

# **INTEGRATING LOCAL KNOWLEDGE, SOCIO-CULTURAL INSIGHTS, AND SPATIAL PLANNING FOR SUSTAINABLE MARICULTURE DEVELOPMENT ON MOHÉLI, COMOROS**

**IBRAHIM TAMOU**



**MASTER PROGRAM  
COASTAL AND MARINE RESOURCES MANAGEMENT  
FACULTY OF FISHERIES AND MARINE SCIENCES  
IPB UNIVERSITY  
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Ibrahim Tamou  
C2502231805



## SUMMARY

IBRAHIM TAMOU. Integrating Local Knowledge, Socio-Cultural Insights, and Spatial Planning for Sustainable Mariculture Development in Mohéli, Comoros. Supervised by ALI MASHAR and RAHMAT KURNIA

The study investigates the potential for sustainable mariculture development on Mohéli Island, Comoros, where traditional fishing remains the primary livelihood. With declining fish stocks and growing ecological degradation, mariculture is increasingly viewed as a viable alternative to enhance food security and diversify income sources. However, its success relies on ensuring alignment with local ecological conditions and socio-cultural values, making participatory and informed planning essential.

In response to mounting pressures on marine resources, this study adopts a structured approach built around four interconnected pillars. First, it aims to understand community knowledge, attitudes, and practices related to mariculture. Second, it seeks to evaluate the ecological and economic feasibility of different mariculture types by integrating scientific data with local insights. Third, it works to identify the most suitable development sites through participatory mapping and spatial analysis. Finally, the study strives to recommend inclusive policy strategies that promote sustainable mariculture. Together, these actions form a comprehensive roadmap for responsible marine resource development in small island contexts like Mohéli.

A mixed-methods approach was used to gather primary and secondary data. A KAP (Knowledge, Attitudes, Practices) survey was conducted with 105 respondents, mostly fishers, alongside three focus group discussions (FGDs) involving local stakeholders. Participatory mapping sessions were held in eight villages to identify sensitive areas and suitable zones for mariculture. Additional information was gathered through semi-structured interviews, literature review, and GPS-based field observations.

Quantitative survey data were analyzed using descriptive statistics and Partial Least Squares Structural Equation Modeling (PLS-SEM) to test relationships among knowledge, attitude, and practice variables. Spatial data from participatory mapping were digitized and analyzed using GIS to produce suitability layers. Multi-Criteria Decision Analysis (MCDA) and Analytic Hierarchy Process (AHP) were applied to prioritize ecological, social, and economic criteria for site selection and policy formulation.

Most community members (78%) had heard of mariculture, and over 90% showed positive attitudes towards its potential. However, knowledge remained limited, especially in the North. Women showed slightly higher positive attitudes and practices. Seaweed farming emerged as the most preferred mariculture type due to its low cost and environmental impact. Spatial analysis identified ~2,133 ha as suitable zones, mainly in underused northern and southeastern coasts, avoiding ecologically sensitive areas.

The study confirms strong community interest in mariculture if developed inclusively and with environmental safeguards. Ecological and social factors were

prioritized over economic ones in policy recommendations. The research underscores the importance of participatory planning, gender inclusivity, and co-management strategies. These findings offer a roadmap for balancing ecological sustainability, cultural acceptance, and economic viability in small island mariculture development.

**Keywords:** Sustainable Mariculture, Community Perception, Participatory Mapping, Site Suitability, Small Island Development

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## RINGKASAN

IBRAHIM TAMOU. Mengintegrasikan Pengetahuan Lokal, Wawasan Sosial Budaya, dan Perencanaan Ruang untuk Pembangunan Marikultur Berkelanjutan di Mohéli, Kepulan Komoro. Dibimbing oleh ALI MASHAR and RAHMAT KURNIA

Studi ini menyelidiki potensi pengembangan marikultur berkelanjutan di Pulau Mohéli, Komoro, di mana perikanan tradisional tetap menjadi mata pencaharian utama. Dengan menurunnya stok ikan dan meningkatnya degradasi ekologi, marikultur semakin dipandang sebagai alternatif yang layak untuk meningkatkan ketahanan pangan dan mendiversifikasi sumber pendapatan. Namun, keberhasilannya sangat bergantung pada kesesuaian dengan kondisi ekologi lokal dan nilai-nilai sosial budaya masyarakat, sehingga perencanaan yang partisipatif dan berbasis informasi menjadi sangat penting.

Menanggapi tekanan yang meningkat terhadap sumber daya laut, studi ini mengadopsi pendekatan terstruktur yang dibangun di atas empat pilar yang saling terhubung. Pertama, studi ini bertujuan untuk memahami pengetahuan, sikap, dan praktik masyarakat terkait marikultur. Kedua, studi ini berupaya mengevaluasi kelayakan ekologis dan ekonomis dari berbagai jenis marikultur dengan mengintegrasikan data ilmiah dan wawasan lokal. Ketiga, studi ini bekerja untuk mengidentifikasi lokasi pengembangan yang paling sesuai melalui pemetaan partisipatif dan analisis spasial. Terakhir, studi ini berusaha untuk merekomendasikan strategi kebijakan yang inklusif guna mendorong pengembangan marikultur yang berkelanjutan. Keempat langkah ini secara keseluruhan membentuk peta jalan yang komprehensif untuk pengelolaan sumber daya laut secara bertanggung jawab di konteks pulau kecil seperti Mohéli.

Pendekatan metode campuran digunakan untuk mengumpulkan data primer dan sekunder. Survei KAP (Pengetahuan, Sikap, dan Praktik) dilakukan terhadap 105 responden, yang sebagian besar adalah nelayan, disertai dengan tiga diskusi kelompok terarah (FGD) yang melibatkan pemangku kepentingan lokal. Sesi pemetaan partisipatif dilakukan di delapan desa untuk mengidentifikasi area sensitif dan zona yang sesuai untuk marikultur. Informasi tambahan dikumpulkan melalui wawancara semi-terstruktur, tinjauan literatur, dan observasi lapangan berbasis GPS.

Data survei kuantitatif dianalisis menggunakan statistik deskriptif dan Partial Least Squares Structural Equation Modeling (PLS-SEM) untuk menguji hubungan antara variabel pengetahuan, sikap, dan praktik. Data spasial dari pemetaan partisipatif didigitalkan dan dianalisis menggunakan GIS untuk menghasilkan lapisan kesesuaian. Analisis Keputusan Multi-Kriteria (MCDA) dan Proses Hirarki Analitik (AHP) diterapkan untuk memprioritaskan kriteria ekologis, sosial, dan ekonomis dalam pemilihan lokasi dan perumusan kebijakan.

Sebagian besar anggota masyarakat (78%) telah mendengar tentang marikultur, dan lebih dari 90% menunjukkan sikap positif terhadap potensinya.



Namun, pengetahuan tetap terbatas, terutama di wilayah utara. Perempuan menunjukkan sikap dan praktik yang sedikit lebih positif. Budidaya rumput laut muncul sebagai jenis marikultur yang paling disukai karena biayanya yang rendah dan dampak lingkungannya yang minim. Analisis spasial mengidentifikasi sekitar 2.133 hektar sebagai zona yang sesuai, terutama di wilayah pantai utara dan tenggara yang kurang dimanfaatkan, sambil menghindari area yang sensitif secara ekologis.

Studi ini menegaskan adanya minat yang kuat dari masyarakat terhadap marikultur jika dikembangkan secara inklusif dan disertai perlindungan lingkungan. Faktor ekologis dan sosial diprioritaskan dibandingkan faktor ekonomi dalam rekomendasi kebijakan. Penelitian ini menekankan pentingnya perencanaan partisipatif, inklusivitas gender, dan strategi pengelolaan bersama. Temuan ini menawarkan peta jalan untuk menyeimbangkan keberlanjutan ekologis, penerimaan budaya, dan kelayakan ekonomi dalam pengembangan marikultur di pulau-pulau kecil.

Kata kunci: Marikultur Berkelanjutan, Persepsi Masyarakat, Pemetaan Partisipatif, Kesesuaian Lokasi, Pengembangan dan Pulau Kecil

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**IBRAHIM TAMOU**

Thesis  
as one of the requirements to obtain  
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**MASTER PROGRAM  
COASTAL AND MARINE RESOURCES MANAGEMENT  
FACULTY OF FISHERIES AND MARINE SCIENCES  
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Thesis Examiner Team:

1. Prof. Dr. Luky Adrianto, M. Sc
2. Dr. Ir. Zairion, M.Sc



Thesis Title: Integrating Local Knowledge, Socio-Cultural Insights, and Spatial Planning for Sustainable Mariculture Development on Mohéli, Comoros

Nama : Ibrahim Tamou

NIM : C2502231805

Approved by

Supervisor 1:  
Dr. Ali Mashar, S.Pi., M. Si



Supervisor 2:  
Dr. Ir. Rahmat Kurnia., M.Si.



Acknowledged by

Head of the Study Program  
Coastal and Marine Resources Management:

Dr. Ir. Zairion, M.Sc  
NIP. 19640703 199103 1003



Dean of the Faculty of Fisheries and Marine Sciences

Prof. Dr. Ir. Fredinan Yulianda, M.Sc  
NIP. 19630731 198803 1002



Exam Date: July, 9 2025

Graduation Date:



## PREFACE

This scientific research was conducted from September to November 2024 under the title: “Integrating Local Knowledge, Socio-Cultural Insights, and Spatial Planning for Sustainable Mariculture Development on Mohéli, Comoros Island.” The study aimed to understand community attitudes, evaluate ecological and economic feasibility, identify suitable sites, and recommend policy strategies for sustainable mariculture management. I hope this work proves valuable to those interested in sustainable development and contributes meaningfully to science and local management practices.

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Bogor, July 2025

*Ibrahim Tamou*



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