

# Assessment of Socioeconomic Impacts of Cage Aquaculture on Small-Scale Farmers and its Policy Framework in Lake Victoria, Kenya



Author: Alice A. Hamisi, Kenya Fisheries Service. Email: hamisialice09@gmail.com  
Supervisors: Jon Geir Petursson, PhD, University of Iceland. Email: jgp@hi.is  
Amanda Vang, PhD, Department of Biotechnology, FIRUM. Email: amanda@firum.fo

## INTRODUCTION

- Kenya is witnessing significant growth in aquaculture as an alternative of fish production.
- Initially land-based, the sector has faced several challenges such as poor water quality and reduced land availability.
- In response, new farming systems in natural water bodies were introduced – leading to the adoption of cage aquaculture in Lake Victoria.
- The rapid expansion of cage aquaculture has positioned the sector as a source for increased fish production.
- Widely adopted by small-scale farmers.
- Hence the need to understand the contribution of small-scale farmers and policy dynamics that influence the sector's growth.

## OBJECTIVES

To evaluate the socioeconomic impacts of cage aquaculture development on small-scale farmers in Kisumu and Siaya counties, identify operational challenges, and assess the policy frameworks shaping the sector.

## METHODOLOGY

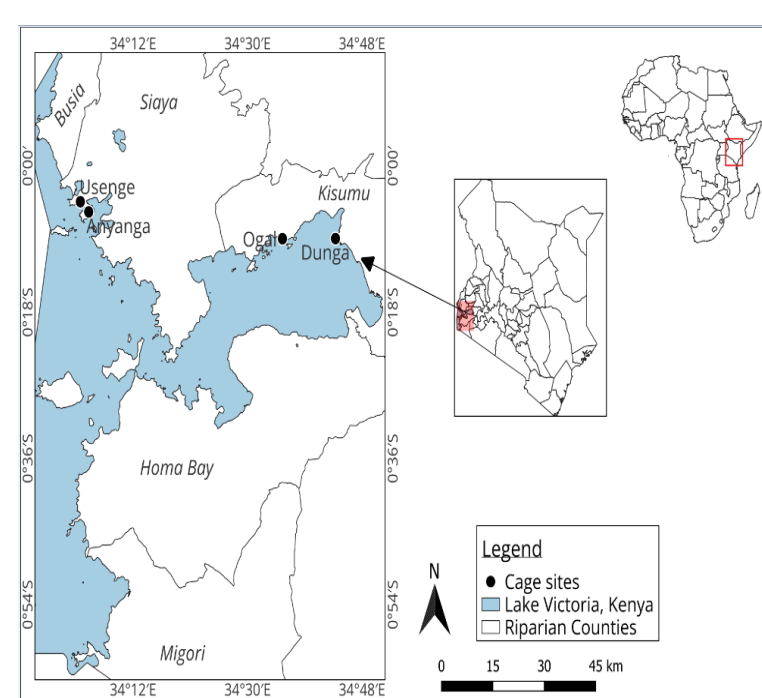


Figure 1. Five riparian counties sharing Lake Victoria.

- A desktop review on relevant policies and regulation documents that directly impact cage aquaculture were analysed.
- Descriptive analysis was done using MS Excel and data presented in charts, graphs and tables.

## RESULTS

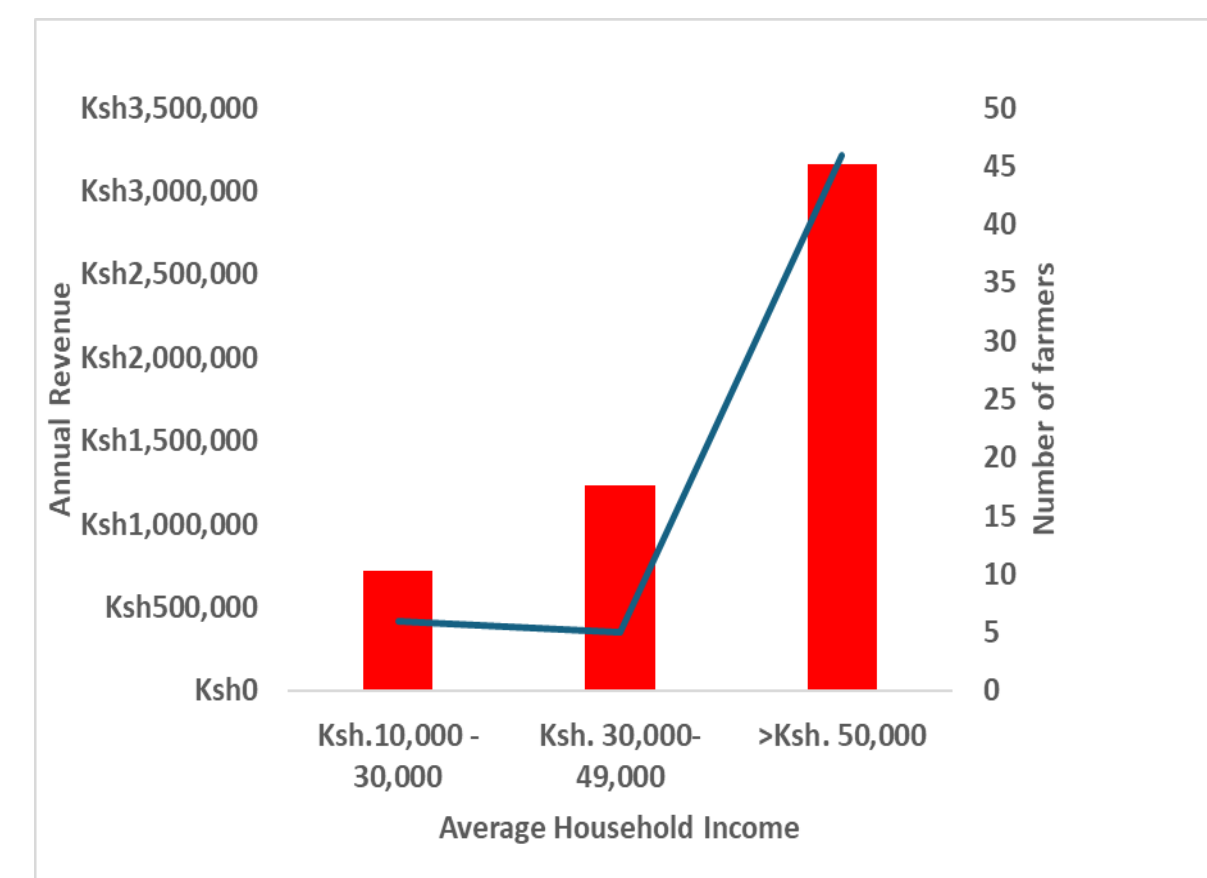


Figure 2. Economic contribution of cage aquaculture on the livelihood of farmers (n=57) (1USD = 120 KES).

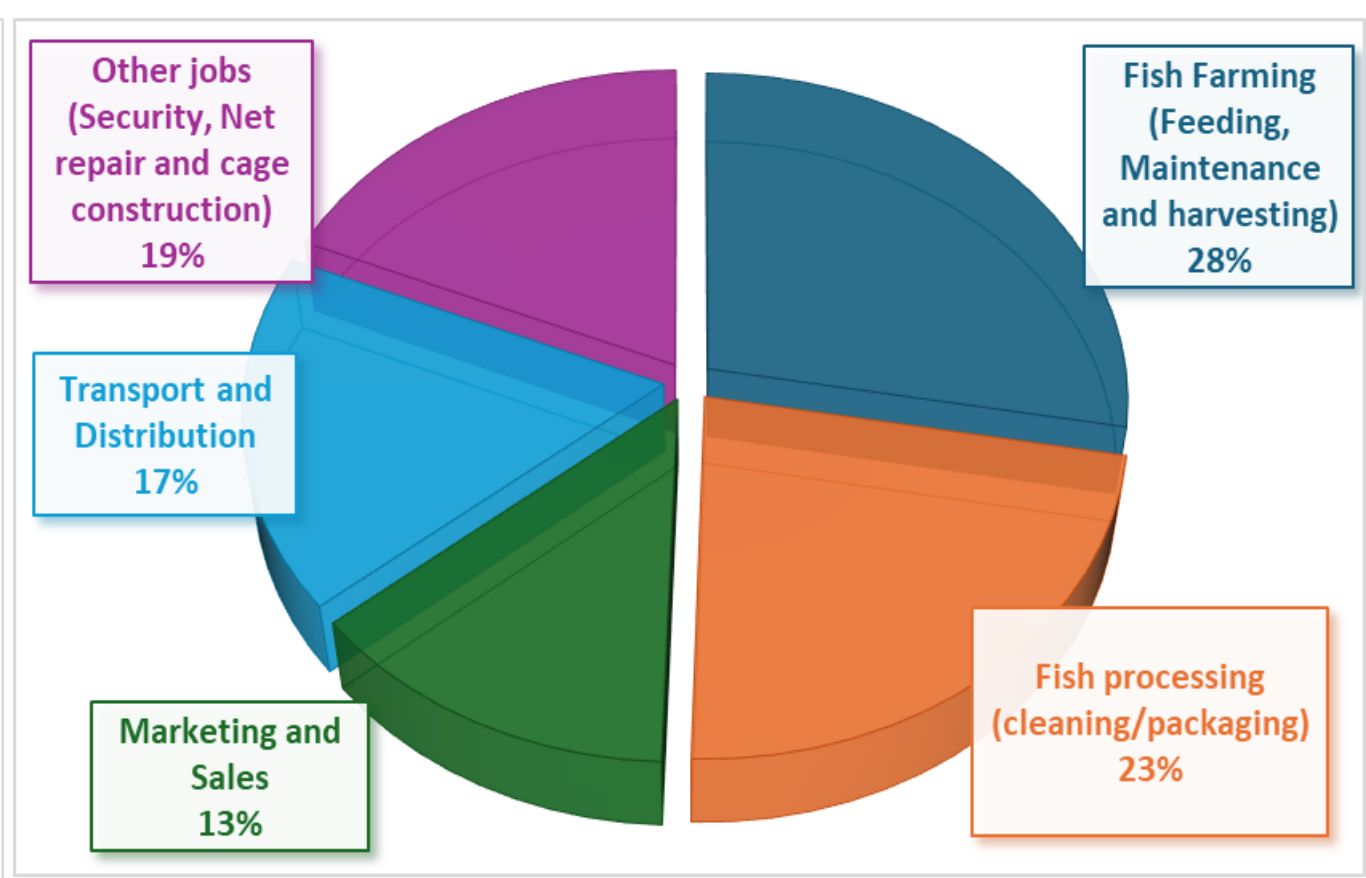


Figure 3. Employment contribution of cage culture and types of jobs created.

Table 1. Key challenges reported and ranked by farmers.

| Challenges                         | Weighted Mean | %Agreement Index | Rank |
|------------------------------------|---------------|------------------|------|
| High cost of cage materials        | 4.2           | 84.3             | 1    |
| Cost of feed                       | 4.2           | 83.9             | 2    |
| Access to cold chain storage       | 3.8           | 75.4             | 3    |
| Quality of feeds                   | 3.5           | 70.5             | 4    |
| Fish mortalities                   | 3.4           | 68.6             | 5    |
| Insecurities/theft                 | 3.4           | 67.4             | 6    |
| Disease management                 | 3.3           | 66.4             | 7    |
| Upwelling                          | 3.1           | 62.9             | 8    |
| Water quality                      | 2.9           | 58.2             | 9    |
| Point source pollution             | 2.9           | 57.5             | 10   |
| Conflict with other resource users | 2.5           | 50.7             | 11   |
|                                    | 3.4           | 67.8             |      |

Table 2. Farmers' awareness and familiarity with sections of policy.

| Section of the policy and regulations documents | Percentage of farmers |
|---|-----------------------|
| Permits and licenses on cage aquaculture        | 28%                   |
| Conservation and management of resources        | 23%                   |
| Data submission                                 | 23%                   |
| Water quality monitoring                        | 18%                   |
| Biosecurity                                     | 14%                   |
| Management of fish escapees                     | 12%                   |

Table 3. Analysis of sections of relevant policy and regulations that directly relate to cage aquaculture.

| Guiding Documents   | Evaluation of sustainability themes by use of traffic light system: Fully addressed (green), partially addressed (orange), not addressed/completely absent (red) not applicable in the regulation/policy (blank/no colour) |                                 |               |                    |                          |                   |                              |                            |           |                       |
|---|--|---------------------------------|---------------|--------------------|--------------------------|-------------------|------------------------------|----------------------------|-----------|-----------------------|
|   | Cage placement   | Environmental and social impact | Water quality | Disease management | Biosecurity and escapees | Licenses/ Permits | Record keeping and reporting | Requirements for expansion | Insurance | community involvement |
| Fisheries Management and Development Act, Cap 378   | ●  | ●                               | ●             | ●                  | ●                        | ●                 | ●                            | ●                          | ●         | ●                     |
| Fisheries management and development (Aquaculture) regulations, 2024                                | ●  | ●                               | ●             | ●                  | ●                        | ●                 | ●                            | ●                          | ●         | ●                     |
| Guidelines for Establishment and Operation of Cage Fish Farming in the East African Community, 2018 | ●  | ●                               | ●             | ●                  | ●                        | ●                 | ●                            | ●                          | ●         | ●                     |

## DISCUSSION

- The survey indicated that cage aquaculture has significantly enhanced revenue generation and household income among most small-scale farmers interviewed, demonstrating its significant contribution to family livelihoods, improved food security and nutrition.
- The sector has created diverse employment opportunities, thereby reducing the unemployment rate and promoting community involvement in cage farming.
- Despite the positive impacts, farmers highlighted challenges such as high input costs and limited access to loans and credit for investment. This underscores the need for government incentives and tailored aquaculture financing products to improve financial access for farmers.
- A good proportion of small-scale farmers are aware of existing aquaculture policies; however, adherence remains moderate. This indicates a need for sensitization and the inclusion of cage aquaculture-specific sections in policy and regulatory documents. The development of the sector depends on good governance and proper management.

## RECOMMENDATIONS

- Support small-scale farmers' growth through incentives, improved credit access, and strengthening farmer cooperatives.
- Align policies with small-scale farmer needs and integrate cage aquaculture-specific provisions in national policy frameworks.
- Expand research on long-term socioeconomic and environmental impacts to inform sustainable strategies.

## ACKNOWLEDGEMENTS

