach ensures that the needs of the present are met without compromising the ability of future generations to meet their own needs.

In Islamic dietary laws, the classification of fish as halal (permissible) or haram (forbidden) is guided by specific principles [3]. Generally, fish are considered halal if they meet certain criteria, though interpretations can vary slightly among different Islamic scholars and schools of thought [4]. By integrating these ethical principles into fisheries management, it is possible to develop practices that are not only environmentally sustainable but also socially equitable [1]. This holistic approach ensures that the needs of the present are met without compromising the ability of future generations to meet their own needs [5].

Integrating zakat and charity with sustainable fisheries management can be a meaningful approach to addressing both social and environmental need [1]. In Islamic tradition, zakat is a form of almsgiving and one of the Five Pillars of Islam. It requires Muslims to give a specific portion of their wealth to those in need. Typically, this amounts to 2.5% of accumulated wealth and assets annually. Charity in Islam, including Zakat, plays a key role in redistributing wealth and helping the less fortunate. Beyond Zakat, there is also Sadaqah, which is voluntary charity given at any time and in any amount. Both mechanisms are integral to fostering social equity and supporting the welfare of the community. In practical terms, this can involve giving a portion of profits from business ventures, personal income, or other forms of wealth. By adhering to these principles, Muslims contribute to societal well-being and adhere to the ethical and spiritual values of their faith. By aligning zakat with sustainable fisheries management, it's possible to create a positive impact on both the environment and the communities that depend on fishing, ensuring that the benefits are shared in a way that respects Islamic principles and promotes long-term sustainability .

Integrating a sharia economic approach into sustainable fisheries management is a unique and promising idea. The Gordon-Schaefer fisheries bioeconomic model, which traditionally balances fish stock dynamics with economic factors, can be adapted to include Zakat, Infaq, and Sadaqah (ZIS) parameters to align with sharia principles. By integrating ZIS into the Gordon-Schaefer model, fisheries management can align with both sustainable practices and sharia economic principles, potentially offering a more comprehensive approach to managing fisheries [1].

## Literature Review

### Challenges in fisheries management

Fishery management faces a complex array of challenges, such as overfishing, by catch, habitat destruction, climate change, and globalization of seafood markets [6]. Overfishing occurs when fish are caught faster than they can reproduce, leading to depleted fish stocks and disrupting marine ecosystems [7]. This problem is exacerbated by advances in fishing technology and increased demand for seafood [8]. Bycatch is the capture of non-target species, including endangered or juvenile fish, often results in significant ecological harm and loss of biodiversity [9]. Bycatch can affect species populations and disrupt the food chain. Habitat destruction is fishing practices, such as bottom trawling, can severely damage marine habitats like coral reefs and seagrass beds [10]. These habitats are crucial for the survival of many fish species and the overall health of marine ecosystems. Climate change made changes in ocean temperature, acidification, and sea level rise are affecting fish distribution, migration patterns, and reproductive cycles. Fish species may move to new areas, potentially leading to shifts in local fisheries and ecosystem imbalances [11]. Globalization of seafood markets is the international trade in seafood can complicate management efforts [12]. Unsustainable fishing practices in one region can have far-reaching impacts on global fish stocks and markets, making it challenging to enforce regulations and ensure sustainable practices worldwide [13].

### Need a better effective fishery management

A better effective fishery management is needed which requires a holistic approach that includes sustainable fishing practices, by catch reduction technologies, habitat protection and restoration, climate change adaptation, and international cooperation [14]. Addressing these challenges requires a coordinated effort among scientists, policymakers, fishers, and conservationists to balance the needs of people with the health of marine ecosystems [15]. Sustainable fishing practices is implementing quotas and regulations to ensure that fishing activities do not exceed the reproductive capacity of fish populations [10]. Bycatch reduction technologies is developing and adopting gear and methods that minimize the capture of non-target species. Habitat protection and restoration is establishing marine protected areas and promoting practices that reduce habitat destruction [16]. Climate change adaptation is monitoring and researching the impacts of climate change on

marine ecosystems and adapting management strategies accordingly [17]. International cooperation is collaborating across borders to ensure that fisheries are managed sustainably and that trade practices do not undermine conservation efforts [18].

### Integrating Islamic value into fisheries management

The idea of integrating Islamic values into fisheries management is both innovative and profound. It suggests a holistic approach to sustainable fisheries that aligns with both environmental science and spiritual principles [1]. The principles of integration Islamic values are the principles of akhlakul karimah and the principles of Zakat, Infaq, and Sadaqah (ZIS).

Akhlakul Karimah, or noble character, emphasizes ethical behavior and responsibility. Applying these principles to fisheries management involves ethical fishing practices and fair distribution. Ethical fishing practices is encouraging fishermen to adopt practices that avoid overfishing and minimize harm to aquatic ecosystems, reflecting the noble character of stewardship and respect for creation. Fair distribution is ensuring that the benefits of fishing are distributed fairly among communities, reflecting the principle of justice and compassion in resource management.

Zakat is a form of almsgiving and one of the Five Pillars of Islam. In the context of fisheries, zakat could be used to fund conservation projects or support communities affected by environmental degradation. For instance, a percentage of the revenue from fishing could be allocated to restore habitats or support research on sustainable practices. Infaq refers to voluntary charity. Fishermen or fisheries businesses could engage in infaq by investing in sustainable technologies or community development projects that benefit the wider society. For example, infaq could fund education and training programs for better fishing techniques or support local markets. Sadaqah is voluntary charity given out of compassion and generosity. Sadaqah can be used to support individuals or communities who are struggling due to environmental challenges or economic hardships related to fishing. It can also be directed towards initiatives that enhance the overall sustainability of the fisheries [1].

### Introduction parameters of Zakat, Infaq, and Sadaqah (ZIS) into bioeconomic model

Integrating zakat, infaq, and sadaqah (ZIS) into a bioeconomic model involves environmental balance, economic equilibrium and sustainability [1]. Environmental balance is recognizing that the aquatic environment is a trust (amanah) from Allah SWT and must be managed in a way that maintains its carrying capacity and ensures the long-term health of fish stocks. Economic equilibrium is balancing the supply and demand for fish with a focus on ethical consumption and equitable access. The bioeconomic model can include mechanisms to account for the social and ethical dimensions of fishing, reflecting the principles of fair distribution and community welfare [19]. Sustainability is applying principles of Islamic stewardship to ensure that fishing practices do not exceed the ecological limits of the environment.

This approach can foster a sense of responsibility and encourage practices that support both the environment and the community.

### Integration with the Gordon-Schaefer model

The Gordon-Schaefer bioeconomic model is a classical approach to managing fisheries by balancing economic returns with fish stock sustainability [1]. Integrating ZIS parameters into this model would involve fishing gear coefficient ( $q$ ), environmental carrying capacity ( $K$ ), natural biomass growth of fish ( $r$ ), and price ( $p$ ) and cost per unit of catch ( $c$ ). Fishing gear coefficient reflects the efficiency of fishing gear. The ZIS approach could support improvements in gear technology or practices that reduce overfishing and promote sustainable practices. Environmental carrying capacity is the maximum population size of the fishery ecosystem that the environment can sustain. ZIS funds could be used to support conservation efforts that protect and enhance the carrying capacity of the ecosystem. Natural biomass growth of fish is the growth rate of fish populations. ZIS resources could be directed towards research and practices that promote optimal growth rates and recovery of fish stocks. Price and cost per unit of catch are the economic factors influencing fishing practices. ZIS could be used to stabilize market prices or subsidize costs in a way that encourages sustainable fishing practices while supporting fishermen.

### Paradigm shift in fishing practices

The sharia-based approach encourages a shift in perspective among fishermen, fostering ethical fishing practices, community welfare, and optimized resource use [1]. Ethical fishing practices emphasize on the blessings and fortune provided by Allah SWT encourages fishermen to adopt practices that align with sustainability and ethical stewardship of resources. Community welfare can be reached by channelling ZIS funds into community projects, there can be a positive impact on local communities, including improved infrastructure, health, and education, which indirectly supports sustainable fisheries [19]. Optimized resource use is the hope for blessings and adherence to sharia principles can lead to more thoughtful and restrained use of resources, helping to prevent overfishing and environmental degradation.

### Sustainable benefits and long-term impact

Implementing fisheries management based-sharia economics model is expected to provide economic stability, social equity, and ecological balance [1]. By aligning financial incentives with sustainable practices through ZIS, fishermen can achieve long-term economic stability while preserving fish stocks. ZIS can be used to address social disparities, improving the quality of life for fishing communities and fostering a more equitable distribution of resources. By focusing on conservation and sustainable practices supported by ZIS, the ecological health of fisheries can be maintained or improved, ensuring that resources are available for future generations. Incorporating sharia economic principles into fisheries management through ZIS could lead to a more holistic and sustainable approach. This

model not only addresses the ecological aspects of fisheries but also considers the social and economic well-being of communities, promoting a balanced and ethical approach to resource management.

### Divine assurance and human responsibility

The belief in divine assurance aligns with the understanding that ultimate success and sustainability come from Allah SWT [1]. However, this belief also necessitates that human efforts are guided by ethical principles and sound practices. By aligning fisheries management with Islamic values, the approach emphasizes trust in divine wisdom and commitment to ethical stewardship. Trust in divine wisdom is recognizing that while humans have a role in managing resources, the ultimate outcome is under the purview of Allah SWT. Commitment to ethical stewardship is ensuring that all actions in fisheries management reflect values of justice, equity, and respect for creation. In conclusion, incorporating Islamic values into fisheries management not only promotes sustainability but also aligns with spiritual principles that advocate for ethical behavior and responsibility. This approach can create a more balanced, just, and sustainable system that benefits both the environment and the communities reliant on fishing.

### Internalizing sharia-based fisheries management

Internalizing sharia-based fisheries management involves a multi-faceted approach to ensure effective implementation and sustainability [1]. It requires several activities and considerations to ensure the successful model implementation. Those activities and consideration consist of stakeholder's engagement, legal and regulatory frameworks, sustainable practices, monitoring and enforcement, evaluation and adaptation, and documentation and dissemination. Each of these activities requires careful planning and execution to ensure that Sharia-based fisheries management is not only legally sound but also socially and environmentally effective.

## Discussion

### Need stakeholder engagement

Stakeholder engagement implemented by conducting community involvement and education and awareness. Community involvement engages local fishermen, community leaders, and Islamic scholars in developing and validating the model. Education and awareness is educating stakeholders about the benefits of Sharia-based management and how it aligns with both Islamic values and sustainable practices.

A breakdown of this activity is as the follows:

- Identify key stakeholders, including local fishermen, community leaders, religious scholars, government officials, and environmental groups.
- Facilitate dialogue, organizing meetings and workshops to discuss Sharia principles related to fisheries and gather input on local needs and conditions.

- Build consensus, working towards a shared understanding and agreement on how Sharia principles will be applied in fisheries management.

### Need legal and regulatory framework

The legal and regulatory framework can be conducted using the approach of compliance with local laws and integration with sharia law. Compliance with local laws ensures that the SBFM model is compatible with existing national and local fisheries regulations. Integration with sharia law is developing guidelines and policies that align with sharia law, and where necessary, work with legal experts to draft regulations that reflect these principles.

A breakdown of this activity is as the follows:

- Align with existing laws, ensuring that Sharia-based management practices are integrated with national and local legal frameworks.
- Develop specific regulations, creating regulations that reflect Sharia principles, such as ethical treatment of marine resources and fair trade practices.
- Ensure compliance, establishing mechanisms to ensure that these regulations are followed.

### Endorse sustainable practices

Sustainable practices can be reached by conducting conservation, resource management and avoiding waste. Conservation implements measures to prevent overfishing, protect breeding grounds, and maintain biodiversity. This aligns with the Islamic principle of not causing harm (Darar). Resource management is using traditional knowledge and modern techniques to manage fish stocks sustainably. This includes setting quotas and protected areas based on scientific research and Islamic teachings. Avoiding waste emphasizes practices that minimize waste in fishing and processing, in accordance with the principle of avoiding Israf.

A breakdown of this activity is as the follows:

- Resource management, implementing practices that prevent overfishing, protect breeding grounds, and promote the sustainable use of fishery resources.
- Environmental protection, incorporating sharia's emphasis on stewardship and conservation of natural resources.
- Promote ethical practices, encouraging practices that align with both Sharia principles and modern sustainability standards.

### Need monitoring and enforcement

Monitoring and enforcement can be implemented by conducting surveillance and penalties and incentive. Surveillance establishes systems to monitor fishing activities and ensure compliance with the SBFM model. This could involve local communities and authorities. Penalties and incentives develop a system of rewards for compliance and penalties for violations, considering both legal and moral aspects.

A breakdown of this activity is as the follows:

- Develop monitoring systems, setting up systems to track fishing activities, resource health, and compliance with regulations.
- Enforce regulations, implementing enforcement strategies to address violations and ensure adherence to sharia-based guidelines.
- Community involvement, engaging local communities in monitoring efforts to enhance transparency and accountability.

### Economic considerations

The economic considerations, particularly fair trade and profit sharing should be implemented to reach the goal of sharia-based fisheries management. Fair trade ensures that the model supports fair trade practices and provides equitable economic benefits to local communities. Profit sharing explores ways to share profits from fisheries with the community, including through Zakat or other charitable contributions.

### Need evaluation and adaptation

Evaluation and adaptation, such as feedback mechanism and regular review is needed to ensure that the model could provide a better sustainable practise in fisheries management. Feedback mechanism creates channels for ongoing feedback from stakeholders and adapt the model as needed. Regular review periodically reviews and update the model to reflect changes in the environment, community needs, and advancements in fisheries science.

A breakdown of this activity is as the follows:

- Assess effectiveness, regularly evaluating the impact of Sharia-based management practices on fisheries and communities.
- Adapt strategies, being prepared to adjust practices based on feedback and changing conditions to improve outcomes.
- Incorporate lessons learned, using evaluation results to refine and enhance the management model.

### Need documentation and dissemination

Documentation and dissemination should be conducted to make sure that the model can be measured and justified as well as expected. They need manuals and guidelines, training program and case studies. Manuals and guidelines prepare detailed manuals and guidelines that outline the SBFM model's principles, practices, and procedures. Training programs develop training programs for stakeholders to ensure effective implementation and adherence to the model. Case studies should be implemented to provide document successful implementations and share experiences with other communities or regions interested in adopting similar models.

A breakdown of this activity is as the follows:

- Share knowledge, disseminating findings and best practices through reports, workshops, and publications.
- Foster collaboration, encouraging sharing of experiences and knowledge with other regions or countries implementing similar models.

- Record practices and outcomes, documenting the processes, regulations, and results of Sharia-based fisheries management.

## Conclusion

Model of Sharia-Based Fisheries Management (SBFM) is grounded in the principles of sharia, emphasizing the ethical and moral obligations of stewardship over natural resources. This includes the issuance of Zakat, Infaq, and Sadaqah (ZIS), which are acts of charity and social responsibility in Islam. The model merges the Gordon-Schaefer fisheries bioeconomic model, which traditionally focuses on optimizing economic returns from fisheries, with Sharia-based ethical considerations. This aims to balance economic efficiency with ecological sustainability and social welfare. Sharia-based fisheries management is based on the modifying of traditional Gordon-Schaefer model to incorporate ZIS factors. This includes adjusting parameters to reflect the impact of zakat, infaq, and sadaqah on both the economic and ecological aspects of fisheries and incorporates strategies for enhancing ecosystem health and resilience. This might involve setting aside marine protected areas, implementing sustainable fishing practices, and monitoring fish stock levels. Using zakat, infaq and shadaqah to create financial incentives for sustainable practices, such as subsidies for eco-friendly gear or rewards for adherence to sustainable fishing quotas. The implementation framework model needs to engage stakeholders, monitoring and evaluation, and education and training. Expected outcomes of the model of sharia-based fisheries management is increasing sustainability, enhancing livelihoods, ecosystem benefits, and social and spiritual fulfillment. By embedding sharia principles into the Gordon-Schaefer model, the BSFM approach aims to create a holistic fisheries management system that benefits both the environment and the community, in line with Islamic values.

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