



Operational and Managerial Challenges in Port-to-Island Logistics

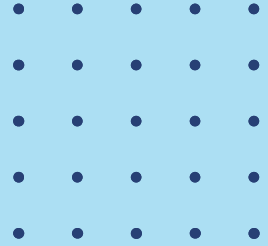


Introduction

- Maritime logistics is important for economic growth and trade in the UAE
- Island areas depend on ports for goods, fuel and transport services
- Dalma Island relies on maritime logistics as the main connection to the mainland
- Logistics demand is increasing due to development and community needs
- Efficient planning and coordination are needed to ensure reliable services



Research Problem



01

Frequent delays in port-to-island operations



02

Weak coordination between stakeholders



03

Infrastructure and capacity limitations



04

Weather disruptions affecting schedules

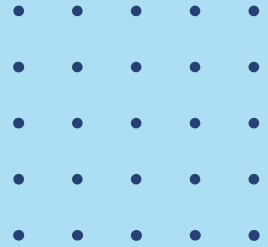


05

Reduced service reliability

These challenges affect logistics efficiency and daily operations in island areas such as Dalma Island.

Research Questions & Objectives



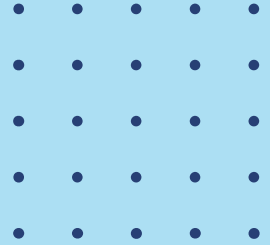
Research Question

What are the key operational and managerial challenges in port-to-island logistics in the UAE, and how can they be improved?

Objectives

- Identify operational challenges
- Examine coordination and communication issues
- Analyze infrastructure impact on performance
- Propose practical improvements

Literature review



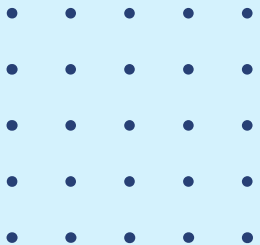
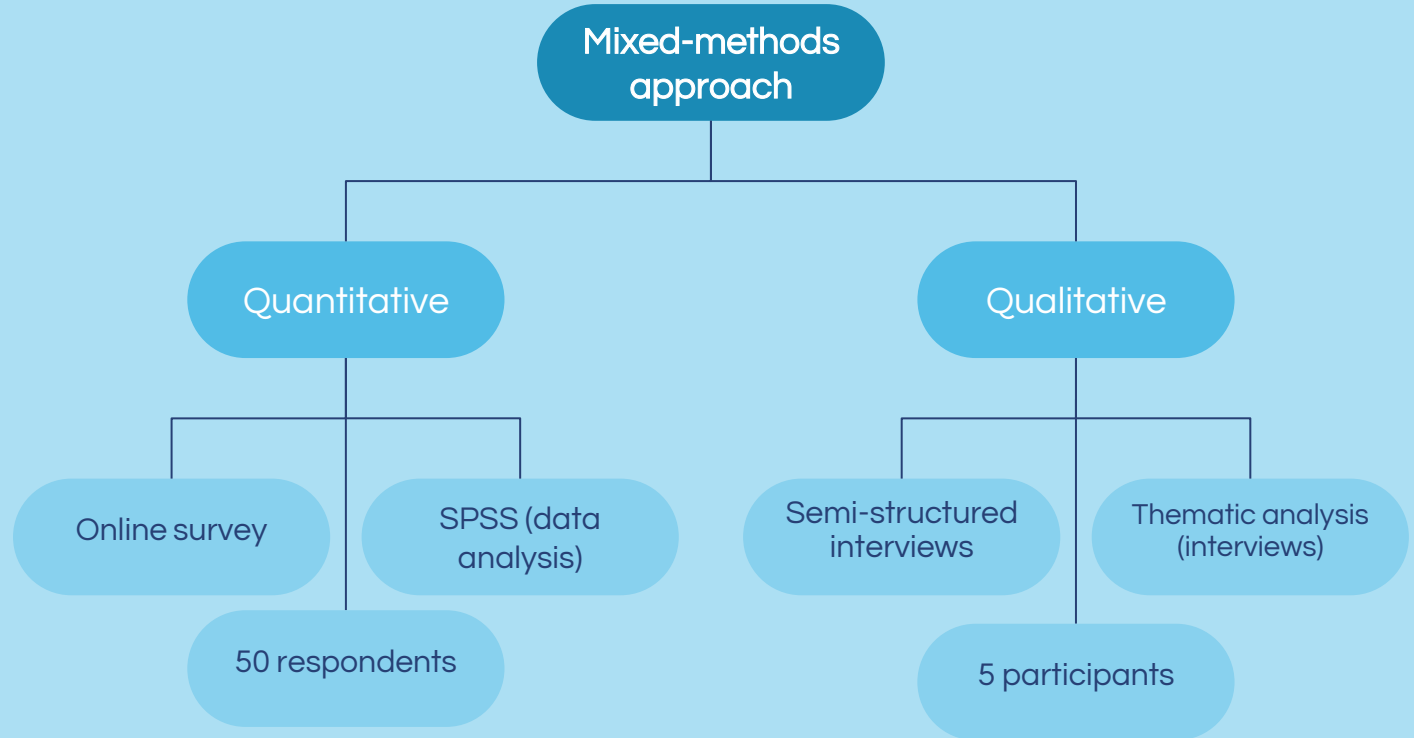
Key Themes from Literature

- Logistics efficiency and service reliability
- Importance of coordination between stakeholders
- Role of infrastructure in performance
- Impact of delays on operations
- Challenges in island logistics systems

Key Authors

- Christopher (2016) – Supply chain coordination
- Rodrigue (2020) – Transport systems integration
- UNCTAD (2014 / 2021) – Island logistics challenges
- Notteboom & Rodrigue (2005) – Port regionalization

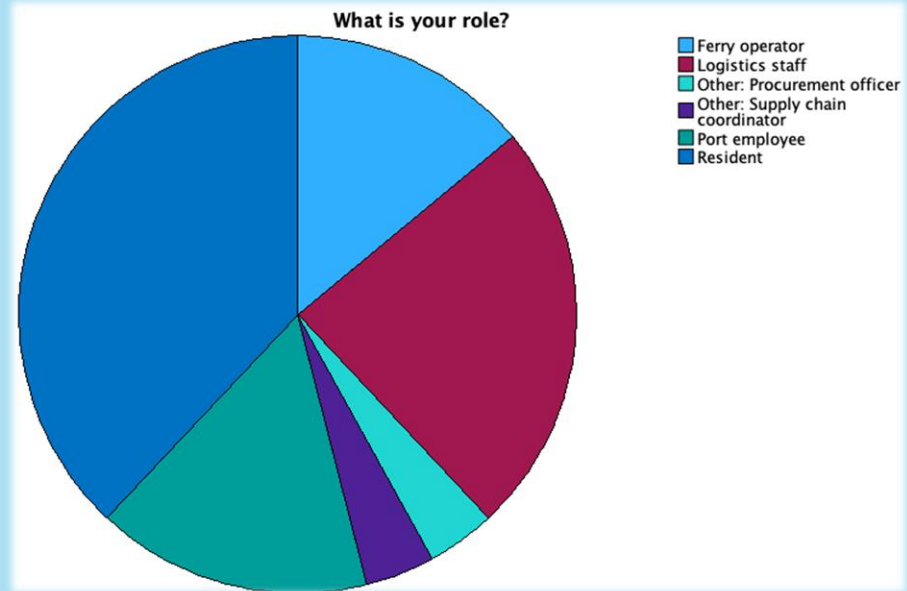
Methodology



Participant Overview

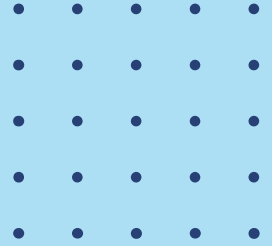
Respondents' Roles:

- Residents (38%)
- Logistics staff (24%)
- Port employees (16%)
- Ferry operators (14%)
- Others (8%)



The sample includes both service users and logistics professionals.

Data Analysis Overview



- Focus on key themes:

01. Delays

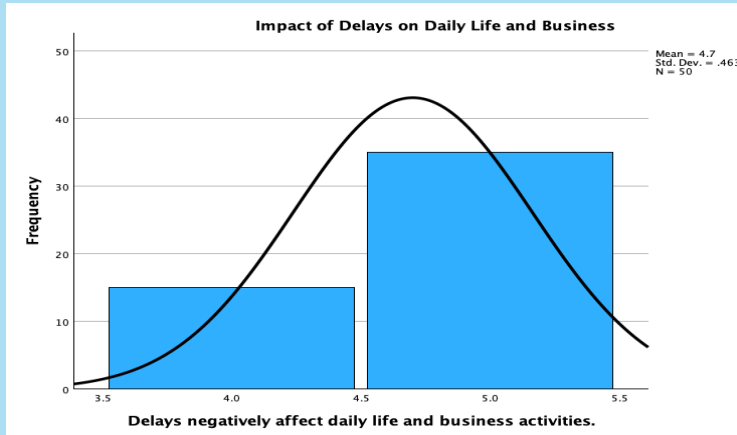
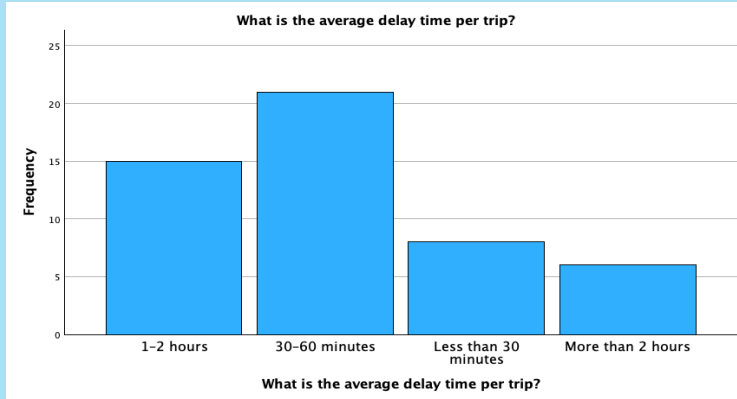
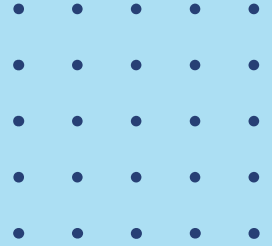
02. Coordination

03. Weather

04. Cost

05. Improvements

Delays in Port-to-Island Logistics

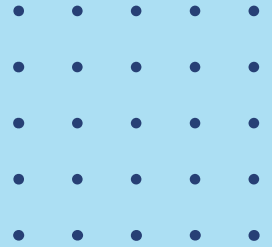


42%

Most respondents reported delays between 30–60 minutes per trip.

- Delays are frequent in daily operations
- Delays affect both businesses and residents
- Service reliability is negatively impacted

Interview Insights – Delays



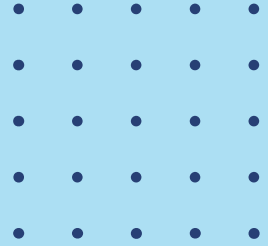
Causes

- Weather conditions
- Scheduling problems
- Limited vessel availability
- Port congestion
- Coordination gaps

Impact

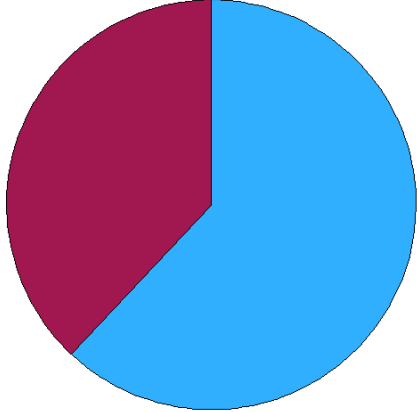
- Delays affect work schedules
- Increased waiting times
- Higher construction costs
- Reduced service reliability
- Disruption to daily routines

Coordination Challenges in Logistics Operations



How many operational or coordination issues do you face per week?

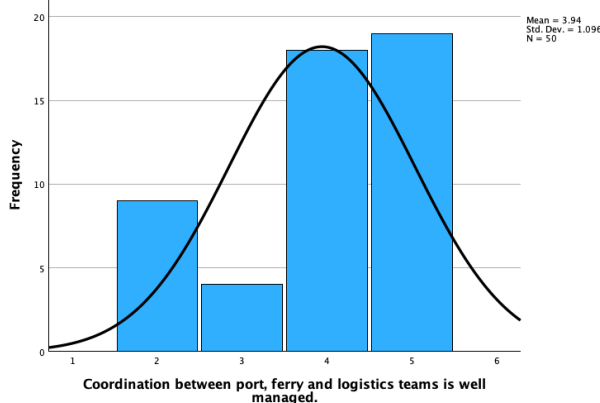
■ 1-2 issues
■ 3-5 issues



62%

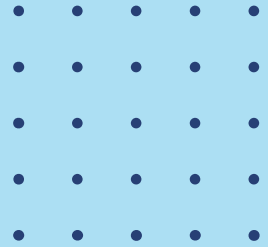
of respondents experience
coordination issues weekly

Coordination Between Port, Ferry, and Logistics Teams



- Communication gaps affect operations
- Coordination is not fully effective
- Weak coordination increases delays

Interview Insights – Coordination



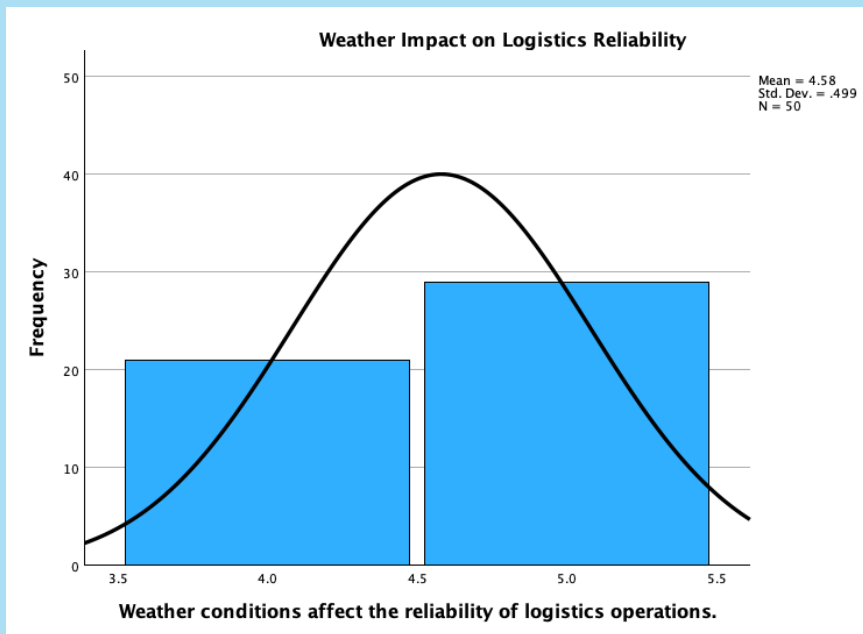
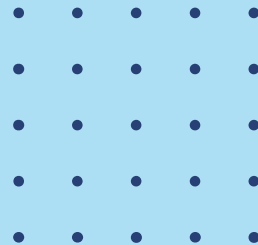
Findings

- Delays in communication between teams
- Late operational updates
- Unclear coordination processes
- Weak real-time communication

Impact on Operations

- Scheduling inefficiencies
- Increased uncertainty
- Reduced service reliability
- Negative customer experience

Weather Impact on Logistics Reliability

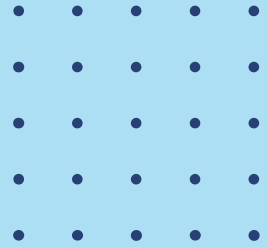


92%

agreement that weather
affects logistics reliability

- Weather strongly affects operations
- High waves and fog disrupt schedules
- Reliability decreases during bad weather

Interview Insights – Weather



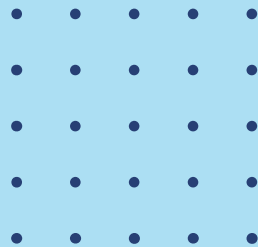
Challenges

- Weather
- Strong winds
- High waves (High tide & Low tide)
- Poor visibility
- Trip cancellations or delays

Operational Impact

- Disrupted schedules
- Delayed cargo delivery
- Reduced reliability
- Operational uncertainty

Cost Challenges



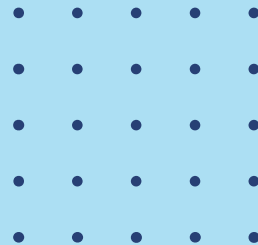
Main Cost Issues

- High cargo transportation costs
- Expensive vessel arrangements
- Additional costs caused by delays
- Higher construction material costs

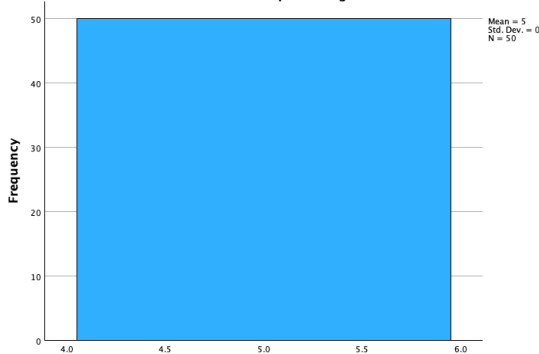
Impact on Users

- Increased project expenses
- Reduced affordability for residents
- Financial pressure on private companies
- Higher operational uncertainty

Improvement Opportunities in Port-to-Island Logistics

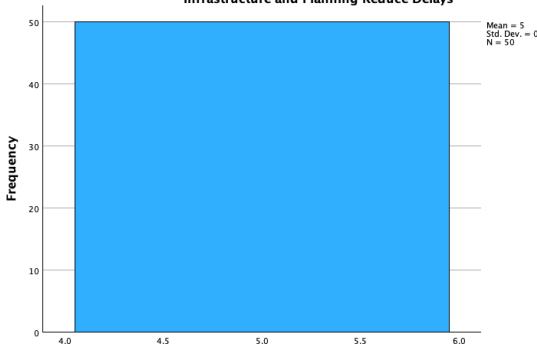


Coordination Improves Logistics Performance



Better coordination can improve logistics performance.

Infrastructure and Planning Reduce Delays



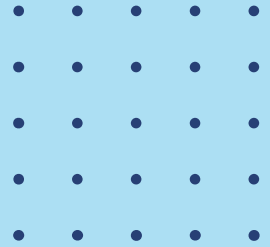
Improved infrastructure and planning can reduce delays and improve service reliability.

100%

Respondents strongly support coordination and infrastructure improvements

- Better coordination improves efficiency
- Infrastructure reduces delays
- Planning improves service reliability

Interview Insights – Improvement Strategies



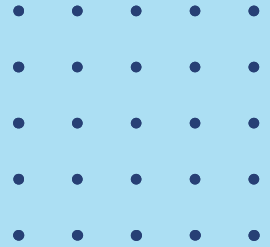
Suggested Improvements

- Better scheduling and planning
- More vessel availability
- Real-time communication systems
- Centralized operational platform
- Improved infrastructure capacity

Expected Outcomes

- Reduced delays
- Faster communication
- Improved service reliability
- Better customer experience
- More efficient logistics operations

Discussion of Findings



01

Findings support previous
maritime logistics
literature



02

Coordination is a key
factor affecting efficiency



03

Infrastructure limitations
affect service reliability



04

Weather conditions
increase operational
uncertainty



05

Digital systems can
improve communication
and planning

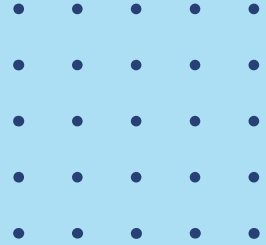
Literature Support:

- Christopher (2016) – Coordination and integration
- Rodrigue (2020) – Logistics system connectivity
- UNCTAD (2021) – Island logistics challenges
- Notteboom & Rodrigue (2005) – Port integration

Conclusions

- Delays are a major challenge in port-to-island logistics
- Weak coordination affects operational efficiency
- Infrastructure limitations reduce service reliability
- Weather conditions increase operational risk
- Logistics costs are higher in island operations
- Better planning and communication can improve performance

Key Recommendations



Improve Coordination & Communication

- Use centralized digital communication systems
- Share real-time operational updates



Enhance Scheduling & Planning

- Use smart scheduling tools
- Improve operational flexibility

Increase Transport Capacity

- Improve vessel availability
- Reduce congestion during peak periods



Invest in Infrastructure

- Expand port facilities and storage areas
- Upgrade loading and unloading equipment

Use Digital Technologies

- Cargo tracking systems
- Real-time monitoring and data analytics



Develop Weather-Responsive Strategies

- Use weather forecasting systems
- Create flexible operational plans

Reduce Logistics Costs



- Shared cargo systems
- Better resource utilization

Limitations & Future Research

01.

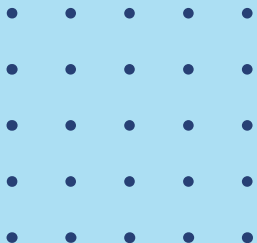
Limitations:

- Limited sample size
- Focus on Abu Dhabi's Islands only
- Based on participant perceptions
- Descriptive analysis only

Future Research:

- Include larger sample sizes
- Compare multiple island locations
- Use advanced statistical analysis
- Explore digital technologies in logistics

02.



Bibliographical references

Abu Dhabi Ports (2020) *Abu Dhabi Ports announces completion of Delma Port's second phase of development*. Available at: <https://stg.adportsgroup.com/en/news-and-media/2020/12/04/abu-dhabi-ports-announces-completion-of-delma-ports-second-phase-of-development> (Accessed: 23 March 2026).

AD Ports Group (2022) *Annual Report 2022*. Abu Dhabi: AD Ports Group. Available at: <https://www.adportsgroup.com> (Accessed: 28 April 2026).

Bichou, K. and Gray, R. (2004) 'A logistics and supply chain management approach to port performance measurement', *Maritime Policy & Management*, 31(1), pp. 47–67.

Christopher, M. (2016) *Logistics & Supply Chain Management*. 5th edn. Harlow: Pearson.

DP World (2023) *Annual Report 2023*. Dubai: DP World. Available at: <https://www.dpworld.com> (Accessed: 28 April 2026).

Koray, M., Kaya, E. and Keskin, M.H. (2025) 'Determining logistical strategies to mitigate supply chain disruptions in maritime shipping', *Sustainability*, 17(12), p. 5261.

Mangan, J., Lalwani, C. and Butcher, T. (2012) *Global Logistics and Supply Chain Management*. 2nd edn. Chichester: Wiley.

Notteboom, T.E. and Rodrigue, J.P. (2005) 'Port regionalization: towards a new phase in port development', *Maritime Policy & Management*, 32(3), pp. 297–313.

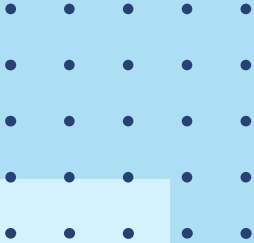
Rodrigue, J.P. (2020) *Transport Terminals and Hinterlands*. Available at: <https://transportgeography.org/contents/chapter6/transport-terminals-hinterlands/> (Accessed: 23 March 2026).

Thompson, D.D.P. (2015) 'Disaster logistics in small island developing states', *Disaster Prevention and Management*, 24(2), pp. 166–184.

Tongzon, J. (2001) 'Efficiency measurement of ports using data envelopment analysis', *Transportation Research Part A*, 35(2), pp. 107–122.

UNCTAD (2014) *Small Island Developing States: Transport and Trade Logistics Challenges*. United Nations.

UNCTAD (2021) *Review of Maritime Transport 2021*. United Nations.



Thanks!

Do you have any questions?

