UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT

Port Management Series

Case studies from the TrainForTrade Port Management Programme

English-speaking network 2019-2024

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Note

In this publication, the terms "country" and "economy" refer, as appropriate, to territories or areas. The designations used and the presentation of the data do not imply any opinion on the part of the United Nations Secretariat concerning the legal status of any country, territory, city, or area, or of its authorities, or concerning the delimitation of its frontiers or boundaries.

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Abbreviations

APEC	Anvers Port Training Center
CSR	Corporate Social Responsibility
EL/S	Eastern Leyte/Samar
EPA	Environmental Protection Agency
ERP	Enterprise Resource Planning
GBP	Pound sterling
GHG	Greenhouse Gas
GPHA	Ghana Ports and Harbours Authority
GIS	Geographic Information System
GRDP	Gross Regional Domestic Product
GSA	Ghana Standards Authority
HPI	Holcim Philippines Incorporated
IAPH	International Association of Ports and Harbors
IDR	Indonesian rupiah
IHMA	International Harbour Masters Association
IMO	International Maritime Organization
IPCC	Indonesia Port Corporation Car Terminal
ISO	International Organization for Standardization
KPA	Kenya Ports Authority
LNI	Lanao del Norte/Iligan
MPL	Maldives Ports Limited
MPS	Meridian Port Service
NGN	Nigerian Naira
NPA	Nigerian Ports Authority
PMO	Port Management Office
PMP	Port Management Programme
PMS	Port Management Series
PPA	Philippine Ports Authority
PPE	Personal Protective Equipment
PPS	Port Performance Scorecard
PSCP	Public Service Continuity Plan
PT PJM	PT Pelindo Jasa Maritim

PT PMS	PT Pelindo Marine Service
PTB	Passenger Terminal Building
RCII	Republic Cement of Iligan Incorporated
RMC	Routine Medical Check-up
SDGs	Sustainable Development Goals
SIP	Social Impact Policy
SOAR	Strengths, Opportunities, Aspirations, Results
TEU	Twenty-foot Equivalent Unit
TMA	Tema Metropolitan Assembly
ToT	Training of Trainers
TPA	Tanzania Ports Authority
TZS	Tanzanian Shilling
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
UNESCO	United Nations Educational, Scientific and Cultural Organization
WPSP	World Ports Sustainability Program

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Chapter I

Introduction

UNCTAD TrainForTrade Port Management Series is periodically published in English, French and Spanish. This 14th volume presents the port members of the TrainForTrade Port Management Programme English-speaking network alongside network partners and donor Irish Aid.

UNCTAD and Port Development

UNCTAD supports the efforts of developing countries to become more fully integrated into the global economy and occupy a place that truly reflects their dynamism, expertise, resources, and potential. Established in 1964 as a permanent inter-governmental body, and as the principal organ of the United Nations General Assembly dealing with trade, investment and development issues, UNCTAD has established a necessary role in assisting developing countries and their economies catch up with the increasingly globalised world. In the area of trade, the focus is on trade facilitation and the reduction of barriers, such as non-tariff obstacles. UNCTAD therefore assists developing countries in implementing wide-ranging institutional and regulatory reforms.

In this context, UNCTAD pays particular attention to ports, which remain the primary gateways of international trade and critical nodes in global logistics networks. With nearly 80% of goods transported by sea, the crucial role of ports remains an integral part of sustainable development.

Ms. Rebeca Grynspan, Secretary-General of UNCTAD, reminds us that "*global production and distribution networks must become more inclusive, sustainable, and resilient — and UNCTAD analysis underscores that 'ports are sea bridges and lifelines' in ensuring value-chain continuity.*" Ports serve as powerful levers, where policies can shape the future of an entire country.

Today, UNCTAD Global Supply Chain Forum, highlights this everlasting need for continued cooperation and collaboration across all actors in global supply chains, with ports playing a vital role among such stakeholders. Decisions made at ports have direct impacts not only on economic growth and activity but also on environmental protection and social issues, such as workplace well-being and gender equality.

Ports play a central role in serving developing countries so that they may integrate effectively into the world economy. To support them, UNCTAD fosters dialogue, produces statistics and research to inform decision-making and organises technical assistance activities—including the TrainForTrade Port Management Programme.

The TrainForTrade Port Management Programme

The Port Management Programme (PMP) brings together port professionals across public and private entities around the world with the aim of training the next generation of leaders, sharing knowledge and expertise, creating synergies, fostering cooperation, and ultimately promoting the equitable participation of developing countries in global trade.

The PMP aims to strengthen talent management and human resources development in ports in developing countries. The main objectives of PMP are to:

1. Strengthen institutional capacity and management efficiency of ports and related agencies.
2. Promote port community participation and public-private partnerships.
3. Enhance the competitiveness of ports and the quality of their services.
4. Improve the environmental sustainability and social responsibility of ports.

At the heart of the programme is a 240-hour course on Modern Port Management delivered in participating ports by both certified local instructors trained through the TrainForTrade Port Management Programme and international instructors and experts from partner ports. Conducted over a period ranging from eighteen to twenty-four months, the course on Modern Port Management consists of eight modules covering all aspects of port management, including the latest port-related developments such as digitalisation, sustainability, energy transition and decarbonisation. At the end of each module participants validate their learning through an online test, managed and hosted in Geneva, Switzerland, by the TrainForTrade team.

The dissertation is the cornerstone of the programme. From the beginning of the course on Modern Port Management, each participant is encouraged to pay close attention to the realities of their port. They must identify a problem and/or an improvable situation and develop a reform plan to address it with the ultimate goal of improving operations and efficiencies in their ports and port communities. This process requires participants to take a business management approach to problem solving and involves conducting a literature review, consulting resource persons, using data and statistics, and conducting field investigations. This exercise fosters dialogue within ports and often breaks down invisible barriers created by routine or institutional divisions.

Final dissertations are fundamentally practical and results-oriented. Participants are expected to produce a report that may be presented to the highest authorities in their port. Each participant is expected to clearly present his or her dissertation before a three-person panel of experts. These international juries are comprised of an UNCTAD expert, the mentor (who has been guiding the participant throughout his or her work process), and an external expert from the participating port/port community.

The case studies that have come out of the PMP have proven their value over the years, with many of the reform proposals implemented across member ports. Moreover, the research carried out within one port is often replicable, as many developing countries face similar challenges.

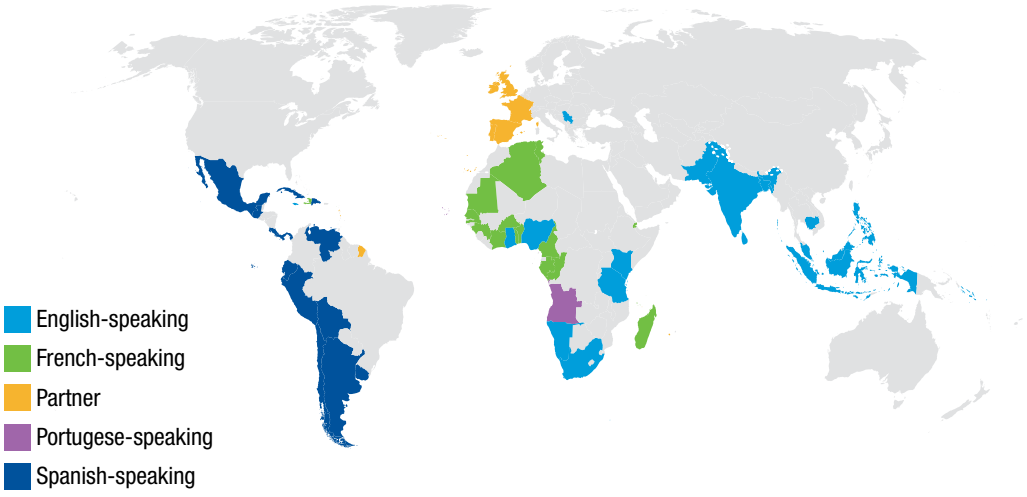
> The case studies require research, analytical, communication, and creative skills. They serve to solve real-world problems and think about the future sustainably.

Three linguistic networks, one family

Today, the Port Management Programme exists across three linguistic networks: English, French and Spanish, spanning from Latin America and the Caribbean across to Africa and onwards to South and Southeast Asia. Since 1998, the Programme has benefited 6,202 port professionals (28% women) from 60 countries.

At the time of this publication, the English-speaking network is comprised of 6 active members: Ghana, Kenya, the Maldives, Nigeria, the Philippines and the United Republic of Tanzania. The English-speaking network has also enjoyed the participation of Bangladesh, Cambodia, India, Indonesia, Jamaica, Malaysia, Namibia, Pakistan, Serbia, Solomon Islands, South Africa and Sri Lanka. The network fosters triangular and South-South cooperation, making use of TrainForTrade trained experts by sending them to other port members to instruct modules of the course on Modern Port Management. Since its inception in 2007, the English-speaking network enjoys the support of Irish Aid and its Irish port partners (Belfast, Cork and Dublin), as well as the Ports of Las Palmas and Valencia from the PMP Spanish-speaking network. Where the Training of Trainers workshops are held bringing together instructors from across the network once a year for a 10-day conference style seminar.

Figure I.1
Members of the TrainForTrade Port Management Programme (1998–2025)



Source: TrainForTrade

Triangular and South-South Cooperation are at the heart of the TrainForTrade Port Management Programme

While the three linguistic networks operate independently, certain events bring them together. Periodically, members of the three networks participate in larger gatherings, further fostering network strength and South-South Cooperation. Port Management Week in Gran Canaria, Spain, hosted by the Las Palmas Port Authority, took place in 2022. In October 2023, representatives from the three networks collaborated in Valencia, Spain, for the Port Management Scorecard Conference focusing on the TrainForTrade Port Performance Indicators. And in May 2024, representatives once again came together in Barbados for the first UNCTAD Global Supply Chain Forum where port resilience was a key topic.

The Port Management Series

The Port Management Series is a collective of concrete solutions rooted in working to achieve the United Nations SDGs

Published in English, French and Spanish independently for each linguistic network TrainForTrade's Port Management Series (PMS) offers readers summaries of the best case studies put forward by participants of the course on Modern Port Management. This PMS volume 14 covers the period of 2019-2024 for the English-speaking network. The participants involved come from ports in Ghana (cycle 5), Indonesia (cycle 5), Nigeria (cycle 3), and the Philippines (cycles 3 and 4).

This introductory chapter provides background information on UNCTAD, the Port Management Programme and the dissertation process. Chapter II presents the English-speaking network of the PMP, where partnerships and port partners are presented, allowing for a deeper understanding of the long-lasting relationships TrainForTrade has fostered over the years.

Chapter III, the focus of this publication, is dedicated to the presentation of the dissertation authors and their mentors, summaries of the works, and the impacts realised thanks to the research and problem-solving of port-related challenges. The dissertation is looked upon as a professionally produced business report where ports and port communities may benefit from local in-house expertise thanks to the skills acquired from the training. Together, the dissertations—available through a searchable database—form a rich collection of case studies that serve as a valuable shared knowledge resource for members of the Port Management Programme.

Chapter IV is dedicated to sustainability and drawing direct linkages between the PMP and the United Nations Sustainable Development Goals (SDGs). This chapter showcases the joint venture between TrainForTrade, the International Association of Ports and Harbors (IAPH) and the Port of Antwerp-Bruges Training Center (APEC), which has given rise to the well-known business game, *Port Endeavor*, an immersive simulation on sustainable port management.

Chapter II

Partnerships

Since the signing of the Dublin Declaration in 2007, the Port Management Programme English-speaking network has enjoyed the support of its long-time partner, Irish Aid. Today the network continues to foster strong partnerships both with port partners (the Port of Cork Company, Dublin Port Company, and Belfast Harbour Commissioners), as well as international entities (IAPH, APEC, International Harbour Masters Association (IHMA) and Women's International Shipping and Trading Association playing an integral role in the sustainable development of modern ports around the world. A special thanks to the Port Authorities of Las Palmas, Valencia and Valencia Foundation who also provide support to the English-speaking Network.

A History of Cooperation

Officially launched in 2007 with the Dublin Declaration, the Port Management Programme English-speaking network is proud of its Irish roots. Since the network's founding, participants and port partners alike have enjoyed exchanging best practices and discussing how ports of all shapes and sizes may continue to grow and become more sustainable in a collaborative manner.

With almost two decades of partnerships, the strength of the English-speaking network has proven lasting. First signed between TrainForTrade and Dublin Port Company, the partnership launched by the Dublin Declaration has today expanded to the Port of Cork Company and Belfast Harbour Commissioners in Northern Ireland (United Kingdom). By committing support and engagement, these three ports do well to collaborate and chair TrainForTrade activities. By bringing together staff representing all functions of a modern port, from pilots to human resources managers to terminal and shipping line operators, both participants of the Port Management Programme as well as staff of the port partners are able to learn and exchange with like-minded counterparts. The joint appreciation for the PMP from its port partners has brought tremendous value to the English-speaking network thanks to the meaningful exchanges fostered. In 2018 participants of the PMP were honoured with a visit to the residence of the Irish president (Áras an Uachtaráin), Mr. Michael D. Higgins, showing just how deeply valued the Port Management Programme is across the island of Ireland. TrainForTrade thanks Irish Aid and its port partners for their continued support of the Port Management Programme.

Minister Sean Canney, TD, Minister of State at the Department of Transport of Ireland gives opening remarks for the closing dinner and award ceremony of the 2025 Training of Trainers hosted by the Dublin Port Company, Dublin, May 2025.

Irish Aid

Mr. Michael Gaffey, Director-General of Irish Aid Joins participants, Port of Dublin staff, and UNCTAD trainers following the opening session of the 2025 Training of Trainers workshop, hosted by Dublin Port Company, Dublin, May 2025.

Irish Aid is the Government of Ireland's development cooperation programme. Managed by the Department of Foreign Affairs and Trade, it reflects Ireland's commitment to reducing global poverty and promoting sustainable development.

The work of Irish Aid is guided by Ireland's national development policy titled "A Better World", which was launched in 2019 and remains relevant to the current uncertain global context. It sets out four key priority actions: reducing humanitarian need, climate action, gender equality and strengthening governance.

Irish Aid works in close cooperation with governments, NGOs, multilateral organizations and local communities in more than 130 countries, with a primary goal: reaching those furthest behind first. This means focusing on the most vulnerable groups, in the most vulnerable countries: least-developed countries (LDCs) and small island developing states (SIDS) represent indeed a primary target for Irish Aid.

Ireland's own history, its experience of development, modernisation, and globalisation constitute the foundation of Irish Aid: we have known poverty and hunger, but we have also seen our country transformed over the past fifty years, through our own efforts and with the assistance of others. This is why Irish Aid remains committed to the United Nations target of allocating 0.7 percent of gross national income (GNI) to Official Development Assistance by 2030. However, on our own, we will not have sufficient impact and we need to work with others to address global issues.

As Director-general of Irish Aid, I am proud to reaffirm our support for the UNCTAD TrainForTrade Port Management Programme. This partnership reflects Irish Aid's commitment to inclusive and sustainable economic development.

Ports are vital gateways to trade, growth and regional integration. For many developing countries, especially the least developed among them and small islands, efficient and well-managed ports are essential for economic advancement. The UNCTAD Port Management Programme addresses this by building local capacity, strengthening management practices and promoting cooperation among port officials regionally and globally. The overview of the dissertations included in this publication are testament to the hard work and high standards achieved within the Port Management Programme.

Irish Aid has supported this programme since its inception in 2007, recognizing its unique role in providing capacity and knowledge building to port managers from around the globe. As a small island ourselves, we understand the importance of ports as essential links to the global economy, given that our own development has been shaped by maritime trade. The engagement of Cork, Dublin and Belfast ports is a key dimension of the programme.

We look forward to continuing this long-lasting collaboration with UNCTAD, our partner countries and Irish ports as we work together to build a better, more connected world.

Mr. Michael Gaffey, Director General of Irish Aid

Aerial view of Belfast Harbour

Belfast Harbour Commissioners

Tonnes of trade
24 100 000

TEUs
1 234 000

Belfast Harbour is Northern Ireland's primary gateway for trade, services, and tourism, handling over two-thirds of the region's imports and exports. Covering 2,000 acres, it supports a diverse range of industries, including financial services, IT, aerospace, film and engineering.

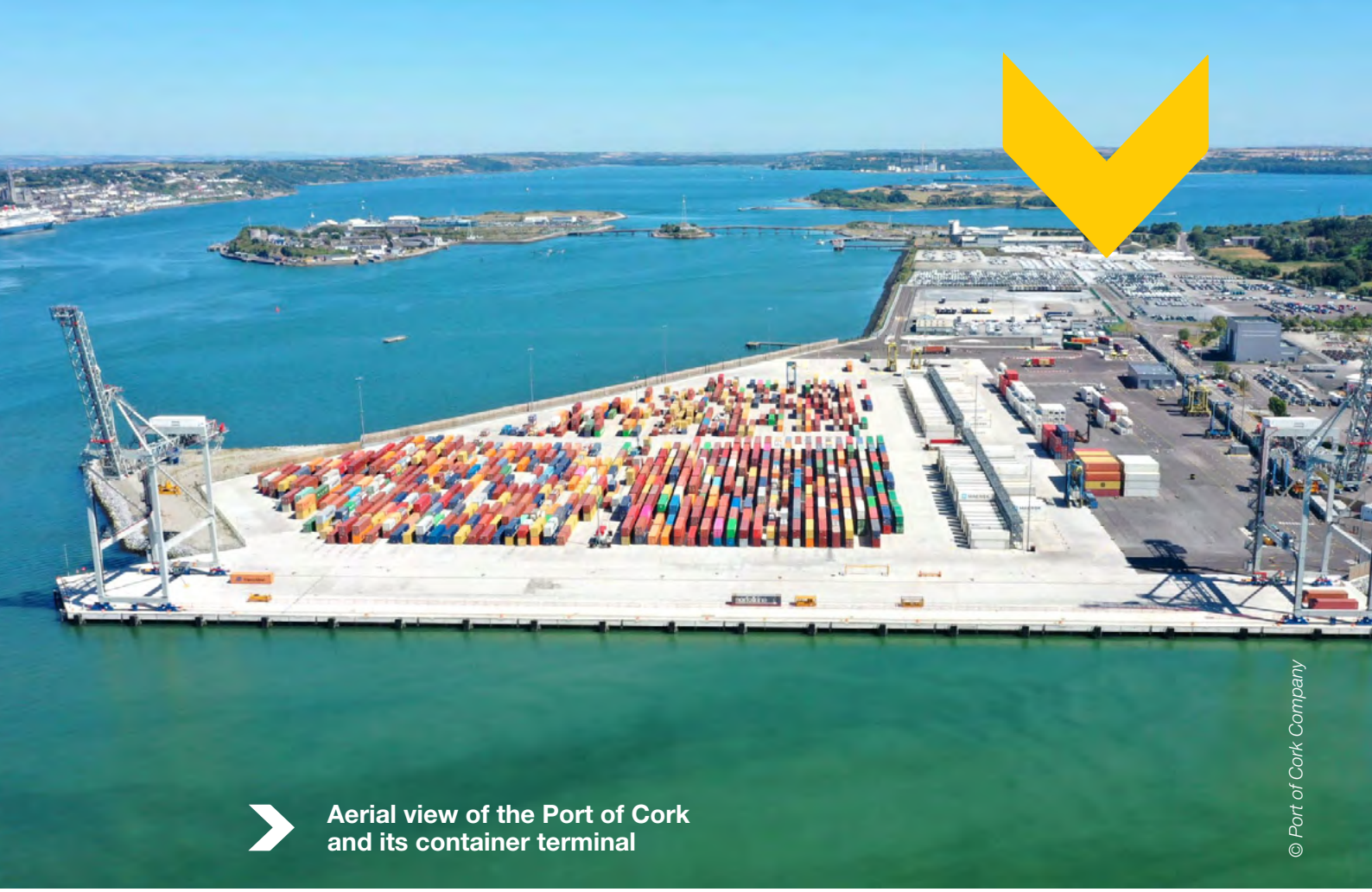
The port is a major economic driver, contributing significantly to Northern Ireland's economy. In 2024, it handled 24.1 million tonnes of trade and facilitated 1.2 million TEUs and 1.7 million ferry passengers. Belfast Harbour also plays a key role in cruise tourism, with 145 cruise calls in 2024, bringing 260,000 passengers to Northern Ireland adding an estimated value of 20-25 million GBP of cruise tourism to the economy each year.

Since its establishment in 1847, Belfast Harbour has continually invested in infrastructure and development. Over the past decade, 374 million GBP was invested to boost port and estate facilities. The port operates as a Trust Port, reinvesting profits into further development to support the region's growth.

An ambitious new strategy, Advance Regional Prosperity 2025-2029, launched in January 2025 outlining plans to invest 300 million GBP in port improvements and estate regeneration over the next five years, ensuring Belfast Harbour remains a vital economic hub for Northern Ireland's future prosperity.

Belfast Harbour is very proud to have supported the English-speaking network of UNCTAD TrainForTrade Port Management Program for more than 15 years. In 2019 we made the decision to become a full partner in the programme and that year we hosted the UNCTAD Training of Trainers event in Belfast where many of our Senior Managers were directly involved in the program to deliver learning modules and content to participants from around the globe. This event and subsequent training we have delivered is clearly of benefit to the learning "students" themselves but equally provides excellent career development opportunities for our own staff. In that sense, we see clear benefits for both entities and we are delighted to continue to be part of the UNCTAD programme.

Mr. Michael Robinson, Port Director



Aerial view of the Port of Cork and its container terminal

Port of Cork Company

The Port of Cork Company (PoCC) is a commercial semi-state company and one of Ireland's most significant seaports, located on the south of Ireland, near to transatlantic shipping lanes. The Port of Cork is one of Ireland's three Ports of National Significance (Tier 1), designated to support and drive economic development by developing port capacity and delivering top class maritime and logistics services to our customers. Cork Harbour, the world's second-largest natural harbour, supports trade, economic growth, strategic partnerships and marine leisure activities. PoCC operates the deeply strategic and deepwater port facilities spanning Cork City, Tivoli, Cobh, and Ringaskiddy across Cork Harbour.

In recent years, PoCC invested 94 million GBP in a new Container Terminal in Ringaskiddy and are midway through the development of Ireland's only dedicated Off-Shore Renewal facility called CORE 1. Port of Cork is a multi-modal port and supports direct global connectivity, especially for industries like Med-Tech, Pharma, IT, Chemicals, Cruise shipping and Agri-Food.

The combined Ports of Cork and Bantry accommodated a total consolidated traffic throughput of 8.9 million tonnes in 2024. The Container TEU trade increased by 6%, dry bulk trade increased by 28%, and 104 cruise liners visited the Port of Cork, up 9% over the same period in the previous year. PoCC employs over 170 staff and supports thousands of indirect jobs in logistics and shipping. Its top 35 customers contribute to 145 billion GBP in manufacturing output, supporting over 45,000 jobs in the southwest region.

The Port of Cork Master Plan 2050 was completed, approved by the board and launched by the Minister for Transport in

2023. The Port will undergo a complete relocation and expansion programme in the coming years taking into account maritime, landside and transport connectivity which identifies constraints and opportunities.

The journey identified in the masterplan, involves relocating port operations downstream, away from the Cork City Docks and Tivoli Docks in the upper harbour, and consolidating them in the lower harbour, particularly in our deepwater facilities at Ringaskiddy.

The key objectives are to:

- Accommodate larger global vessels by moving to deeper waters
- Consolidate operations for greater efficiency and sustainability
- Enhance global connectivity for the southern region of Ireland

Tonnes of trade
8 900 000

TEUs
280 034

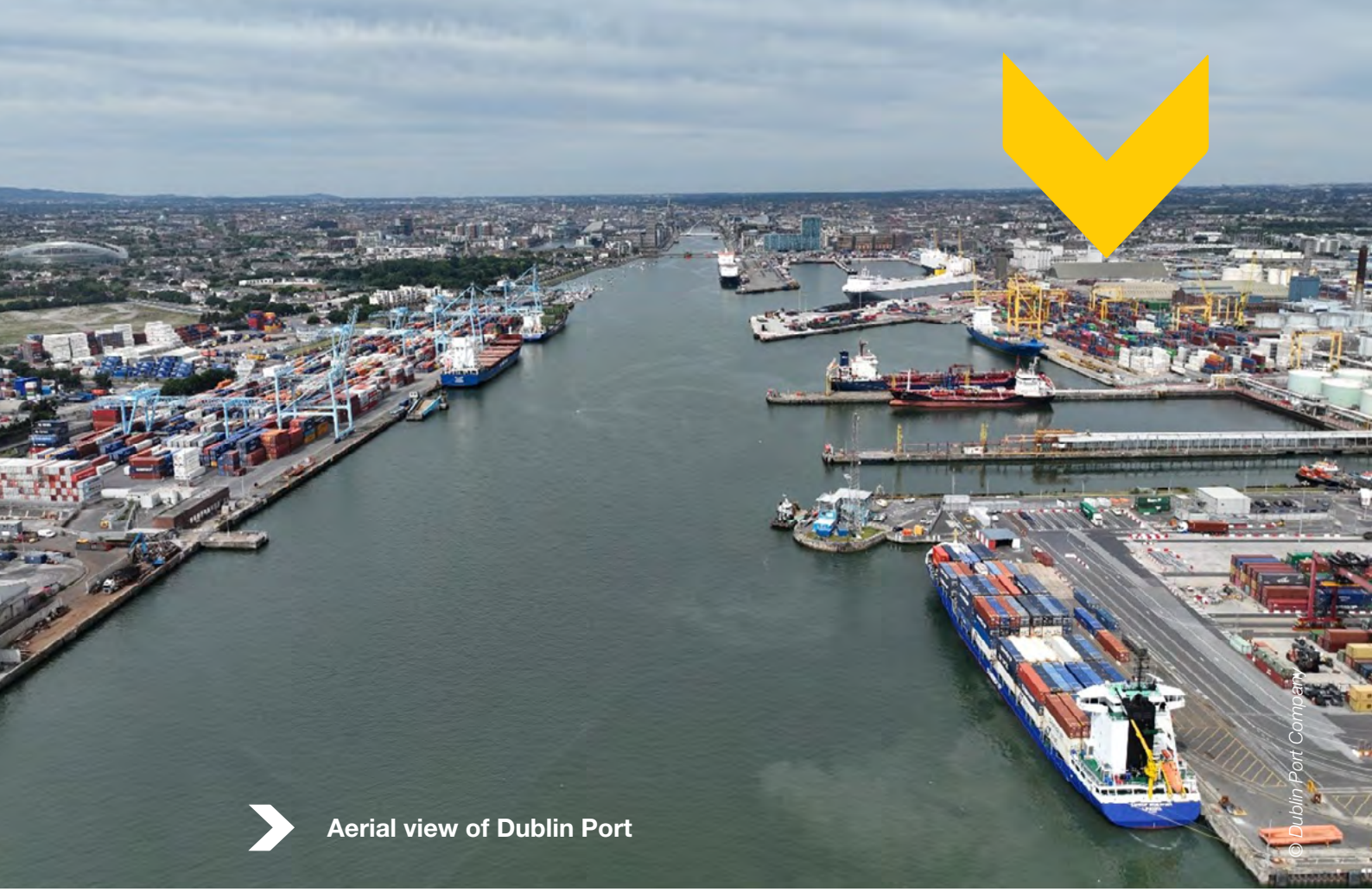
© Port of Cork Company

In 2014, Port of Cork joined UNCTAD Port Management Programme, following Dublin (2007) and preceding Belfast (2018), in a partnership which aims to support and enhance developing ports. The Port is very proud to be a supporting member of the programme and has hosted UNCTAD ToT workshops on several occasions at the Port of Cork. The workshops have been truly enriching for both us as hosts and for the participants.

The Port of Cork Company is much more than a participant—it is a core partner in UNCTAD's efforts to professionalise port management globally, offering financial support, training delivery, and programme development, while serving as a gateway and exemplar for international capacity-building.

Working with the team at UNCTAD and with Irish Aid to support this programme has been extremely fulfilling for the Company and me personally. This is something that we do with pride, working together with our fellow professional colleagues from other ports. It is a voyage of education but also a voyage of collaboration, innovation, networking and sustainable development.

Ms. Ann Doherty, CEO, Port of Cork Company



Aerial view of Dublin Port

Dublin Port Company

Dublin Port is operated and developed by Dublin Port Company, a State-owned commercial company, with all freight handling activities carried out by private sector operators in intensely competitive markets within the Port.

Dublin Port is one of five major ports classified as Tier 1 / Tier 2 ports in National Port Policy and is categorised as a core Port in the TEN-T network[1]. Dublin Port's large share of national freight volumes, particularly in the Ro-Ro and Lo-Lo modes, arises due to a combination of two factors, location and depth of water. Located in the heart of Dublin City and at the hub of the national road and rail network, Dublin Port is a key strategic access point for Ireland, and particularly the Dublin area.

Dublin Port is intrinsically linked to the economic success of Ireland and handles 80% of all unitised freight in the Republic of Ireland, with most cargo emanating from within 90km of the port itself. As such, Dublin Port is part of a world class route-to-market system facilitating 165 billion euros worth of trade annually. With over 15,000 ship movements a year, we play a critical role in the supply chain system, keeping Dublin and Ireland moving forward.

Dublin Port has evolved over more than 300 years, enabling the growth of Dublin City itself. As Ireland's premier port, it is an essential cog in our national economy, however it is also much more than that. With over 300 years of history, it is a cornerstone of Dublin's heritage and with relationships built over many years, it's an integral part of surrounding local communities.

[1] Trans-European Transport Network (TEN-T). More information at https://transport.ec.europa.eu/transport-themes/infrastructure-and-investment/trans-european-transport-network-ten-t_en.

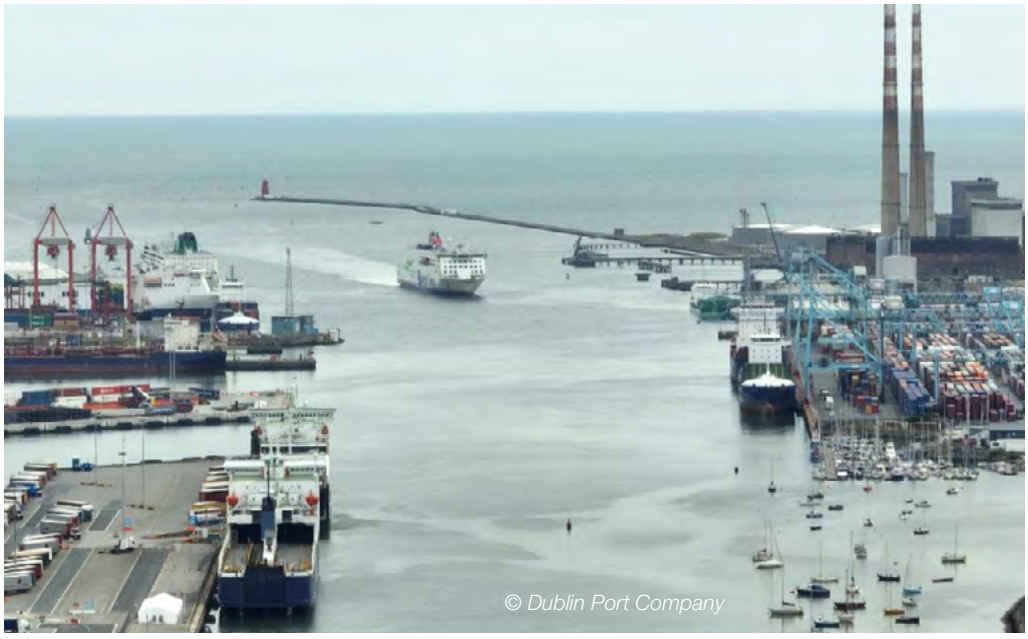
Looking into the future, Dublin Port will continue to be a key enabler of international trade and a great neighbour.

Key Facts and Figures 2024:

- Trade Volume: 35.2 million tonnes
- Trade Value: 165 billion euros
- Ship Movements: 15,000
- Lo-Lo TEUs: 885,435
- Ro-Ro Units: 944,300
- Passengers: 1.6 million
- Trade Vehicles: 107,000

Tonnes of trade
35 200 000

TEUs
1 433 527



Entrance to Dublin Port

© Dublin Port Company

Dublin Port is proud to have participated in the UNCTAD TrainForTrade programme since its inception under the Dublin Castle Declaration in 2007. Over the last 20 years, many of our employees have travelled around the world as trainers for the Programme and have hugely benefited from the interactions and friendships with successful senior port managers from Africa, Asia, and Europe. Dublin Port has also been delighted to host the Modern Port Management training programme several times, and we have welcomed hundreds of participants to Ireland's capital city, supported by Irish Aid.

Dublin Port is Ireland's largest and busiest port, and we enjoy good relationships with the other ports on the island of Ireland, including the other Irish partner ports of the TrainForTrade Programme, Belfast, Cork and Shannon Foynes. We are a multimodal port handling all freight types in a highly efficient manner within a small footprint in an urban setting and within a United Nations Educational, Scientific and Cultural Organization (UNESCO) biosphere. So, we have much to share with other ports nationally and internationally, and similarly much to learn.

Our business is by its nature international, and as the world around us changes and sustainability becomes more urgent, the exchange of knowledge and best practices has never been so important. Staff from Dublin Port have travelled around the globe to places such as Namibia and the Philippines to help train executives and share knowledge as part of the TrainForTrade programme. We are very proud of their ongoing contribution.

As we undertake major infrastructure investments at Dublin Port through our Masterplan2040 programme, we look forward to sharing our insights into balancing major construction works with environmental and community considerations. These projects will also introduce new innovative technologies to Dublin Port, future-proofing our infrastructure for the long term.

On behalf of Dublin Port, I commend the organisers and participants.

Barry O'Connell, CEO, Dublin Port Company

International Harbour Masters Association

Mr. Mark Assaf, Chief of TrainForTrade presenting at the 1st African Harbour Masters Committee Seminar in Tangier, Morocco, 2023

IHMA is a globally recognised professional organisation dedicated to serving the interests of harbour masters and port professionals worldwide. Established in 1996, IHMA represents a vital link between harbour masters, port authorities, and the wider maritime industry. With a growing membership across over 50 countries, the Association provides a unique platform for networking, professional development, knowledge exchange, and the promotion of safe, secure, and efficient port operations globally.

IHMA's central mission is to support harbour masters in their critical role within the maritime chain, enhancing their ability to manage ports effectively, safely, and sustainably. The Association advocates for best practices and works to elevate the professional standards of harbour masters, who are responsible for the safe navigation, berthing, and departure of vessels, as well as for the overall management of marine operations in ports.

One of IHMA's most significant distinctions is its consultative status at the International Maritime Organization (IMO). This status enables IHMA to participate in key IMO meetings and working groups, contributing expert insights and ensuring that the practical perspectives of harbour masters are included in the development of international maritime legislation and policy. Through its active involvement with the IMO, IHMA plays a crucial role in shaping global maritime safety, security, and environmental standards.

Members of IHMA benefit from access to a global network of peers, a private forum to share knowledge and seek advice, opportunities for professional growth, and a platform to voice concerns at international forums. The Association works closely with governments, industry stakeholders, and other maritime organisations such as the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA), International Maritime

Pilots' Association (IMPA), European Sea Ports Organisation (ESPO) and the World Association for Waterborne Transport Infrastructure (PIANC), to advocate for the profession and support safe and sustainable port development worldwide.

The Association organizes the biennial IHMA Congress, a flagship event that brings together harbour masters, maritime professionals, and industry leaders from around the world. This event fosters dialogue on current challenges, innovations, and developments in port and harbour operations. Complementing this global forum, IHMA has recently launched its inaugural biennial seminar series, previously known as the European Harbour Masters' Committee Seminar. These seminars offer the same international platform with a more regional focus, addressing current challenges faced by harbour masters.

In an era of rapidly evolving maritime challenges, from digital transformation and decarbonisation to security threats and climate resilience, IHMA remains at the forefront of advocating for harbour masters. By championing their role and providing a voice on the international stage, the International Harbour Masters' Association continues to uphold its commitment to excellence in port and harbour management for the benefit of the global maritime community.

Support of the International Harbour Masters Association for the TrainForTrade Programme

IHMA is proud to support the UNCTAD TrainForTrade Port Management Programme, a vital initiative that strengthens port capacity and performance across the globe. Given the focus of UNCTAD on regions where many IHMA members are based, this collaboration presents a meaningful opportunity to share expertise and extend the reach of both organisations.

IHMA recognises the strategic value of contributing to key areas of the Port Management Programme, especially in modules 1 to 4, which form the foundation of the curriculum. IHMA's members, many of whom bring years of operational experience from ports around the world, are well-positioned to provide insight into practical port management challenges and solutions. As the programme evolves, IHMA also aims to contribute actively to the forthcoming TrainForTrade port management components which align with its commitment to safety, security, and sustainable port operations. Furthermore, IHMA looks forward to supporting the review and update of modules 1 to 4, ensuring the content remains relevant, accurate, and reflective of current global standards.

In addition, IHMA intends to promote wider access to critical resources, such as the Energy Transition in Ports initiative of UNCTAD, by making these materials available to its global membership. This will help foster a better understanding of sustainable practices and drive energy transition efforts at ports of all sizes.

While IHMA currently offers a contributory bursary to support members pursuing the Harbour Master diploma course, it has encountered challenges in extending this support to harbour masters from developing countries, who often lack financial backing from their home ports. In light of this, IHMA is exploring a similar bursary model to facilitate participation in the UNCTAD Port Management Programme, making this high-value training more accessible to those who need it most.

To further promote learning and engagement, IHMA will consider presenting selected sections of modules 1 to 4 at its future Congresses and Seminars. These events provide a valuable platform for sharing knowledge with an international audience of harbour masters and maritime professionals. Additionally, the interactive Port Endeavor game—a simulation designed to highlight decision-making in sustainable port development—may also be played during IHMA events to enhance understanding of the Programme's themes in an engaging format.

IHMA is committed to contributing meaningfully to TrainForTrade's goals and to supporting a more connected, resilient, and forward-looking global port sector.

Mr. Captain Paul O'Regan, President of International Harbour Masters Association and Harbour Master of the Port of Cork

Official Memorandum of Understanding signing ceremony between the International Harbour Masters Association and TrainForTrade

May 22, 2025, Belfast, Northern Ireland, United Kingdom. (Pictured from left: Mr. Gary Wilson, Conference Lead; Mr. Paul O'Regan, President of the International Harbour Masters Association; Mr. Mark Assaf, Chief of TrainForTrade; Mr. Kevin Allen, Harbour Master, Belfast Harbour; Mr. Loic Sinquin, Harbour Master, Port of Bordeaux; Mr. Michael McKenna, Harbour Master, Dublin Port).

TrainForTrade and IHMA made their partnership official with the signing of a Memorandum of Understanding (MoU) in May 2025. This MoU will pave the way for mutually beneficial support of both parties, with IHMA providing instructors to members of the TrainForTrade English-speaking network and assisting with course material updates, and TrainForTrade reserving space for IHMA members to participate in activities of the Port Management Programme such as Training of Trainers and dissertation juries. Both will continue to support each other at stakeholder events, such as IHMA's annual congress.

Chapter III

Network Impact

The English-speaking network represents a key pillar of the TrainForTrade Port Management Programme. Its members each possess unique know-how and skills, rooted in specific geographical, economic, and socio-cultural contexts. In this diverse collective, everyone has something to contribute and experiences to share. With 461.45 million tonnes of cargo and over 36 million TEUs, the ports of the English-speaking network represent a significant share of global maritime trade. This chapter presents network beneficiary members alongside case studies, their authors and mentors between 2019-2024, showcasing how these professionally developed works contribute to the shared knowledge of modern port management globally.

Port of Tema

Ghana Ports and Harbours Authority

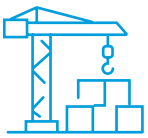
Strategically positioned along the Gulf of Guinea, the Ghana Ports and Harbours Authority (GPHA) serves as the cornerstone of Ghana's maritime trade and logistics. Managing the country's two principal ports — Port of Tema in the east and Port of Takoradi in the west — GPHA plays a central role in regional economic integration and trade facilitation, serving not only Ghana but also several landlocked countries in West Africa.

Port of Tema, the largest port, is Ghana's primary multipurpose port and major gateway for containerised cargo. It has undergone extensive modernization in recent years, including the commissioning of a dedicated container terminal. The port currently handles over 1.6 million TEUs as well as over 24 million tons of cargo. Port of Takoradi, traditionally focused on bulk exports, such as manganese and bauxite, has expanded to include specialised terminals to support containerized cargo and the offshore oil and gas industry currently handling over 10 million tons of cargo per year.

GPHA is committed to transforming into a smart, sustainable, and globally competitive port operator. This vision is anchored in the deployment of digital technologies, sustainable infrastructure, and capacity-building initiatives. The Authority's investment in automation, paperless port processes, and green initiatives reflects its dedication to environmental stewardship and operational excellence.

Beyond its infrastructure and logistics role, GPHA is a leader in human capital development, ensuring that its personnel and stakeholders are equipped to navigate the evolving demands of the global maritime sector. The Authority's collaboration with international partners, particularly within the UNCTAD TrainForTrade Programme, is a testament to its commitment to excellence, knowledge sharing, and global best practices.

Tonnes of trade
24 000 000



TEUs
1 600 000

In GPHA, we strongly believe that the strength of a port lies not only in its infrastructure, but in the people who make it function. The TrainForTrade Programme has been a catalyst in enhancing institutional and human resource capacities.

GPHA's partnership with the UNCTAD TrainForTrade Port Management Programme has been both impactful and transformative. Since joining the English-speaking network, the Authority has actively participated in every cycle of the Modern Port Management Course. Our experts have served as local instructors and mentors, sharing their knowledge with emerging professionals from Ghana and other African countries. In return, GPHA has benefited from a steady pipeline of well-trained, globally oriented professionals who now contribute significantly to port efficiency and innovation.

Through the TrainForTrade Programme, GPHA has also participated in port performance measurement initiatives, enhancing transparency and accountability in our operations. These tools have enabled us to identify bottlenecks, improve cargo handling times, and strengthen stakeholder coordination.

One of the programme's high points was the introduction of SDGs and their relevance to port operations. This experience fostered greater awareness and integration of sustainability in strategic planning and daily decision-making.

Over the years, GPHA has hosted training activities for senior and middle managers and officers. This facilitated cross-sector collaboration among port users, including shipping agents, customs officials, and logistics providers. Ghana also stood out in the "Building Port Resilience Against Pandemics" online course, with significant numbers benefiting from this timely training on crisis preparedness and continuity planning.

Looking forward, GPHA remains committed to deepening its engagement with the TrainForTrade Programme. We see it as an essential platform for promoting innovation, peer learning, and inclusive growth within the global port community. Our vision is to ensure that Ghana's ports continue to evolve as smart, secure, and sustainable trade gateways — powered by people and partnerships.

Brigadier-General Paul Seidu Tanye-Kulono
Director General, GPHA

(A) Evaluation of Corporate Social Responsibility Policy and Implementation of the Ghana Ports and Harbours Authority

Ms. Flavia Amoasi (author), Human Resource Business Partner, GPHA

Mr. Samuel Ntow-Kummi (mentor), (retd.) General Manager Corporate Planning

Author biography

Prior to joining the GPHA, Ms. Amoasi worked in the banking sector as an Operations Manager. Since joining the Port Authority, she has served as a Senior Marketing and Corporate Affairs Officer where duties include making recommendations on Corporate Social Responsibility (CSR) applications to the Director General. She also co-hosted the only maritime television programme in Ghana called 'Eye on Port' which seeks to bring activities of the Port and the Maritime Industry closer to the public as well as to highlight the current trends in the maritime industry. As a result, Ms. Amoasi was nominated to attend the 15th Women in Port Management training in France sponsored by IMO. At the end of the training, she was selected to present a feature article on 'Women in the Maritime Industry' which was posted on the website of IMO and on its social media platforms.

Ms. Amoasi also worked as a Principal Protocol Officer where her core duty was to facilitate all foreign and local travel for the Board and staff of the Authority attending training courses and conferences. She presently works as a Human Resource Business Partner while also serving as a liaison officer between Management and staff.

> *Through this programme, I am able to do in-depth research into challenges in my department and provide appropriate recommendations to management. My research brought to the fore pertinent issues and practical recommendations which guides GPHA management in the implementation of its CSR Policy in line with the ISO 26000 guidelines to meet the SDGs.*

Introduction

The operation of seaports may frequently lead to the harmful environmental impacts on air, water and land. Therefore, port authorities have an important role to play in mitigating the adverse impacts of their activities on human health and the environment resulting from their operations. These negative effects on the environment can be mitigated through effective governance of CSR activities, whilst meeting the SDGs.

CSR is widely acknowledged as a valuable approach to building long-term relationships with both the internal and external stakeholders of an organisation. This has made it vital for institutions to formulate policies to serve as a framework in the achievement of their CSR goals.

Modern port practices reveal a commitment to both community and sustainability

As a port authority, the GPHA has an important role to play in the mitigation of its negative operational effects on the environment. Consequently, in its efforts to foster a cordial relationship with the communities in which it operates, GPHA formulated a CSR policy known as GPHA –Social Impact Policy (SIP).

GPHA-SIP seeks to build cordial and long-term relationship with all stakeholders and, particularly, the communities in which it operates and thereby promote business sustainability and growth. At the basic level, the GPHA-SIP seeks to bring beneficial impacts and outcomes from its CSR initiatives to the communities in its area of operation. The policy seeks to achieve this by focusing CSR programmes and initiatives on health, education and environment. Since the GPHA-SIP inauguration in 2015 almost 300 CSR projects have been undertaken. The total number of projects per sector in 2019 were: Education – 97; Environment – 92; and Health 33.

In conducting the research, an eight-member GPHA-SIP Committee was interviewed as well as a representative sample of six projects were selected for review by the author as follows:

- The Kofi Annan International Peace keeping Training Centre to build a training block for the institution.
- The Asuogyaman district to promote second cycle education in the district.
- The National Centre for Radiotherapy and Nuclear Medicine for the surgery of its patients.
- The clean coast and beach project.
- The Project Wheel of Hope for medical outreach and
- COVID-19 related activities.

Analysis

The objective of the study is to review the GPHA's CSR policy and evaluate the impacts of CSR projects on beneficiary communities.

The specific objectives of the study are broken down into four parts:

1. To review the GPHA-SIP against ISO 26000 standards.
2. To review CSR projects implemented by GPHA since the adoption of the GPHA-SIP.
3. To evaluate the impact of GPHA CSR projects on the beneficiary communities.
4. To examine the challenges facing GPHA-SIP policy implementation.

The GPHA-SIP aims at improving long-term community relations through education, health and environment programmes. The policy did not however state how these will lead to the ultimate goal of meeting the SDGs per the ISO 26000.

Although the GPHA performs CSR projects in the areas of Health, Education and Environment, the Policy does not define the specific outcomes that are expected from the implementation of these programmes. It is required that the GPHA-SIP link its initiatives to the realization of the relevant SDG Goals.

The study adopted a mixed method analytical approach by employing both qualitative and quantitative data. The review of the policy document was done by content analysis using the ISO 26000 as a benchmark. A purposive sample was used to select the respondents for the study who are part of the eight-member GPHA-Social Impact Committee. The study also sampled six beneficiaries, two respondents each from the core areas of health, education and environment as stated in the policy.

The study found that the GPHA-SIP does not conform to the ISO 26000 standards and guidelines on CSR and does not address issues of how the Authority will meet the United Nations (UN) SDGs through its policy initiatives. The ISO 26000 provides a practical framework for organisations to ensure that their activities are socially responsible and in agreement with the UN SDGs.

Findings and proposed opportunities for linkages of the GPHA CSR core areas, whilst taking into consideration the ISO 26000, towards achieving the SDGs are shown below:

1. The study shows that the three core areas are too broad hence, the policy should specify the exact areas to tackle under each core area to make CSR projects more effective in meeting the policy objectives.
2. The study revealed that CSR projects are neither monitored nor evaluated.
3. The study revealed that the GPHA has implemented various CSR projects since it adopted the GPHA-SIP in 2015.
4. The researcher found out that all GPHA projects undertaken for institutions and individuals were beneficial.

Recommendations

Thanks to the findings, the following recommendations were brought together:

1. GPHA should streamline its CSR policy (GPHA-SIP) in line with ISO 26000 guidelines. This will enable the organisation to meet the current demands in CSR and contribute its quota towards the UN Agenda 2030
2. The GPHA-SIP committee should be revamped and the roles and responsibilities of each member clearly defined in the policy document.
3. More CSR projects should be implemented with the view of mitigating the negative effects of the operations of the GPHA in its area of operation.
4. There should be a clear definition of what constitutes a CSR project by the GPHA.

Conclusion

Based on the findings of the study, it is concluded that the GPHA-SIP policy document does not fully align with the requirements and guidelines set out in ISO 26000. The implementation of GPHA's CSR projects also faces several challenges, with the identification and selection of suitable projects emerging as a key concern. Nonetheless, the study finds that the CSR projects that have been implemented have had a positive impact on the various beneficiary communities.

Impact and implementation

Following the recommendations, the CSR Policy Committee has been reconstituted and is currently in the process of reviewing the entire policy document and its implementation. The study creates clear linkages between effective management resulting in effective CSR in ports.

Sustainable Development Goals

The case study is a comprehensive effort in helping GPHA to carry out the missions of Goals 3, good health and well-being, 4, quality education, and 14, life below water. The study addresses the significant impacts that CSR have on local sustainable development. Among the issues to be addressed, it is necessary to review the policy of GPHA-SIP, ensure the committee is clear and aligned with ISO 26000, and make updates based on identified needs.

GPHA's health initiatives, such as medical outreach with the National Centre for Radiotherapy and Nuclear Medicine, the Project Wheel of Hope and COVID-19 related activities, will be enhanced with the development of CSR management.

Improving GPHA's-SIP will aid educational infrastructure and programmes through the documentation of investments. This is through the policies' projects with the Asugyaman district to promote second cycle education in the local district.

GPHA's clean coast and beach project will be positively impacted with the improvement of the Port Authority's CSR infrastructure, aligning with prevention of pollution and protecting the environment.

(B) Investigating the Impact of Delays in the Generation of Oil and Gas Invoices: A case of the Port of Takoradi

Mr. Edward Yao Ekuadzi (author), Principal Dry Bulk Terminal Officer, GPHA

Dr. Emmanuel Kofi Mbiah (mentor), Maritime Law Consultant, self-employed

Author biography

In 2003, Mr. Edward Yao Ekuadzi joined GPHA as a Mechanical Technical Supervisor, working across various sections of the Mechanical Engineering Department. While employed, he pursued diplomas in Transport, and later in 2013 he completed a master's degree in supply chain management from Coventry University.

In February 2014, Mr. Ekuadzi was transferred to the newly established Oil and Gas Department, where his hard work and dedication led him to rise through the ranks to become Principal Oil and Gas Officer. In April 2022, he transitioned to the Operations Department as a Stevedore Supervisor, overseeing cargo handling operations at the wharf. Most recently, in July 2024, he was appointed to the newly created Dry Bulk Terminal, where he is responsible for managing import operations.

Mr. Ekuadzi is a Chartered Member of the Chartered Institute of Logistics and Transport. Participation in the TrainForTrade Programme marks a key milestone in his professional journey, as he continues to lead and excel in his role as Principal Dry Bulk Terminal Officer at the Port of Takoradi.

> *The Port Management Programme played a key role in shaping my approach to port efficiency, stakeholder engagement, and strategic decision-making. The Programme has had a profound impact on both my professional development and port operations by equipping me with best practices in efficiency, sustainability, and leadership. The hands-on training and peer-learning approach strengthened my ability to optimize port logistics and cargo handling.*

Introduction

This study focuses on investigating the impact of delays in generating oil and gas invoices at the Port of Takoradi. Invoicing plays a critical role in the internal logistics chain of any business, as the timely and accurate issuance of invoices ensures efficient payment for services provided. When a supply vessel agent is unable to provide invoices to their principals for payment on time, it can lead to customer dissatisfaction and, subsequently, result in the loss of business to competing agencies.

The logistics chain for generating invoices for oil and gas vessels at the Port of Takoradi involves three key departments: Stevedore Department, Oil and Gas Department, and the Billing Department. The Stevedore Section is responsible for tallying discharged and loaded oil and gas equipment at the Wharf. The Oil and Gas Section is responsible for collating all necessary documents for a given cargo operation and generating summary data. The Billing Section is responsible for generating invoices based on the summary data received from the Oil and Gas Section. This dissertation seeks to study the existing process flow involved in generating invoices for oil and gas services and identifying the sources of delays. Additionally, it aims to explore the impact of these delays on both the Port Authority and the ship's agents.

The purpose of this study is to identify the root causes of delays in invoice generation for oil and gas vessels at the Port of Takoradi, assess their potential impact, and propose appropriate solutions. To achieve this, the study focuses on the following specific objectives:

1. To identify the root causes of schedule delays in the generation of invoices.
2. To evaluate the impact of these delays on the oil and gas service providers in the Port of Takoradi.

The study used the following approach to address the above objectives:

1. Design questionnaires for the three departments involved in the logistics chain of invoice generation for port users to understand the current process flow involved in generating invoices for oil and gas services and identify the sources of delays.
2. Review current literature from statutory bodies, such as the Ghana Maritime Authority and the International Maritime Organization, on invoicing. Additionally, parallel agencies, like the Ghana Revenue Authority, were included as part of the documentary review.
3. Interview staff from the three relevant departments, including managers at the stevedore, oil and gas, and billing sections, to gain insights into the services offered to port users by each department.

Analysis

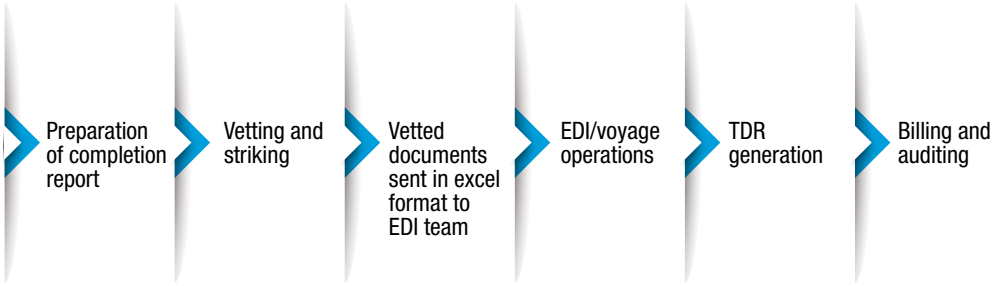
The study analysed the collected data, with a specific focus on the generation of oil and gas invoices at the Port of Takoradi.

The organisational profile revealed that 75% of the sample respondents work directly with GPHA, while the remaining 25% work as ship agents. The GPHA has three departments involved in generating oil and gas invoices, namely Oil and Gas, Stevedore, and the Monitoring Department. The agency results indicated that 29% of respondents work in the Oil and Gas, Documentation and Operations Departments.

The roles played by the respondents include the preparation of shipping documents, invoice generation, data gathering, electronic data processing, auditing, and more.

Figure III.1 illustrates the current process for generating a commodity summary to raise an oil and gas invoice.

Figure III.1
Current state value stream mapping for process of the generation of commodity summary



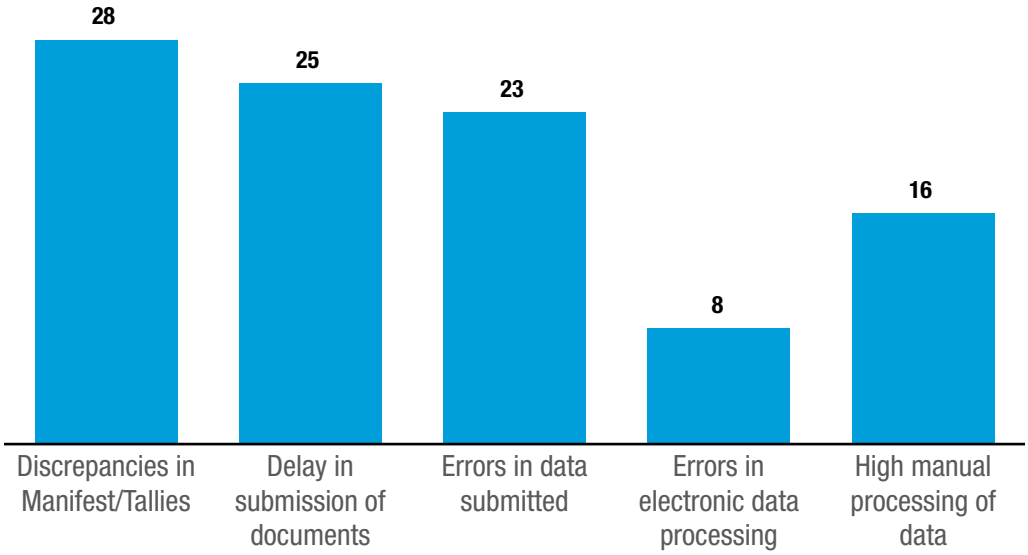
Source: Author

This study included a value stream mapping exercise to identify both value-added and non-value-added activities within the process. The entire value stream consists of 6 steps (as shown above in Figure III.1) and 19 activities. The study found that the average time spent to generate an invoice is approximately 1.92 working days.

Furthermore, the study analysed the causes of high lead times in each process step. For example, during the preparation of completion reports prolonged lead times were attributed to factors such as awaiting loading or discharging orders, equipment breakdowns, the shifting of vessels, and labour allocation. Similar causes were identified in other process steps, including discrepancies between tallies and manifests, inaccurate description of equipment, and delays in communication between supervisors and operators.

Figure III.2 presents the descriptive results of the author's question which asked survey participants: *What are some of the reasons why it takes a longer time to complete your work?*

Figure III.2
Causes of extended work timelines
(percentage)



Source: Author

The study also investigated the impact these delays have on the work of the agency. The descriptive statistics are presented in Figure III.3 in response to the question: *As an agency, what is the result of delayed invoices to your vessels?* The results showed that a majority of responses, 37%, selected the response: *Delayed payment of invoice by client to agency.*

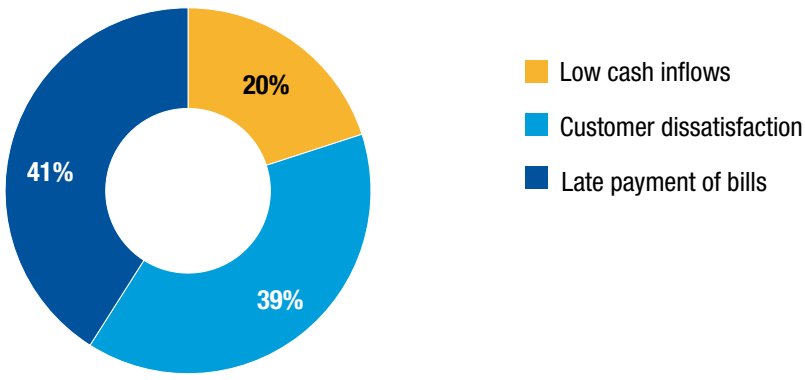
Figure III.3
Impact of delayed invoice on oil and gas shipping agents

	Frequency	Percentage
Delayed payment of invoice by client to agency	7	37
Late submission of final disbursement to clients	5	26
Low cash flow	2	11
Inefficiency	2	10
Loss of contract	3	16
Total	**19**	100

Source: Author

In a similar fashion, the study investigated the impact that delays in the generation of invoices might have on the work of the GPHA. The results showed (as displayed in Figure III.4) that *Late payment of bills by principals* was the most frequently cited issue, accounting for 41% of responses. This was followed by *Customer dissatisfaction* at 39%. *Low cash inflows* was cited by 20% of participants, being identified as the least significant indicator.

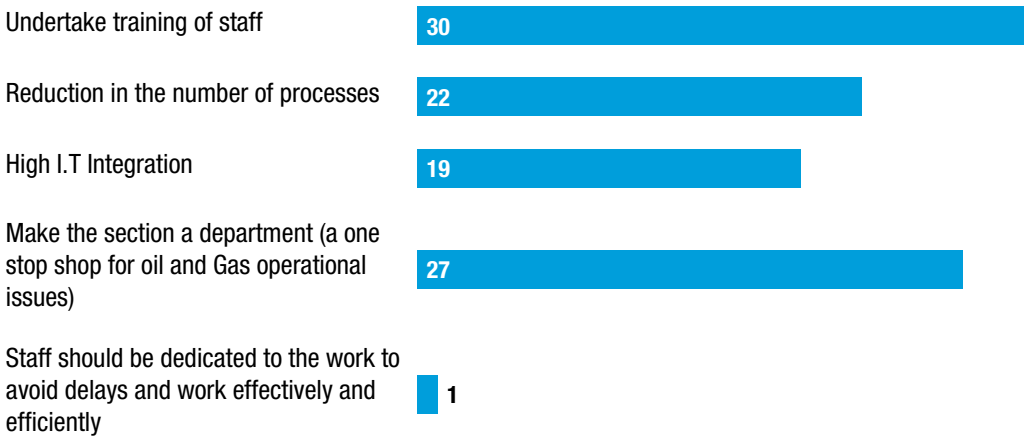
Figure III.4
Impact of delays in the generation of oil and gas invoices on the Port of Takoradi



Source: Author

This study also examined respondents' suggestions on how to reduce overall delays. The results showed that *training of staff* was the leading response at 30%. This was followed by *Make the section a department (a one stop shop for oil and gas operational issues)*, at 27%. *Reduction in the number of processes* accounted for 22% of responses. The remaining suggestions were *High IT integration* at 19%, and *Staff should be dedicated to the work to avoid delays and work effectively and efficiently*, which was the least cited, at 1%.

Figure III.5
Recommendations on how to avoid delays when generating invoices



Source: Author

Recommendations

Based on the findings obtained from the survey method and document analysis regarding the impact of delays on the Port of Takoradi, the study suggests the following practical recommendations:

1. **Undertake regular targeted training of staff:** Authorities should prioritise the continuous training and development of staff involved in the invoicing process to assist in reducing delays.
2. **Establish a dedicated department:** Designate a specific department within the port, serving as a one-stop-shop for oil and gas operational matters, including invoicing. This streamlined approach can enhance coordination and communication, leading to faster invoice processing.
3. **Simplify processes:** Identify opportunities to streamline and reduce the number of steps in the invoicing process. By minimising bureaucratic bottlenecks delays can be minimised, leading to quicker and more efficient invoice generation.
4. **Implement a high level of IT Integration:** Invest in advanced IT systems and technologies that enable smooth data exchange and integration across all stages of the invoicing process. Automation can significantly reduce manual errors and expedite the overall process.
5. **Foster dedication in staff:** Assign invoicing responsibilities to dedicated staff to minimise distractions and ensure timely, efficient task completion.

By implementing these recommendations and continuously monitoring and improving the invoicing process, the Port of Takoradi can significantly reduce delays, enhance operational efficiency, and support broader sustainable development objectives.

Figure III.6 below shows the steps taken within GPHA to implement the recommendations emanating from this case-study:

Figure III.6
Record of recommendations implemented by the management of the Ghana Ports and Harbours Authority.

Recommendations	Actions by management of GPHA
Undertake regular targeted training of staff.	In-house training for the Master Terminal Implementation Committee delivered 15 to 20 June 2023.
	In-house training for staff in Port Operations and Management delivered from 10 to 24 July 2023.
	Training in Dubai from 23 to 27 July 2023 for Management and Safety Officers re international safety standards for Oil and Gas Marine Operations.
Establish a dedicated department: serving as a one-stop-shop for oil and gas operational issues, including invoicing.	Management decision taken to establish the Oil and Gas Operation as a distinct department of the Port by 2024 – after the completion of the expansion works on the new oil and gas terminal.
Simplify invoicing processes to deliver more efficient and effective services to customers and GPHA Management.	A Committee has been set up to review the workflow of the entire billing process. The committee is expected to complete it work by September 2023.
Implement a high level of IT Integration.	Budget allocation has been made to procure hand-held devices, to augment the prompt collection of data at the wharf.
Foster dedication in the invoicing staff to encourage focus on prompt and efficient customer service.	Relevant training for invoicing staff has focused on their needs so that they can best meet customer expectations.

Source: Author

Conclusion

The findings of this study highlight the negative impacts that delayed invoices have on both agencies and the Port of Takoradi. The causes of these delays have been identified as *Discrepancies in Manifest/Tallies*, *Delay in submission of documents*, *Errors in data submitted*, *High manual processing of data*, and *Errors in electronic data processing*. These delays have far-reaching consequences, particularly on cash flow, which directly affects the financial performance of both the Port and oil and gas agencies operating within it.

One of the major consequences of delayed invoices is the creation of a backlog of pending invoices, leading to further delays and increased administrative costs. This exacerbates the financial strain and operational inefficiencies for all parties involved. Moreover, the study has shed light on how these delays can lead to customer dissatisfaction among clients of shipping agents, consequently impacting the timely release of disbursement funds by their principals.

To address these issues, it is crucial for all stakeholders to collaborate and implement measures aimed at streamlining the invoicing process. Promoting electronic data processing, reducing manual data handling, and improving document submission protocols are all potential solutions that could alleviate the burden of invoice delays.

By addressing the identified causes and implementing appropriate solutions, the Port of Takoradi and associated agencies can significantly improve their operational efficiency, financial performance, and overall customer satisfaction. This will help foster a more seamless and productive environment for all parties involved in the port operations and positively impact the region's economic growth.

Sustainable Development Goals

This study examines the systemic delays in generating oil and gas invoices at the Port of Takoradi and the ripple effects on operational efficiency, financial performance, and customer satisfaction. By identifying root causes such as manual data handling, document discrepancies, and communication gaps, targeted recommendations are provided — including technological integration, workflow simplification, and organisational restructuring to streamline the invoicing process. These proposed changes not only enhance the port's operational capacity but also align with the UN SDGs in support Goal 9, industry, innovation and infrastructure, and Goal 12, responsible consumption and production, contributing to sustainable economic growth in the region.

The study greatly contributes to increasing efficiency in infrastructure for the Port of Takoradi, specifically through the establishment of a dedicated department and request for higher IT integration.

Improving port efficiency and managing invoices effectively can support responsible production and consumption through sustainable operations. This allows ports to deliver services to clients more quickly and efficiently.

(C) Reducing Marine Pollution in the Port of Tema

Mr. Lonsdale Ocloo (author), Principal Estate & Environment Officer, GPHA

Mr. Daniel Asare (mentor), Corporate Estate & Environment Manager, GPHA

Author biography

Lonsdale Ocloo graduated from the College of Art & Built Environment, Kwame Nkrumah University of Science & Technology (KNUST), Ghana with a BSc in Human Settlement Planning. The objective of the Programme is to train professionals required for the planning and management of the growing urban and rural settlements in Ghana. Mr. Ocloo is currently pursuing an MSc in Facilities Management at KNUST.

At GPHA, Mr. Ocloo works in the Estate and Environment Department, Headquartered as the Principal Estate & Environment Officer. The department's responsibility is to manage the Authority's Properties and Environment sustainably through accepted best practices to attain optimal economic, social, and environmental returns. Mr. Ocloo acts as the ISO Functional Quality Manager for the department to ensure the department's compliance with ISO standards requirements (ISO9001:2015, ISO14001:2015, & ISO45001:2018).

His experiences, both in university and in the workplace, have made him appreciate proper environmental management as a need is vital for survival. The ramifications of mismanagement or no management can be very severe with adverse impacts on workers and the environment in general.

> *Considering how quickly the maritime industry is changing, I saw this as an opportunity to learn new things that could help my port become more efficient. Since completing the Programme, my career has evolved significantly. I have taken on greater responsibilities in my department. The Programme equipped me with the skills to support the implementation of sustainable initiatives like Waste Segregation Program and Air Quality Monitoring in our port. It has also strengthened my ability to engage stakeholders on sustainability issues, ensuring that environmental considerations are integrated into port development projects at all times.*

Introduction

This study examined the various causes of marine pollution in the Port of Tema alongside their associated problems. The study also assessed the current management initiatives in place and evaluated their effectiveness. The overall intent was to propose sustainable solutions, recommendations, and an action plan to help reduce marine pollution in the Port of Tema.

In this time of increasing environmental awareness and the drive for sustainability, seaport operations are expected to have minimal impact on the environment. This is crucial because of the waterfront location which is known to be highly sensitive to the damaging impacts from multiple sources of pollution. It has been observed that the ramifications of mismanagement results in long-lasting environmental damage, with severe consequences for life both underwater and on land.

According to the Group of Experts on the Scientific Aspects of Marine Environmental Protection (1990) of IMO, Marine Pollution is "the introduction by man, directly or indirectly, of substances or energy into the marine environment (including estuaries) resulting in such deleterious effects as harm to living resources, hazards to human health, hindrance to marine activities including fishing, impairment of quality for use of sea water, and reduction of amenities".

Marine Pollution is caused by human activities both on land and at sea. According to estimates from UNESCO (2017), almost 80% of marine pollution worldwide comes from land-based sources, while 20% originate from activities at sea. Marine pollution is gradually contributing to "Dead Zones," areas in the ocean known as regions with little or no oxygen to sustain marine life. The Commonwealth Secretariat (2019) estimated that there are about 500 of these Dead Zones around the world.

Marine Pollution at seaports may therefore be referred to as the introduction of hazardous substances into the aquatic environment through accidental spillages, discharge of untreated industrial outflows, port construction, and other operational activities. The accumulation of these harmful substances poses a serious threat to the marine environment.

Analysis

In June 2021, the Meridian Port Service (MPS), a terminal operator in the Port of Tema engaged the Water Research Institute of the Council for Scientific and Industrial Research to conduct a comprehensive series of water testing in some of the streams and pathways into the port waters. 24 parameters were tested against the Ghana Standards Authority (GSA) standard, while 5 other parameters were also tested against the Environmental Protection Agency's (EPA) permissible limits. The laboratory tests focused on Organics, Solids, Nutrients, and Physical Properties present in the water.

The results showed that out of 24 parameters tested, 9 exceeded the GSA's permissible limits (GS1212:2019). These 9 parameters include Turbidity, Total Suspended Solids, Alkalinity, Total Phosphorus, Total Nitrogen, Ammonia, Oil/Grease, Biochemical Oxygen Demand, and Chemical Oxygen Demand. It was also observed that Mercury and Arsenic parameters were on the same level as the GSA's permissible limits. The table below is a summary of the test results.

Figure III.7
List of pollutants beyond the Permissible Limits of the Ghana Standards Authority (GS 1212:2019)

Parameters	Test Results	GS 1212:2019	Variance (%)	Remarks
Turbidity (mg/l)	181	75	141	Exceeded
Total Suspended Solids (mg/l)	125	50	150	Exceeded
Alkalinity (mg/l)	227	150	51	Exceeded
Total Phosphorus (mg/l)	15	2	660	Exceeded
Total Nitrogen (mg/l)	158	0	58	Exceeded
Ammonia (mg/l)	44	1	4 330	Exceeded
Oil / Grease (mg/l)	8	5	60	Exceeded
Biochemical oxygen demand (BOD) (mg/l)	71	50	42	Exceeded
Chemical oxygen demand (COD) (mg/l)	266	250	6	Exceeded
Mercury (mg/l)	0	0	0	Same Level
Arsenic (mg/l)	0	0	0	Same Level

Source: Author

Inter-agency collaboration is crucial to ensuring sufficient information sharing

Additionally, another set of parameters was also tested against the EPA's maximum permissible levels. These included Total Coliform, Faecal Coliform, E. Coli, Salmonella, Vibro, and Staphylococcus.

Out of the 5 tested, 3 were beyond the EPA's maximum permissible levels. The results of the other 3 tests which exceeded the EPA standards are shown in the table below.

Figure III.8
List of Pollutants beyond the Permissible Limits of the Environmental Protection Agency

Sample Identification	Test Results	EPA Limits	Remarks
Total Coliform (cfu/100ml)	558 X 104	400	Exceeded
Faecal Coliform (cfu/100ml)	128 X 104	<10	Exceeded
E. Coli	48 X 104	10	Exceeded

Source: Author

The two tables show that a substantial amount of pollutants flow into the port waters, threatening the marine environment. The situation necessitates more stringent regulation of land-based activities in the Port and adjoining Metropolis. The Port must therefore enforce strict adherence to established Standard Operating Procedures (SOPs) for its operational activities while the Local Authority intensifies regulatory supervision of activities within its jurisdiction to help minimise the discharge of harmful pollutants. The following photographs graphically illustrate the seriousness of the pollution menace within the Port of Tema.

Occasional discharge into the harbour basin

Raw sewage discharge into the harbour basin

State of the Chemu lagoon

Plastic litter in the harbour

Traces of oil along the breakwater

It has become obvious that the marine pollution menace can be related to multiple activities on both land and sea parts of the Port. This presupposes that a multi-faceted approach will be prudent in addressing this problem. Inter-agency collaboration is also crucial since it will help ensure sufficient information sharing as well as the adoption of effective and sustainable measures to tackle the problem.

Recommendations

The recommended solutions to the marine pollution threat include:

- the enforcement of wastewater treatment;
- deployment of litter booms or interceptors in ocean-bound water bodies;
- adherence to standard operating procedures in port operations;
- sensitisation of the port community;
- provision of adequate spillage containment equipment;
- zero-tolerance to cases of abandoned vessels;
- assisting in the repairs of malfunctioning sewage treatment plants;
- adherence to the authority equipment replacement policies
- enhanced monitoring of bunkering activities.

Conclusion

In conclusion, the Port Authority must do more than only focus on achieving its economic goals while neglecting environmental and social protection. GPHA, in collaboration with other relevant agencies, must therefore vigorously implement the proposed recommendations indicated above to help attain environmental sustainability across Port Operations.

Impact and Implementation

The Port Authority and MPS engaged the Tema Metropolitan Assembly (TMA) over the threat of marine pollution. To help identify a sustainable solution to the issue, TMA established a technical body called the "Marine Pollution Committee" that includes all pertinent stakeholders. The Metro Development Planning Officer, Mr. Samuel Nomo Lawer, serves as the committee's chairperson.

The Ghana Ports & Harbours Authority, Ghana Maritime Authority, Meridian Port Services, PSC Tema Shipyard, Association of Ghana Industries, National Disaster Management Organization, Tema Landing Beach, Marine Police, Ghana Navy, and the Environmental Protection Agency are among the stakeholders constituting the committee. A work plan has been prepared by the technical committee and submitted to the Local Authority for approval and execution.

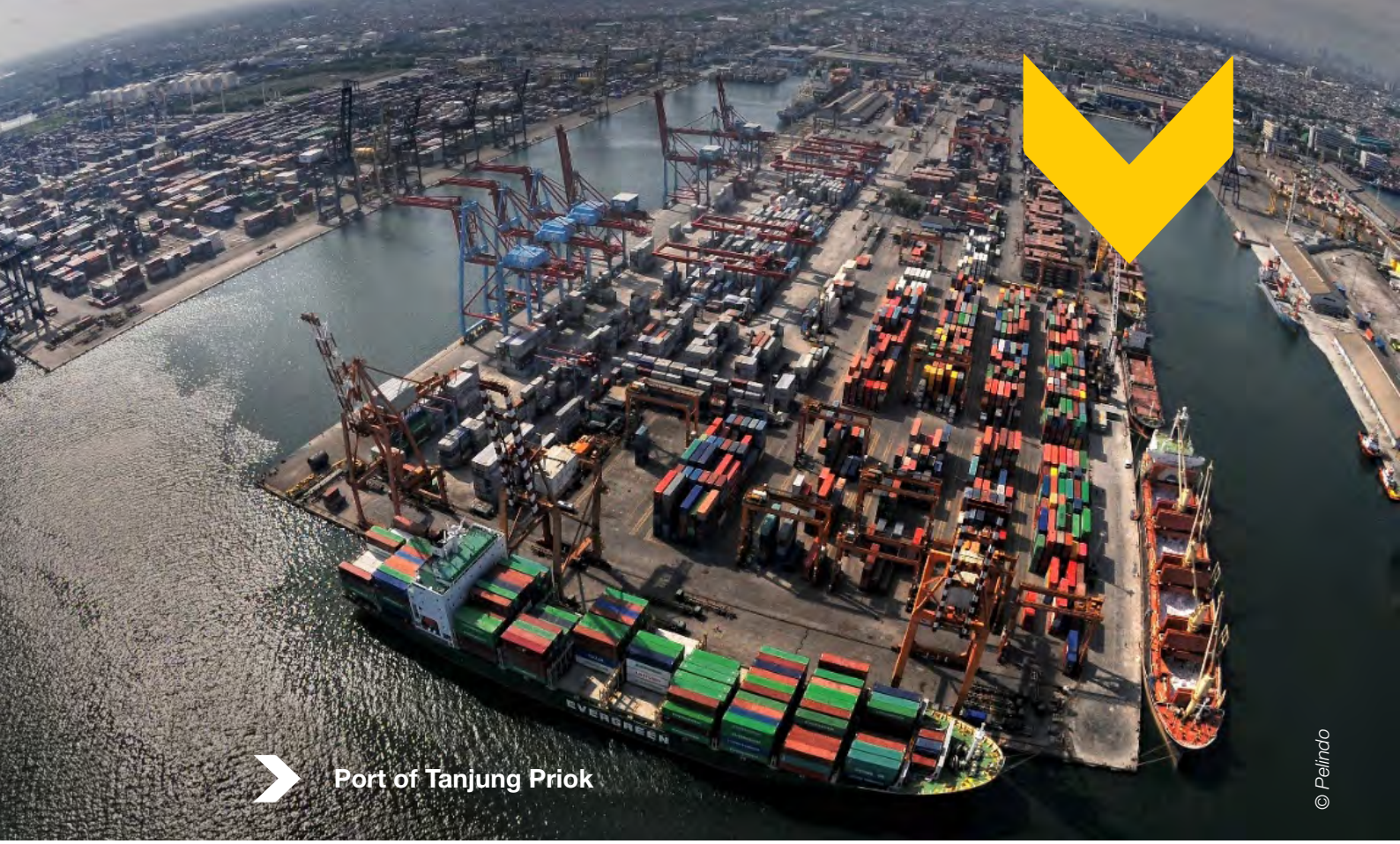
Sustainable Development Goals

Protecting Tema Port's marine environment is crucial as it aligns with Goal 6, clean water and sanitation, and. Goal 14, life below water. This study also contributes to the government of Ghana's plan of making Accra the cleanest city in Africa.

The study directly addresses the contamination of port waters and surrounding water bodies, focusing on reducing pollutants such as oil, grease, ammonia, coliform bacteria, and suspended solids. By recommending measures like wastewater treatment enforcement, spillage containment equipment provision, and enhanced monitoring of bunkering activities, the study promotes the protection and sustainable management of water resources.

The study also targets the reduction of marine pollution in the Port of Tema, which directly threatens aquatic life and coastal ecosystems. Through measures such as deploying litter booms, enforcing standard operating procedures in port operations, and enhancing the monitoring of activities like bunkering, the study promotes the conservation and sustainable use of oceans and marine resources, helping to protect biodiversity and sustain the blue economy.

The implementation of the proposed recommendations will also lead to other benefits like; the protection of the Blue Economy, enhanced corporate image, enhanced port-city relations, promotion of environmental sustainability and compliance with national, regional, and international marine pollution conventions. Recognising the diverse and complex nature of the marine pollution challenge, the Port Authority has begun engaging with the local authority on a way forward. A Marine Pollution Committee has been established, comprising representatives from relevant stakeholder institutions to develop sustainable solutions aimed at reducing pollution in both the port and the wider metropolis.



Port of Tanjung Priok

© Pelindo

Indonesia (Pelindo)

Before the merger, port operations in Indonesia were managed by four different state-owned enterprises (Pelindo I, II, III, and IV), which were less coordinated on a national scale, leading to inefficiencies in operations and management. Service standards and operational procedures varied across ports, causing disparity in service quality. Additionally, port infrastructure development was suboptimal as priorities and strategies differed among entities, creating unalignment that affected connectivity and the national logistics supply chain.

The merger of the four state-owned ports into PT Pelabuhan Indonesia (Persero), or Pelindo, has been effective since October 1st, 2021. This aimed to improve operational efficiency through operational standardisation and digitalisation initiatives. By centralising management, Pelindo eliminated operational overlaps and simplified business processes, strengthening synergies between ports.

The merger maximized the strategic potential of Indonesian ports within global trade routes, making Pelindo the sole state-owned enterprise, managing 140 business units across 71 branches in 32 provinces. Pelindo has become Indonesia's leading port operator and Southeast Asia's second-largest container terminal operator, commanding 95% of the domestic container market with an expected throughput of 18.8 million TEUs in 2024.

Following the merger, Pelindo has evolved into a more cohesive, efficient, and strategically focused organization. Pelindo's post-merger transformation brings numerous benefits to stakeholders as it reduces port stay, optimises berth windows, and lowers ship rental costs for customers. Nationally, Pelindo’s transformation contributes to improving maritime connectivity and reducing logistics costs.

Figure III.9
Pelindo Work Area

Source: Pelindo

To enhance core competencies of business, Pelindo established four sub-holdings; PT Pelindo Terminal Petikemas for managing container operations; PT Pelindo Multi Terminal for handling non-container services such as liquid bulk, dry bulk, and general cargo; PT Pelindo Jasa Maritim for providing marine, equipment, and port services; PT Pelindo Solusi Logistik for developing logistics and industrial areas and for integrating ports with industrial zones to establish a connected ecosystem. This strategic focus allows Pelindo to manage operations in specialised clusters, create synergies across sectors, and provide clear accountability and more focused approach within each business segment.

Pelindo actively aligns its efforts with the Sustainable Development Goals, contributing to goals such as decent work and economic growth (SDG 8), infrastructure innovation (SDG 9), and climate action (SDG 13). Through green port initiatives, carbon emission reductions, and renewable energy adoption, Pelindo addresses climate challenges while driving industrial growth. Its contributions to economic stability and inclusivity highlight the importance of SDG alignment in ensuring long-term societal and environmental balance.

Pelindo leads the maritime sector through operational integration, capacity growth, and digital technology investments. Through these initiatives, Pelindo has positioned itself as a catalyst for economic growth, creating synergies between national and international markets. By supporting sustainable development, driving inclusivity, and enhancing logistics infrastructure, Pelindo ensures long-term benefits for industries, communities and the broader economy, solidifying Indonesia's role as a key player in global maritime trade.

Tonnes of trade
201 182 095

TEUs
18 800 000

© Pelindo

Pelindo, or PT Pelabuhan Indonesia (Persero), is a state-owned company responsible for managing ports across Indonesia. As a key player in the national maritime logistics sector, Pelindo aspires to be the leader of an integrated and world-class maritime ecosystem. Leveraging Indonesia's strategic position on international trade routes, Pelindo focuses on innovative port management to support Indonesia's vision of becoming a global maritime hub. In its mission, Pelindo consistently works to improve logistics connectivity, service integration, and the competitiveness of national ports in the global market.

Since the merger of four state-owned port entities into a single company, Pelindo has achieved significant advancements in port management. This transformation aims to create greater synergy among ports throughout Indonesia. As a strategic initiative, Pelindo has also prioritised lowering logistics costs to strengthen supply chain connectivity and enhance the competitiveness of Indonesian ports in the global arena.

Pelindo's contributions extend beyond operational achievements, as it plays a vital role in driving national economic growth and strengthening Indonesia's position in the international maritime industry. Domestically, Pelindo facilitates trade by connecting key economic regions and enhancing the movement of goods. Internationally, Pelindo's strategic role in global shipping routes supports international trade and promotes Indonesia as a reliable partner in the global maritime logistics network.

As part of its collaboration with the UNCTAD TrainForTrade initiative, Pelindo actively participates in PMP. This program is designed to enhance port management capabilities across various dimensions such as port planning, logistics, security, environmental protection, and digital solutions. Looking ahead, Pelindo envisions the PMP evolving further by preparing training materials that equip participants with strategic, holistic, and agile thinking skills, while also fostering collaboration and diversity. These attributes are critical for addressing complex operational challenges and adapting to the ever-changing dynamics of the maritime industry. Furthermore, Pelindo hopes that the curriculum of PMP will expand to cover topics specific to terminal operations, providing participants with deeper practical insights and innovative solutions within terminal management.

In line with its commitment to sustainable development, Pelindo's commitment to achieving sustainability is carried out through three strategic stages, forming a transformative journey that is structured and progressive. The first stage, marked by collaboration and synergy among human resources, serves as a solid foundation in driving strategic transformation. The second stage reflects a strengthened focus on sustainability programmes, ensuring that every initiative undertaken delivers tangible impact. The third stage is the result of the foundation and strategies that have been built, leading to the establishment of Pelindo as a sustainable, innovative company that positively impacts the industry, society, and the environment.

Through these various efforts, Pelindo demonstrates its commitment to being a major driver in building an integrated, competitive, and sustainable maritime ecosystem for Indonesia. With support from international training, technological integration, continuous innovation, and a dedication to fostering creativity, Pelindo not only contributes to national economic growth but also strengthens Indonesia's position as a global maritime power.

Mr. Arif Suhartono, President Director PT Pelabuhan Indonesia (Persero)

(D) Utilization of Geographical Information Systems to Improve Property Management and Monitoring

Mr. Rizal Khan, Head of Reporting System Department, PT Pelabuhan Indonesia (Persero)

Mr. Agung Eka Wardhana, Vice President, PT Pelindo Terminal Petikemas

Author biography

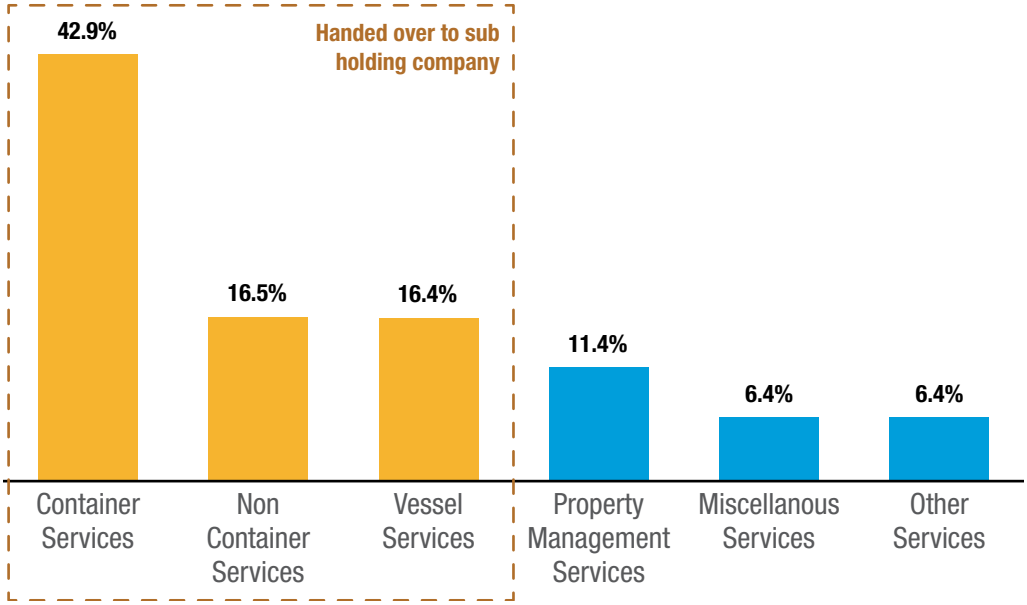
Mr. Khan is an experienced manager with 15 years of expertise in the port industry, specialised in Information Technology, Business Development, Human Resources Management, and Port Operations.
With a Master of Science (MSc) in Port Management from Liverpool John Moores University, United Kingdom, and multiple certifications from renowned organisations, he has developed a strong foundation in port management and operational efficiency.
Mr. Khan's career has been driven by a commitment to innovation, strategic development, and excellence in the maritime sector. He is eager to expand his global network and deepen his experience in international port management, contributing to the growth of the maritime industry while promoting best practices worldwide.

"The Programme provided invaluable insights into the complexities of international port operations and their crucial role of global supply chains.

Introduction

The study explores the utilisation of Geographic Information Systems (GIS) to enhance property management and monitoring in Region 3 of PT Pelabuhan Indonesia (Persero). Following the 2021 merger that consolidated four port companies, four sub-holding companies were developed to manage container services, non-container services, vessel services, and logistics services. Property management (land and buildings) emerged as a critical revenue stream for Pelindo as it represents the largest remaining source of income, as shown in Figure III.10. However, inefficiencies in property contract renewals and the underutilisation of idle properties hinder revenue generation. By integrating GIS tools, the study aims to improve property monitoring, streamline decision-making, and enhance the visualisation of key property indicators.

Figure III.10
Top 6 Revenue Streams



Source: Pelindo's Annual Report, 2022

GIS technology is widely recognised for its ability to present complex spatial data in an intuitive manner. The dissertation employs the Relative Importance Index to determine crucial property indicators, evaluates multiple GIS tools through cost-benefit and SOAR analyses (Strengths, Opportunities, Aspirations, Results), and proposes an implementation framework for GIS integration. The overarching goal is to reduce overdue contract renewals, optimise property utilisation, and unlock an estimated 38.3 billion Indonesian rupiah (IDR) in potential revenue.

Analysis

The study begins by examining Pelindo's property management challenges, including difficulties in locating assets, tracking contract renewals, and promoting idle properties. A survey conducted with property management personnel in Region 3 highlighted that 55% of respondents perceived overdue contract renewals as a high risk, while 64% believed that enhanced property visualisation could increase revenue by 5-10%.

Using the Relative Importance Index method, key indicators were ranked based on their significance for GIS visualisation as shown in Figure III.11. The six most critical indicators—geographic location, property status, land certificate type, area, contract value, and contract period—were prioritised for integration into the GIS dashboard.

Figure III.11
Indicators and Relative Importance Index Scores

Data	Relative Importance Index	Rank
Geographic Location	0.72	1
Property Status	0.71	2
Type of Land Certificate	0.71	3
Area in m2	0.69	4
Contract Value	0.69	5
Contract Period	0.68	6
Tenant	0.67	7
Purpose of Land/ Building	0.65	8
Property Condition	0.64	9
Address	0.61	10
Access Road	0.60	11
Distance to City Centre	0.59	12
Surrounding Area	0.59	13
Land Topography	0.56	14
Water Drain	0.53	15

Source: Author

A comparative analysis of GIS tools, including ePropertyPlus, ArcGIS, Maptitude, Canvas X Geo, and PowerBI, identified PowerBI as the most suitable option. PowerBI was selected due to its interoperability, cost efficiency, and existing implementation within Pelindo's IT infrastructure. Additionally, a SOAR analysis highlighted the strengths (GIS visualization capabilities), opportunities (financial and operational efficiency), aspirations (seamless integration with existing systems), and expected results (enhanced monitoring and revenue generation).

The study proposes a GIS mock-up, which consists of two main dashboards:

1. **Idle Land and Building Dashboard** – Provides insights into unutilised assets using geospatial mapping and financial estimations to support leasing efforts.
2. **Land and Building Contract Dashboard** – Tracks contract expiration periods through color-coded alerts, ensuring timely renewals and revenue continuity.

Recommendations

Key recommendations include:

- Implementing GIS-based dashboards with automated notifications for contract renewals.
- Conducting training programmes to familiarise personnel with the new system.
- Establishing a phased rollout strategy, starting with Region 3 before expanding company-wide.

The proposed GIS implementation is designed to streamline property monitoring and decision-making within Pelindo's Region 3. The system will enable real-time tracking of property assets, ensuring that management teams can respond proactively to contract expirations and optimise land utilisation.

By improving visualisation and accessibility of property data, the project will contribute to increased revenue generation through better asset promotion and leasing. The integration of PowerBI, which is already in use within Pelindo, ensures a cost-effective implementation with minimal disruption to existing workflows. The roadmap for implementation includes three phases: preparation, system development, and deployment, supported by IT consultants and internal teams.

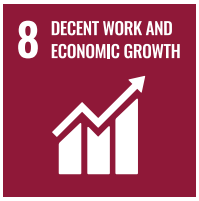
One of the most memorable aspects of my journey was the opportunity to engage with professionals from diverse backgrounds, exchanging best practices and learning from real-world case studies.

Conclusion

The findings demonstrate that GIS can significantly enhance Pelindo's property management efficiency by offering real-time spatial insights and improving contract monitoring. The integration of PowerBI into property management workflows is expected to reduce overdue renewals, streamline decision-making, and support revenue optimisation efforts.

Future research could explore the integration of advanced GIS analytics, such as predictive modelling for land utilisation and AI-driven asset valuation.

Sustainable Development Goals



By promoting idle land for development, the study also aligns with Goal 8, decent work and economic growth, fostering new business opportunities and increasing economic activity in port regions. Additionally, new business creation is encouraged by developing idle land, simulating economic activity across port regions.

This project aligns with Goal 9, industry, innovation, and infrastructure, in that it leverages technology to enhance infrastructure management and promote sustainable industrialisation. The implementation of GIS fosters innovation in property management, supporting digital transformation within the port sector. These actions are not only necessary for sustainable development but are also necessary for ports to remain modern and competitive.

The initiative contributes to Goal 11, sustainable cities and communities, by improving the efficient use of land assets, facilitating better urban planning, and ensuring that industrial and commercial spaces are optimally managed. Improving land use and urban planning ensures efficient and effective use of property, allowing ports to develop further across lesser used areas.

(E) Analysis of Business Operations Expansion under the Indonesia Port Corporation Car Terminal: Connectivity Strategy in Indonesia's Car Terminal

Ms. Endah Dwi Liesly Puspita Sari (author), Senior Manager Corporate Secretary at the Indonesia Port Corporation Car Terminal, Terminal Kendaraan

Mr. Rio T. N. Lasse (mentor), Director of Operations and Transformation of PT ASDP Indonesia Ferry (Persero)

Author biography

Ms. Dwi Liesly Puspita Sari began her port career in 2010 with state owned PT Pelabuhan Indonesia II (Persero). Previously, she worked in the private sector as Fast-Moving Consumer Goods Product Development Unit Head at PT Mandom Indonesia Tbk. At Pelindo, she spent 5 years as an Assistant Manager of Customer Service in PT Pelabuhan Tanjung Priok, 2 years as Deputy Vice President of Non-container Customer Relations, 1 year as Head of the Marketing Department at Pelindo Region 2, 1.5 years as a Senior Manager Strategy and Business Development at PT Indonesia Kendaraan Terminal Tbk/IPCC, and 1.5 years as a Corporate Secretary at the Indonesia Port Corporation Car Terminal (IPCC) before her current position.

Ms. Dwi Liesly Puspita Saris is a motivated results-oriented individual with a strong background in consumer goods product development and port customer relationships management. She has demonstrated her ability to formulate long-term corporate business plans, develop and expand business for RoRo terminal operations at IPCC Balikpapan, develop new business for the pre-delivery center for automaker cargo at IPCC Jakarta, and her new responsibility as a listed company Corporate Secretary in charge of leading three departments: Corporate Communication and CSR, Investor Relations, and Legal & Compliance.

Introduction

Based on the economic outlook and projections for 2021–2023, the automotive market in Southeast Asia is expected to continue growing, despite the global economic slowdown. This economic trend presents a strong opportunity for the region, particularly Indonesia, as automotive production capacity remains underutilised.

As Indonesia's largest car terminal, IPCC plays a critical role in the supply chain—not only by connecting land and sea transport, but also by ensuring seamless intra-port connectivity. To prevent bottlenecks in cargo flow, IPCC must prioritise maintaining and optimising terminal capacity. In addition, service quality, logistics costs, and service time are key performance factors that must be improved to strengthen the competitive advantage of the IPCC in the national automotive sector.

> Ports are the driving force behind seamless, sustainable connections across land and sea

By strengthening its competitiveness, IPCC can attract more automotive manufacturers to invest and establish domestic production facilities. To capitalise on rising demand, particularly for Completely Built-Up vehicles, and leverage the improved connectivity resulting from the Pelindo port merger, IPCC should evaluate terminal and port opportunities across the Pelindo regions, from Sabang to Merauke. By expanding its operational footprint, IPCC can not only reduce market competition, but also enhance its strategic positioning and gain access to new markets.

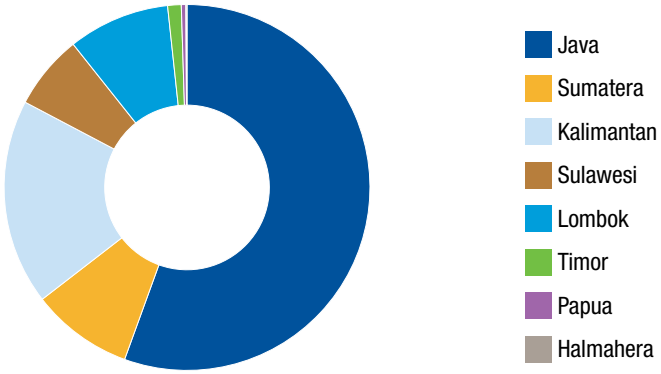
Analysis

Following the Pelindo merger, the company was restructured into four regional divisions, comprising 71 port branches across Indonesia, from Sumatra to Papua. To assess the potential of future IPCC operations, an initial mapping was conducted to identify branches with recorded throughput in vehicle loading and unloading activities. The data included combined throughput figures for passenger vehicles and trucks transported via Roll-on/Roll-off (RoRo) vessels.

Among the 71 port branches, 38 were identified as actively handling vehicle cargo from 2021 to 2022. The majority of these branches are located in Regional division 3 (42% or 16 ports) and Regional division 4 (29% or 11 ports), while the rest are found across Regional divisions 1 (5 ports) and 2 (6 ports).

For a more effective analysis, the study first narrowed the focus from 71 branches to 38 based on their vehicle cargo throughput. Following another screening process, the list was narrowed down to 26 branches. From this, seven priority ports were identified based on throughput rankings: Tanjung Perak (Surabaya), Lembar (Lombok), Tanjung Wangi (Banyuwangi), Trisakti (Banjarmasin), Tanjung Emas (Semarang), Dumai, and Gresik.

Figure III.12
Pelindo vehicle distribution, 2022



Source: Author

According to the Association of Indonesian Automotive Industries vehicle distribution data, demand is heavily concentrated on Java Island. Jakarta leads with 18.6% of national distribution, followed by West Java (13.2%) and East Java (10.5%). Accordingly, among the 38 Pelindo port branches, Java accounts for 42.5% of total vehicle throughput (396,259 units), followed by Sumatra (13.9% or 129,092 units), Kalimantan (8.5% or 80,560 units), Sulawesi (6.8% or 63,549 units), Papua and Maluku (1.2% or 9,146 units), and the Nusa Tenggara Islands (0.8% or 7,368 units). In total, six Java-based ports: Tanjung Priok, Banten, Tanjung Perak, Tanjung Wangi, Gresik, and Tanjung Emas play a significant role in vehicle cargo handling.

To further refine port prioritisation, the study employs provincial economic growth as a reference point to assess regional market potential. Key indicators include the inflation rate, Gross Regional Domestic Product (GRDP), and the percentage of the productive-age population (ages 15–64).

While most provinces experienced an increase in inflation in 2022 compared to 2021, the rates remained below the national average of 5.5% year-over-year, which was mainly driven by government-regulated price increases. GRDP levels grew across all provinces in 2022, although the majority remained below the national GRDP. Notably, seven provinces—Riau, Riau Islands, Jakarta, Central Kalimantan, East Kalimantan, North Kalimantan, and West Papua—have surpassed the benchmark for national GRDP. These provinces collectively host 11 Pelindo port branches, highlighting their strategic economic importance.

Furthermore, data from Statistics Indonesia (2020) show that 69% of the country's population falls within the productive age range of 15–64, signalling strong growth potential in all provinces. For the automotive industry, this demographic trend offers a compelling opportunity for vehicle manufacturers to increase production and vehicle ownership ratios nationwide.

Recommendations

Based on the mapping and analysis of cargo throughput data alongside key economic indicators, the following strategic recommendations are proposed for the IPCC:

1. **Leverage growth in the automotive sector**

The automotive industry in Indonesia continues to demonstrate a positive trajectory, given the opportunities to scale up vehicle production and expand national distribution networks. It is strongly suggested that the IPCC position itself to capitalise on this opportunity by enhancing its operational coverage and service capabilities.

2. **Implement business purification and operational expansion**

As part of the business purification initiative, the IPCC has selected 13 port branches to be managed as car terminal operators in the future. The operational handover for these branches is expected to be completed by 2025, allowing for a structured and phased expansion of the footprint of IPCC.

3. **Prioritise seven key port branches**

Seven port branches—Tanjung Perak (Surabaya), Lembar (Lombok), Tanjung Wangi (Banyuwangi), Trisakti (Banjarmasin), Tanjung Emas (Semarang), Dumai (Riau), and Gresik (East Java)—have emerged as promising candidates for a gradual terminal expansion. A more detailed feasibility study is recommended to validate the potential of each site.

4. **Focus the initial expansion on Tanjung Perak and Lembar**

As a first phase, it is recommended that the IPCC prioritises Tanjung Perak and Lembar ports. Tanjung Perak is strategically important for completing the network of four key domestic nodes, while Lembar offers a strong entry point to support business development in Eastern Indonesia. These two locations provide the best starting point for phased expansion with measurable impact.

Conclusion

The findings of this study reinforce the significant role that IPCC can play in supporting the growth of Indonesia's automotive logistics sector. By aligning terminal expansion plans with economic indicators and cargo throughput trends, IPCC is well-positioned to enhance its national presence, reduce port congestion, and offer value-added services that encourage further investment in domestic vehicle production. A strategic, data-driven expansion, starting with high-potential ports such as Tanjung Perak and Lembar will enable the IPCC to strengthen its competitive position while contributing to the country's domestic supply chain efficiency and regional economic development.

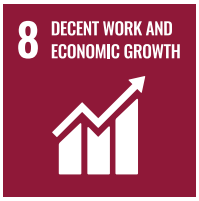
Impact and Implementation

Following the Pelindo merger, the IPCC has adopted an organic growth strategy by expanding its operations into high-potential terminals across the broader Pelindo network. This research supports the long-term terminal expansion strategy of IPCC, aligned with the company's corporate master plan. As such, the findings of this dissertation serve as a key resource for identifying and prioritising new operational areas.

By October 2024, the IPCC had successfully added the Trisakti Terminal in Banjarmasin, South Kalimantan, to its operational portfolio. Looking ahead to 2025–2026, the IPCC plans to evaluate and possibly expand into Tanjung Perak Port (Surabaya) and Lembar Port (Lombok). The three terminals—Trisakti, Tanjung Perak, and Lembar—are among the seven priority ports identified in this study for future expansion.

The IPCC has already seen tangible benefits from the expansion of terminal operations. In 2024, operational and financial performance improved significantly, driven by a stronger national port network and the introduction of value-added offerings such as commercial bundling services and operational transformation initiatives. Such improvements not only enhance the competitiveness of IPCC, but also promote value creation within the Pelindo Group, ensuring strategic benefits of coordinated logistics integration at a national level.

Sustainable Development Goals



The terminal expansion strategy of IPCC aligns with the Goal 8 as it aims to promote sustained, inclusive economic growth, productive employment, and decent work for all. By expanding its operational footprint across key terminals on Indonesia's four main islands, the IPCC is fostering regional connectivity, making gains both in and outside of Pelindo ports.

In a broader context, the operations of IPCC at these major ports would significantly contribute to Indonesia's pursuit of sustainable economic development. Through improved logistics infrastructure and increased accessibility, the IPCC supports economic inclusivity and growth, reinforcing the country's commitment to sustainable and resilient development.

(F) Reducing Emissions by Developing a Net-Zero Emissions Roadmap for the Indonesia Port Corporation Car Terminal

Ms. Gisha Rizky Prathita (author), Business Development Manager, Indonesia Port Corporation Car Terminal

Mr. Rio T. N. Lasse (mentor), Director of Operations and Transformation of PT ASDP Indonesia Ferry (Persero)

Author biography

Ms. Prathita began her career at Pelindo in 2010 in the Engineering and Design Department, drawing on her background in civil engineering. In 2015, she joined the Corporate Strategic Planning team, where she was actively involved in the planning and development of Pelindo's national strategic business alliance projects. Since 2021, she has served as Business Development Manager at IPCC Car Terminal, a subsidiary of Pelindo.

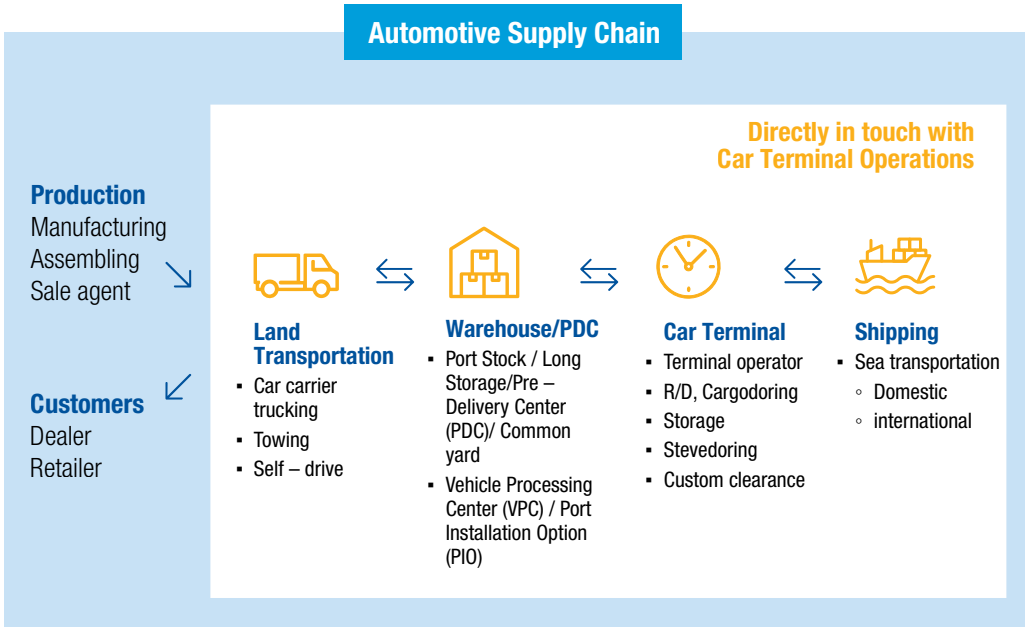
Introduction

Climate change has become a central focus of global attention. One of its primary causes is the rise in global greenhouse gas (GHG) emissions, driven by several sectors, including transportation. Among these, road transport accounts for approximately 75% of GHG emissions, while the maritime sector contributes around 11%. In response, climate change has also become a priority in Indonesia's development agenda. To address the challenge, the Indonesian government has launched sustainable development strategies aimed at peaking national GHG emissions by 2030 and reaching net-zero emissions by 2060 or earlier. In this context, IPCC Car Terminal, a subsidiary of PT Pelabuhan Indonesia (Pelindo), plays an important role in advancing the transport sector's contribution toward the national net-zero emissions target.

To help achieve the national goal, the implementation of the Green Port concept at the IPCC Car Terminal is essential. However, this ambition highlights two key challenges. First, the IPCC currently lacks strategic initiatives that aim to achieve net-zero emissions. Second, there is no existing green roadmap to serve as a structured and measurable guide for implementation. The absence of both a strategy and a roadmap may not only have negative environmental consequences, but could also pose as a business risks. Without clear sustainability initiatives, the IPCC could miss valuable business opportunities by failing to meet stakeholder expectations, particularly those in the automotive supply chain industry who have already adopted net-zero or carbon neutral targets.

> Clear guidelines are a necessary element of commitment to net-zero targets

Figure III.13
Automotive Supply Chain



Source: Internal studies of the Indonesia Port Corporation Car Terminal.

Analysis

The IPCC is a Roll-on/Roll-off facility that handles only Roll-on/Roll-off vessels and cargo such as cars, trucks, trailers, and other wheeled heavy equipment. Although car terminals typically do not require cranes or conveyor systems, certain sites for supporting operations such as vehicle inspection and electric charging can contribute to GHG emission reduction. Each movement of cargo has the potential to generate emissions and/or waste. As such, it is important for the IPCC to develop a green car terminal concept.

Currently, the IPCC is certified under SNI ISO 14001:2015 for Environmental Management Systems. This certification positions the IPCC one step closer to becoming a green port, as it demonstrates compliance with baseline environmental standards. However, to fully develop a green terminal, the IPCC must conduct a gap analysis to identify discrepancies between its current practices and the conditions required to achieve its sustainability goals. Hence, this analysis focuses on the core business activities of IPCC and how they can be aligned with green port principles. Key objectives to achieve sustainable operations are energy and water conservation, recycling and waste reduction, and minimising the terminal's impact on surrounding communities. For the purpose of this dissertation, Tanjung Priok Car Terminal has been selected as the case study location.

In order to implement the Green Port concept in Indonesia, the IPCC must address several key challenges:

1. Lack of specific environmental guidelines: Currently, there are no national regulations or defined environmental guidelines specifically tailored to green car terminals. As a result, the IPCC must rely on international standards and best practices when developing its roadmap, while also incorporating directives that reflect local operational and environmental conditions.
2. Limited awareness and scalability: In Indonesia, local and small businesses in

the automotive sector often have limited awareness of net-zero emission goals. In addition, green technologies are often perceived to be economically unfeasible due to the lack of economies of scale.

3. High cost and technical barriers: For developing countries like Indonesia, adopting new green technologies can be challenging. Introducing green technologies often requires a significant amount of investment and specialized knowledge for maintenance and operation. Therefore, any improvement strategy should be scaled to the level of development and financial capacity of the port.

Given the main elements of a green port, the challenges involved, and the current state of the IPCC, the following strategic initiatives are proposed to achieve net-zero emission goals:

- Strategic initiatives in terminal operations
- Strategic initiatives in infrastructure development
- Strategic initiatives focused on people and community engagement
- Strategic initiatives involving regulations and third-party collaboration

Each strategic initiative follows three phased stages for gradual implementation, drawing a roadmap to ensure effective implementation:

1. **Phase 1 (2024–2026): Planning and initial transformation**

The objective of the first phase is to establish the foundation for the transition towards net-zero emissions by conducting in-depth studies, preparing detailed plans, and ensuring that the operations meet basic requirements.

2. **Phase 2 (2027–2028): Implementation and collaboration**

This phase involves implementing the plans developed in Phase 1 while building partnerships with key stakeholders in the automotive supply chain.

3. **Phase 3 (2029–2030): Full implementation of the green car terminal**

The main focus is to fully transition Tanjung Priok Car Terminal into a green car terminal while enhancing the measures introduced to achieve net-zero emissions.

Recommendations

Based on the study findings, the following recommendations are proposed to support future initiatives and improvements at the IPCC:

1. **Conduct cost–benefit analyses:** The roadmap should include detailed cost-benefit studies to support every milestone outlined. It is essential to evaluate the feasibility of investing in renewable energy and green technologies as they require substantial capital.
2. **Monitor operational progress:** The IPCC should continuously assess its operational performance to maximise the benefits of green terminal implementation. It is crucial for the department of management to stay up-to-date must stay informed on green technology advancements and integrate relevant innovations.
3. **Align collaborations with strategic plans:** The IPCC should partner with stakeholders in the automotive supply chain should be grounded in comprehensive studies and business plans that align with the roadmap and long-term vision of IPCC.
4. **Update roadmap with national frameworks:** The green car terminal roadmap of IPCC should be regularly reviewed and adjusted to align with Pelindo's broader green port strategy.

Figure III.14
Net-zero emissions Roadmap of the Indonesia Port Corporation Car Terminal

2024–2026
Planning and intial transformation stage

- Certification, facilities, and operation
- advancement, shifting towards cleaner renewable energy (25%),
- Cost and benefit analysis of green car terminal concept implementation,
- Formulating green car terminal regulations and policies and initial implementation,
- Formulation of net-zero emission ASC guideline in Indonesia,
- Digital transformation and improvements,
- Alternate energy implementation initial stages and installation of new charging plants,
- Increasing car carriers and vessels utilization rates,
- Culture transformation towards green and sustainable culture.

2027–2028
Implementation and collaboration stage

- Operation transformation, shifting towards cleaner renewable energy (50%),
- Green policy and regulation implementation in IPCC Tanjung Priok and IPCC Operation Area (50%),
- Construction and installation of additional new charging plants and energy storage,
- Integrated systems with all key stakeholders, customers, and partners,
- Minimum requirements fulfilment in other IPCC operation area;
- Formulation of net-zero emission ASC guideline in Indonesia.
- Initial implementation of cargo distribution integrated planning within a company or between companies in ASC.

2029–2030
Green car terminal Concept Full Implementation

- Operation transformation: 100% shifting towards cleaner renewable energy in Tanjung Priok Car Terminal.
- Green policy and regulation implementation in all IPCC operation areas(100%),
- Implementation of green ASC guideline in Indonesia,
- Full Implementation of cargo distribution integrated planning within a company or between companies in ASC.
- Continuously collaborate with other parties in ASC to advance the IPCC green car terminal transformation.

Source: Author

My dissertation is now used as the base for the detailed study of the Net-Zero Emissions Roadmap for the IPCC (in progress). I am also involved in conducting the Long-Term Corporate Plan for IPCC, which includes many things learned during the Programme, such as best practices and current trends that we have to anticipate in the future.

Conclusion

As a car terminal operator, the IPCC is responsible for contributing to Indonesia's net-zero targets. Based on key green port principles, implementation challenges, and the current state of the IPCC Car Terminal, the study draws a phased roadmap towards 2030. Each of the three phases targets specific areas of green port development, with an overarching focus on operational efficiency, emissions reduction, energy conservation, and collaboration across the automotive supply chain.

The IPCC alone does not determine the success of implementing a green

car terminal. It also depends heavily on the broader context of the port in which it operates. As part of the larger port ecosystem, the IPCC is subject to overarching port policies, which can significantly influence or limit its initiatives. Therefore, strong collaboration with other stakeholders in the automotive supply chain is essential to achieve both environmental and commercial goals.

The IPCC can play a central role as a consolidator, fostering communication and building bridges between supply chain partners. Integrated planning and cooperation across all players in the supply chain are vital to achieving the shared objective that is reducing GHG emissions and advancing green supply chain management.

Sustainable Development Goals

The implementation of green initiatives at the IPCC and the green port concept in Pelindo ports and terminals, focusing on environmentally friendly and sustainable development concepts, serve to contribute to Goal 13, climate action, Goal 14, life below water, and Goal 17, partnerships for the goals.

By introducing renewable energy and green technologies through detailed analysis, monitoring and collaboration, ports will be able to reduce emissions, promoting environmentally friendly operations.

Aligning port operations with the green port principles will help minimize the impact on marine resources

Fostering open communication with stakeholders will strengthen relationships and enhance the effectiveness of collaboration to achieve green port management.

(G) Standardisation Crew Position and Competencies on Pilot and Tugboats at Pelindo Marine Services

Ms. Fitri Nurani Pulubuhu (author), Vice President Human Resources, PT Pelindo Jasa Maritim

Mr. Mundzyr Salim (mentor), Senior Vice President Human Resources Planning and Management PT Pelindo Jasa Maritim

Author biography

Ms. Pulubuhu began her career at PT Pelindo in 2008, joining the Human Resources and General Affairs Directorate. With a background in psychology, she was recognised for her potential. In 2015, she was awarded a company-sponsored scholarship in 2015 to pursue a master's degree in human resource management, further enhancing her expertise in talent management and succession planning.

Since 2021, Ms. Pulubuhu has served as Vice President of Human Resources Planning and Organisation at PT Pelindo Jasa Maritim Subholding, where she oversees workforce planning, organisational design, and Human Resources policy implementation, ensuring that they aligned with business goals. With her expertise in human resources, she has been committed throughout her career to fostering leadership development and optimising organisational structure to support sustainable growth in Indonesia's maritime sector.

> *Since completing the Programme, I received an opportunity to join Accelerated Leadership Program for Pelindo. The knowledge and skills acquired from the Programme have been instrumental in my professional growth, implementing best practices in my work and contributing effectively to my organisation.*

Introduction

Indonesia, as an archipelagic nation, relies heavily on maritime transport to support its economic activities. With an area of 1.9 million square kilometres, it ranks fourth among the largest island nations in the world. PT Pelabuhan Indonesia (PT Pelindo), a state-owned enterprise, plays a crucial role in managing tugboat operations. Following its merger in October 2021, PT Pelindo established 4 sub-holdings, including PT Pelindo Jasa Maritim (PT PJM) which oversees two subsidiaries: PT

Jasa Armada Indonesia and PT Pelindo Marine Service (PT PMS). In 2022, PT PJM centralised the management of towage operations from regional divisions to PT PMS. This operational transfer was driven by several factors, including towage as the core service of PT PJM, the need for a port business entity permits held by PT PJM, strategies for market development and operational synergy, potential for pilotage and towage management in various port areas and financial growth focus on Pelindo.

One of the challenges faced in this business is human resources. Human resources are critical in pilot and tug business, with 1,627 crew members, of which 1,011 are managed by PT PMS. Crew competency directly impacts operational success. Following the operation transfer, PT PJM has conducted assessments to standardise operations and ensure crew safety. To address these challenges, standardisation of organisation structure, job titles and competency requirements for crew members is essential. Standardisation and development of competent human resources are vital for enhancing service quality in Indonesia's maritime sector. As the industry becomes increasingly competitive, reliable and skilled personnel will be key to delivering excellent customer service and improving the overall competitiveness of maritime operations in Indonesia.

Analysis

The issue with crew standardisation at PT PMS emerged following the business transfer in 2022, which centralised the management of towage operations. This transition highlighted significant discrepancies in crew qualifications and organisational structures, leading to challenges in the effective crew management. The lack of a standardised approach to crew positions and competencies has created operational inefficiencies, impacting the overall effectiveness of PT PMS in delivering towage services.

Upon evaluation, it was found that 44 crew members did not meet the qualifications required for their roles. This shortfall poses a significant challenge for PT PMS, as the company also faces a shortage of crew members, making it difficult to ensure optimal operations in the towage business. The inability to meet these staffing requirements not only affects service delivery but also raises concerns regarding compliance with industry regulations and safety standards.

To address these challenges, PT PMS must prioritise the standardisation of crew positions and competencies required for each role. Establishing clear guidelines and requirements for crew will help improve the management of human resources and ensure that all personnel are adequately trained and certified. This standardisation process is essential for enhancing operational efficiency and maintaining high-quality service in a competitive sector of the maritime industry.

The proposed solutions include implementing comprehensive training programmes focused on nautical and engineering skills, as well as establishing partnerships with educational institutions to provide high-quality education for crew members. Additionally, PT PMS should introduce competency development initiatives such as workshops and certification programmes to enhance the skills and knowledge of its workforce. These measures will not only improve crew qualifications but also foster a culture of continuous learning and professional development within the organisation.

Finally, strong management support is crucial for the successful implementation of these solutions. Management must commit to allocating the necessary resources, both financial and logistical, to facilitate crew training and standardisation efforts. By prioritizing education and skill development, PT PMS can ensure that its crew members are well-equipped to meet the demands of the industry, ultimately leading to improved service delivery,

enhanced safety, and compliance with regulatory standards. This commitment to crew development aligns with broader goals of sustainable development and quality education, reinforcing PT PMS's position as a leader in the maritime sector.

Recommendations

This research identifies critical operational challenges faced by PT PMS in managing its towage division, particularly in the aftermath of the 2022 business transfer. A key issue is the misalignment between crew qualifications and regulatory requirements: currently, 44 crew members lack the certifications mandated by national and international maritime regulations, severely impacting crew management and limiting flexibility in crew deployment.

The key to ensuring quality, safety, and reliability of service lies in training and development in human resources management

Moreover, a shortage of qualified personnel—based on optimal staffing levels—requires immediate attention. Management support is essential to ensure compliance with the Manila Standards of Training, Certification and Watchkeeping Amendments and PM 93 of 2014, as ongoing deficiencies in certification and staffing could jeopardize the validity of tug operation permits.

To address these issues, PT PMS should prioritize the following actions:

- Accelerate crew certification and training programmes to meet regulatory standards.
- Implement a structured watchkeeping system to ensure safe and efficient vessel operations.
- Formalise seafarer employment agreements to support flexible and compliant crew transfer arrangements.

These steps are critical for strengthening operational continuity, safeguarding regulatory compliance, and maintaining the company's towage service reliability.

Conclusion

To address the issues, the study emphasises the need for the standardisation of positions and competencies among PT PMS's pilot and tugboat crews. This standardisation is crucial for resolving transfer scheme problems and preparing the organisation for future business development. The research advocates for a collaborative approach between the company and its workers to enhance education, certification, and training. By promoting educational initiatives as the top priority, PT PMS aims to improve crew competencies, ensure reliable and safe towage services, and ultimately, achieve sustainable development in the maritime sector. Management support and commitment are vital for implementing these standardisation programmes and securing the necessary budgets for compliance with operational regulations.

> *The PMP has had a profound impact on both my professional development and the marine service standardisation. The comprehensive knowledge I gained has allowed me to implement more efficient practices and foster a culture of continuous improvement within my team. The port-related insight has not only enhanced my decision-making skills but also contributed to driving the effectiveness of the human resources function as an enabler in supporting port operational processes and development.*

Impact and Implementation

PT PMS has taken significant steps to enhance crew qualifications and optimise staffing at the port, including a collaboration with a local maritime polytechnic institute to facilitate certificate upgrading for the 44 underqualified crew members missing certifications. Additionally, the company has implemented the standardisation of crew positions to ensure adequate coverage of different types of crew across various units. To address staff shortages, the company plans to recruit replacement crew members through a maritime employment agreement, which will allow them to hire qualified personnel who are able to contribute immediately and can be reassigned based on the company's operational requirements. The first phase of this programme was successfully executed in November 2024, and the second phase is scheduled for September 2025.

PT PMS is also undergoing organisational restructuring, which includes the standardisation of job positions within the marine cluster. This initiative is set to be completed by 2025 and aims to align the organisational structure with industry best practices. The implementation of these recommendations is expected to significantly enhance operational efficiency, improve service delivery, and ensure compliance with regulatory standards - ultimately benefiting the institution and the broader maritime sector. By investing in crew qualifications and optimising its organizational structures, PT PMS is positioning itself for sustainable growth and improved competitiveness in the maritime industry.

Sustainable Development Goals

This research highlights the importance of Goal 4, quality education, as a critical component of achieving sustainable development. PT Pelindo demonstrates its commitment to improving workforce capacity through management programmes that align with Key Performance Indicators.

The company aims to enhance the education of ship crews by implementing nautical and engineering programmes and collaborating with universities and shipping colleges to ensure high-quality training. Additionally, PT PMS has established competency development initiatives, such as crew transformation workshops, to equip crew members with the necessary skills to adapt to changes in towage operations. With quality education and appropriate certification, the company ensures regulatory compliance, which is crucial for maintaining operational standards. This commitment not only enhances crew competencies but also enables the company to improve service delivery, ship reliability and safety, thereby fostering trust and satisfaction in the maritime industry.

Mombasa Port Container Terminal

Kenya Ports Authority

The Kenya Ports Authority (KPA) is a State Corporation under the Ministry of Roads and Transport. It was established in 1978 under the Kenya Ports Authority Act (Cap. 391). As the principal maritime agency in Kenya, KPA oversees the management and operation of all seaports and inland waterways, playing a pivotal role in regional trade by serving Kenya and neighbouring landlocked countries, including Burundi, Democratic Republic of Congo Rwanda, South Sudan, and Uganda, ensuring seamless trade connectivity.

The mandate and core functions of KPA encompass port development, maintenance, cargo handling and marine services including the provision of aids to navigation and pilotage. The Authority also provides ferry services and inland waterway management. Guided by the principles of integrity, innovation, care, and customer focus, KPA remains committed to operational excellence and trade facilitation, reinforcing its position as a leading port authority in the Africa region.

The Port of Mombasa is the largest and busiest seaport in East Africa, serving as a critical gateway for international trade. Strategically located along the Indian Ocean, it handles imports, exports, and transshipment cargo, driving Kenya's economy and regional integration.
The port of Mombasa is a Multi Cargo Terminal (Container and Conventional Cargo) with 17 berths which have a total quay length of 4,184 meters and drafts ranging from 10-15 meters. There are 2 bulk oil jetties namely, Shimanzi Oil Terminal and the Kipevu Oil Terminal.

Besides the Port of Mombasa, there is also the Port of Lamu, one of the flagship projects under the Lamu Port-South Sudan-Ethiopia Transport Corridor. The Port of Lamu has three container berths with a total straight quay length of 1,200 metres and -17.5 meters depth making it able to handle larger ships.

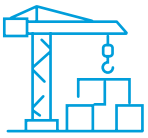
On the western part of Kenya lies Kisumu Port, which is a vital inland port on Lake Victoria, facilitating trade within the East African Community and the lake region. The Inland Container Depots located in Nairobi and Naivasha are critical in extending port services to the hinterland for efficient cargo clearance and logistics. KPA recently completed the construction of Shimoni Fish Port, the country's first dedicated port supporting Kenya's Blue Economy sector through fish processing and value addition.

To enhance efficiency, capacity, and regional competitiveness, KPA has implemented strategic projects, focussed on infrastructure development and modernisation. Key among these initiatives include the Mombasa Port Development Program encompassing the expansion of the Second Container Terminal (Phases 1 and 2 completed, Phase 3 underway) to boost cargo handling capacity. Other initiatives include the Mombasa Special Economic Zone at Dongo Kundu with a dedicated berth to support manufacturing and export growth.

Further afield, KPA has embarked on automation and equipment modernisation to enhance operational efficiency by leveraging technology as well as environmental sustainability initiatives to promote eco-friendly port operations.

The Authority, through its Corporate Social Investment policy, invests in projects aimed at uplifting living standards of communities focusing on health, education, water and sanitation, sports, arts and culture, women and youth empowerment, humanitarian aid, and environmental conservation programmes focusing on sustainable practices and green initiatives.

Tonnes of trade
42 595 000



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KPA has embarked on a transformative journey by joining the UNCTAD TrainForTrade PMP, a strategic move aimed at enhancing operational efficiency, capacity building, and long-term sustainability. This initiative aligns with a broader vision of KPA of becoming a global port of choice, emphasising on human resource development as a key enabler of its strategic objectives. The PMP presents an opportunity to strengthen the workforce of KPA through structured training, international benchmarking, and local partnerships, fostering a culture of continuous learning and innovation.

A critical aspect of the success of PMP in KPA lies in fostering local ownership. To ensure sustainability, KPA plans to develop a pool of certified local instructors, primarily senior managers, who will facilitate training for middle managers and other stakeholders. By participating in annual Training of Trainers (ToT) workshops, KPA will cultivate a self-reliant training ecosystem, reducing dependency on external experts. This approach not only enhances institutional knowledge but also ensures that the programme remains embedded within KPA's long-term training strategies.

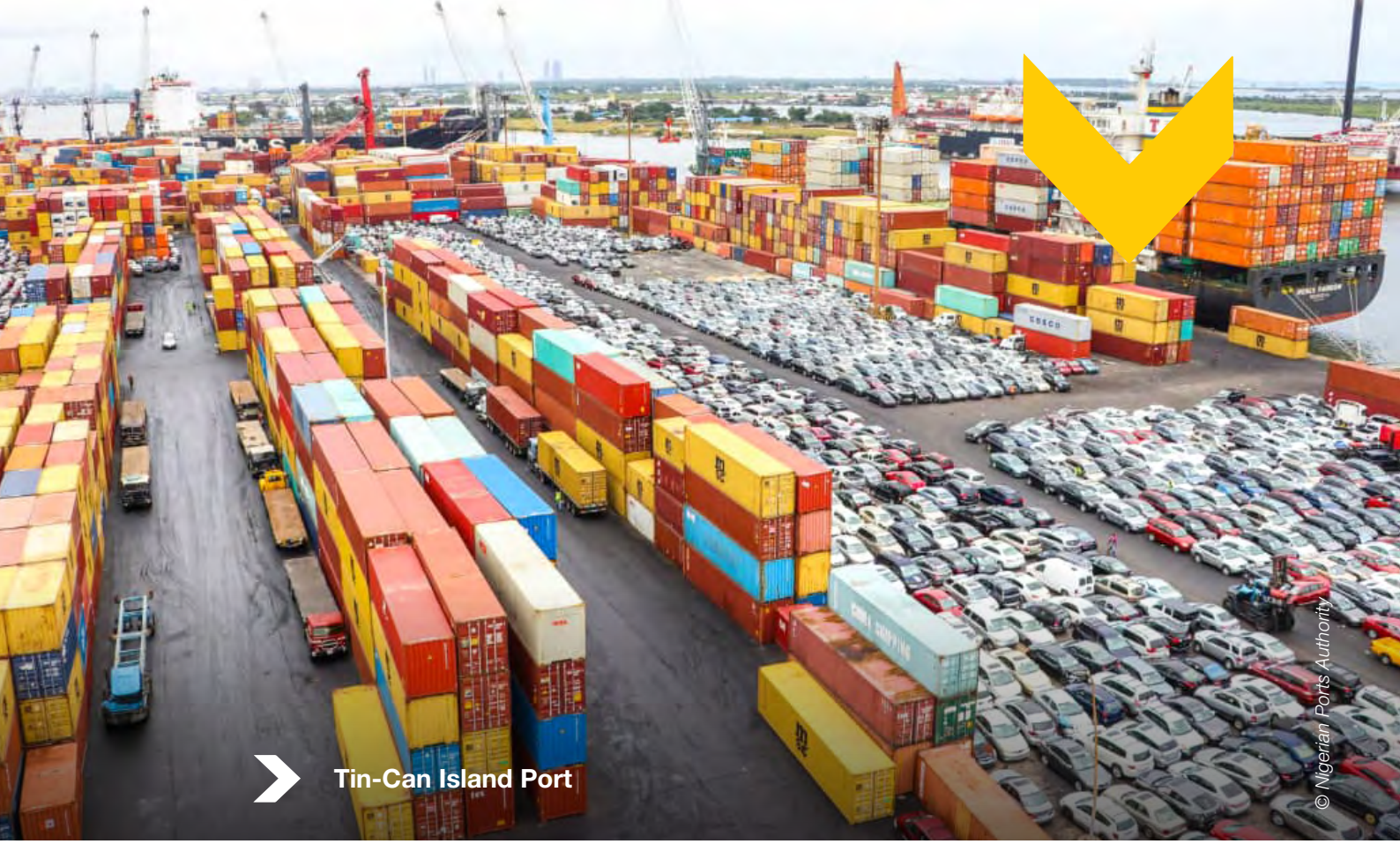
Beyond internal capacity building, KPA intends to extend the benefits of PMP to the wider port community. Collaborating with public and private sector stakeholders such as logistics firms, customs agencies, and shipping companies to create a more cohesive and skilled maritime industry in Kenya. Such partnerships will expand the pool of trained professionals, improving overall port efficiency and competitiveness. By integrating external stakeholders into the programme, KPA reinforces its role as a leader in Kenya's maritime sector while fostering a culture of shared knowledge and best practices.

KPA recognises the value of learning from regional counterparts that have successfully implemented the PMP. Benchmarking against ports like Mombasa's regional peers will provide insights into effective programme execution. Additionally, the TrainForTrade network offers KPA access to international expertise, allowing its officials to engage in knowledge exchange through workshops, coaching sessions, and dissertation presentations. This global perspective is crucial in addressing modern port challenges, including technological advancements, climate resilience, and supply chain disruptions caused by geopolitical tensions.

The maritime sector is rapidly evolving, calling for adaptive and forward-thinking management strategies. The curriculum of PMP covering port operations, environmental sustainability, and financial management equips the workforce of KPA with the skills needed to navigate these complexities. By prioritising continuous learning, KPA ensures its workforce remains competitive in an industry increasingly shaped by digital transformation and sustainability demands.

The implementation of the TrainForTrade PMP represents a strategic investment in the human capital of KPA, positioning the Authority for long-term success. By fostering local ownership, expanding stakeholder collaboration, leveraging global networks, and addressing industry challenges; KPA is laying a robust foundation for operational excellence. This initiative will not only enhance the efficiency of KPA but also strengthen Kenya's maritime sector, reinforcing its role in global trade. Ultimately, the PMP is more than a training programme, it is a catalyst for innovation and sustainable growth in Kenya's port industry.

Capt. William K. Ruto, CEO, Kenya Ports Authority



Tin-Can Island Port

Nigerian Ports Authority

Nigerian Ports Authority (NPA) is a federal government agency that governs and operates the ports of Nigeria. The major ports controlled by NPA include Lagos Ports Complex and Tin-Can Island Port in Lagos, Lekki Deep-sea port in Lagos area, Calabar Port, Delta Port, Rivers Port at Port Harcourt, and Onne Port in Eastern area.

The NPA commenced operations in April 1955 following the implementation of the Ports Act of 1954. In line with the existing enabling Law (Port Acts of 1999 as amended), the statutory duties and functions of NPA are the following:

- Develop, own and operate ports and harbours.
- Provide safe and navigable channel
- Offer cargo handling and storage services.
- Maintain Port facilities and equipment
- Ensure safety and security
- Develop and own property.

The vision of NPA is to be the Maritime Logistics Hub for Sustainable Port Services in Africa with a Mission to deliver efficient port service in a safe, secure and customer-friendly environment. Our Core Values include Efficiency, Customer Satisfaction, Innovation, Collaboration, Integrity Safety and Security.

To reposition the Port towards expanding the frontiers of trade and the national economy, Nigerian port system has undergone evolution with successful implementation of port reforms that altered the governance model from Operating Port to Landlord Port Management system. This comes with the injection of private sector initiatives and funding to port operations with the associated effects on improved productivity and efficiency.

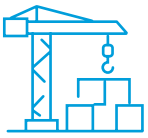
The present Board and Management of NPA are poised to mainstream Nigerian Ports into the global port system. Consequently,

there is a tectonic shift towards the development of Deep-Sea ports. Presently, Lekki Deep Sea port has commenced commercial operations. The Port has a depth of 16.5m, which is arguably the deepest in the West Africa sub-region, with state of the art most modern cargo handling equipment. In addition to this, Badagry Deep-sea Port is set to commence construction soon. Equally, the existing ports are about to undergo modernisation as the financial closure has been reached with the bank financing the project.

Towards building a resilient and sustainable port, NPA is embracing immense benefits inherent in blue-economy and environmentally friendly initiatives via the Energy Transition, Ballast Water Management, strong regime of pollution control in the port and Reception Facilities in all our port locations.

The combined effect of these efforts is to position Nigerian Ports on the path of competitiveness and as the hub for the region. This is in line with our Vision of being the Maritime Logistics Hub for Sustainable Port Services in Africa. Nigerian Ports are a work in progress and we are committed to getting there.

Tonnes of trade
103 336 863



TEUs
1 738 379

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My special appreciation to UNCTAD for the initiative of the TrainForTrade Port Management Programme aimed at human capacity development in developing countries. Since the launch of the programme in West Africa in 2013, Nigeria has actively participated with the support of the Ports of Belfast, Cork, Dublin and the Irish Government. With the completion of Cycle 3, over 60 port managers have been trained in Nigeria. It is important to note that some of the graduates of the past three cycles are now holding strategic positions in Nigerian Ports Authority.

Towards deepening the noble efforts of UNCTAD, Nigerian Ports Authority's Management have been intentional about this programme by ensuring we have a dedicated budget in each fiscal year for seamless running of this programme. In addition, we support the idea that the training programme for each module should be held in each of our port locations to expose the participants to practical knowledge of the functioning of our port system. Through this endeavour, the participants have helped in identifying the challenges of our port system and have come up with an implementable strategic framework to solve the identified problems.

The impact of the Port Management Programme has helped the Authority to develop a body of experts that we are exporting to serve as consultants to Government, Terminal Operators and Private port developers. This body of experts are helping in our sustainable endeavours of knowledge transfer to young officers and function as Mentors and Coaches.

With the gale of retirement that is facing the Nigerian Port system in the recent time, our partnership with UNCTAD has helped in providing necessary success for system stability.

It is against this backdrop that the Management of NPA is committed to continual partnership and that our commitment to the UNCTAD TrainForTrade Port Management Programme is not negotiable. To our development partners, we look forward to your further collaboration and sponsorship opportunities in the areas of trainings and human capacity building, especially now that the Nigerian Ports Authority is experiencing shortage of skilled personnel due to its aging workforce.

God Bless UNCTAD
God Bless Nigerian Ports Authority.

Dr. Abubakar Dantsoho, Managing Director, NPA

(H) Port Performance Study on the Effects of Traffic Gridlock along the Seaport Corridors: a case study of Tin Can Island Port, Apapa, Lagos

Mr. Ikechukwu Joel Ogunna (author), Senior Manager, Security/Port Facility Security Officer, Nigerian Ports Authority

Mr. Joseph Adewunmi Adegbite (mentor), Assistant General Manager, Corporate & Strategic Planning, Nigerian Ports Authority

Author biography

Ikechukwu Joel Ogunna is currently a senior management official at NPA. He holds a bachelor's degree in economics from the Abia State University, Nigeria and a master's degree in psychology from the University of South Wales, United Kingdom. He also, holds professional certifications as follows: Fellow of the Certified Institute of Logistics and Transport; Certified Member, Institute of Cost Management, Nigeria; and Certified IMO Port Facility Security Officer.

Mr. Ogunna has held several leadership positions at the Security Division of the NPA across different ports in Lagos, Nigeria, such as budgeting officer, procurement officer, and intelligence and logistics officer. He was recently posted to the Federal Lighter Terminal Onne, Rivers State, Nigeria as the Port Security Officer.

Since completing the program, the knowledge gained has been instrumental in my current job role which entails procurement, budgeting, management and coordination of security operations, and collaborations with professionals from other Divisions in the organization as well as other sister security agencies such as the Nigerian Navy, Nigerian Police Force, Directorate of State Security, etc.

Introduction

The overarching objective of this study was to assess the impacts of road traffic gridlock on the performance of Nigerian ports, using Tin Can Island Port as a case study. The assessment prompted the researcher to advise NPA management on implementing a more efficient port system, one that minimizes congestion and eliminates operational obstacles. Further to that, the study ventured into identifying innovative and sustainable solutions for the eradication of the gridlock problem from port corridors in Nigeria.

The problem of traffic gridlock on seaport corridors in Nigeria began soon after the port concession programme of 2006. During this programme, the NPA ceded its cargo operations responsibility to private terminal operators, with the aim of making the Nigeria Port System more efficient and economically viable. Prior to the concession era, the NPA was solely in charge of cargo operations and therefore provided spaces where haulage trucks usually stayed in the port pending the loading and/or unloading of their cargoes. However, in their quest to maximise profit through space optimisation, the private terminal operators converted the spaces that were previously used by waiting trucks into stacking areas for cargo. This caused the haulage trucks to resort to parking on the port corridors while awaiting to be called into port, thereby creating gridlock and congestion problems on the road.

Several efforts by the NPA to mitigate the problem failed until March 2024, when, through interagency collaboration, armed security agencies were deployed to the corridor to enforce a "no stopping" and "no waiting" order for trucks. This initiative brought some level of success by freeing up space for hauliers, as only trucks with confirmed port entry orders were permitted port access. However, this solution proved unsustainable due to the high cost of maintaining 24-hour armed security personnel. By June of 2024 the problem had fully resurged. This study assesses and compares the port performance indicators of the pre-concession era and the post-concession era to determine whether gridlock has impacted port performance.

Analysis

Data for the study were collected from both primary and secondary sources. The analysis employed descriptive statistical techniques using simple frequency tables and percentages. The primary data comprised personal interviews with four key operations officers of the Tin Can Island Port such as, the Port Manager, Port Security Officer, Assistant General Manager, Operations, and General Manager, Security. The secondary data was received from the Corporate and Strategic Planning Division of NPA which included four performance indicators of Tin Can Island Port such as: the number of vessels visit to the port, cargo throughput volume, turnaround time of vessels and berth occupancy rates. Six-year periods were studied for both the pre and post concession eras. A qualitative exploratory case study approach was adopted for the research.

Interview with Port Security Officer, Tin Can Island Port

Source: Author

A comparative analysis of the two eras was then carried out to ascertain if the port's performance in the post-concession era varied with the prevalence of the gridlock problem. The idea was to compare how the port performed in the pre-concession era when there was no gridlock vis-à-vis the post era, when the gridlock problem prevailed. Any disparity between the indicators in the two eras was interpreted as an impact due to the gridlock, all other factors being equal. Furthermore, to enhance the validity of the findings of the research, the interview responses obtained during the primary data gathering stage were used for data triangulation of the overall results. The study also acknowledged the fact that there are other factors that may have affected the port's performance in the post concession era that were not within the scope of the study. These factors include: the impact of COVID-19 pandemic which occurred during the post-concession era, quality of cargo handling equipment, productivity of port workforce, quality of port infrastructure, amongst others.

The overall results showed that only the cargo throughput and the berth occupancy ratio of the port experienced a downturn in the post-concession era. This became evident from the statistics of the two indicators (cargo throughput and berth occupancy ratio) which varied significantly between the two eras. The study concluded that the cargo throughput and berth occupancy ratios of the port were adversely affected by the gridlock problem. The responses of the interviewed port officers (General Manager, Security, Port Manager, Port Security Officer, and the Assistant General Manager, Operations) also gave credence to these findings. Given the fact that ports function as business enterprises, this is an understandable consideration, as there is a reliance on a continuous flow of activity and seamless coordination between the hinterland and port-side activities to ensure operational efficiency.

Recommendations

Following the results from both the primary and secondary data analyses, the study concluded that traffic gridlock on the port corridor had a direct effect on port performance. The findings of the secondary data helped to reveal the indicators that were mostly affected; those being: cargo throughput and berth occupancy rates of the port. Therefore, since port operations depend on the fluidity of activities between the maritime space, the port operations space and the hinterland space, the study emphasised the imperativeness of adopting a holistic approach to addressing the gridlock problem.

The recommended approach to be adopted includes:

(i) A review of the port concession agreements, some of which are due to expire in the coming two years. The review process is expected to address issues of operational exigencies that were not envisaged when the initial agreements were made and which have now constituted operational encumbrances, such as traffic gridlock.

(ii) A need for the establishment of an efficient electronic call-up system which would ensure that only haulage trucks with a call-up are allowed to enter the port corridor.

(iii) Stronger collaboration between port stakeholders through digital port community platforms to enable collaborating agencies to have access to operational information and to be able to take responsibility and take appropriate actions on a real-time basis.

(iv) Regular and timely rehabilitation of the port access roads.

Leveraging port performance indicators is essential to driving operational efficiency and enhancing overall port effectiveness

Conclusion

In summary, the study found that congestion along the port corridor had a significant impact on the overall performance of the port. The research revealed, through the analysis and comparison of the pre and post-concession eras, that traffic gridlock on the port corridor had a direct effect on port performance. These findings not only indicate a direct causality between new practices in the port thanks to the new concession agreements, but also show that a review and modification of these soon-to-expire contracts is necessary for the smooth running of NPA operations.

Impact and implementation

NPA management is currently reviewing the recommendations of the study and the outlined implementation strategies with a view to adopting some of them, especially recommendations 1, 2, and 3, which require reviewing the concession agreements and the emplacement of an efficient truck call-up system. As many concession agreements with terminal operators are due to expire in the near future, now is the best time to capture and act on contractual issues that are leading to operational deficiencies.

NPA management is also in the process of establishing a Port Community System to serve as a robust collaborative platform with stakeholders such as the Lagos State Government, Port Authority Police, Nigerian Customs Service, the Nigerian Maritime Administration and Safety Agency, Nigerian Shippers Council, Port Consultative Council, Terminal Operators, Freight Forwarders, Clearing Agents, and Haulage Companies. This enhanced model of collaboration will also assist with the resolution of the gridlock problem as well as other port related operational issues.

Sustainable Development Goals

Port gridlock leads to excessive fuel consumption and emissions from stationary haulage trucks, highlighting the urgent need for more energy-efficient and sustainable logistics practices. The case study contributes immensely the Federal Government of Nigeria's goals alongside the UN SDGs; specifically Goal 3, Good Health and Well-Being, Goal 7, Affordable and Clean Energy, Goal 8, Decent Work and Economic Growth, and Goal 11, Sustainable Cities and Communities.

Reducing traffic congestion along port corridors improves public health by minimising air pollution from idling trucks and addressing unsanitary roadside conditions for drivers and nearby communities.

Enhancing the efficiency and sustainability of invoicing practices will lower waiting times and help reduce port gridlock, promoting sustainable consumption and production patterns, ultimately contributing to responsible resource utilisation.

Efficient port access supports uninterrupted cargo flow, enhances worker productivity, and reduces business costs, which are all vital for sustaining economic growth and decent employment conditions.

Addressing port corridor gridlock contributes to cleaner, more organised urban spaces, aligning with efforts to make port-adjacent cities like Lagos more inclusive, safe, and resilient.

(I) Improving the Public Procurement System of Nigerian Ports Authority through Automation

Mr. Japheth Chinyere Chinweuba (author), Senior Manager, Procurement, Nigerian Ports Authority

Mr. Usman M. Farouk (mentor), Principal Manager, Procurement, Nigerian Ports Authority

Author biography

Mr. Chinyere is a procurement professional with over 15 years' experience in contract negotiation, contract management, project advertisement, bid preparation, bid evaluation, procurement planning, record keeping and consultancy. He has gained experience through local and international procurement trainings in the United Kingdom (Leicester in 2012 and London in 2018), Toronto, Canada in 2014 and Casablanca, Morocco in 2024.

Mr. Chinyere holds a master's degree in engineering management (2011) and a bachelor's degree in mechanical engineering (2008) from the University of Benin, Nigeria. He also has an advanced diploma in mechanical engineering from City and Guilds, London (2001). He is passionate about improving the procurement system of NPA through automation with the support of the executive management.

> *My memorable moments were during comparisons of port operations and administrations by our Cameroonian and Ghanaian instructors in their home countries.*

Introduction

Apart from publishing procurement notices on its website, the NPA still relies on a traditional, paper-based procurement process. This approach is often time-consuming, inefficient, and complex. Transitioning to an electronic Government Procurement system could offer numerous benefits, including reduced costs for both bidders and the Authority, time savings, simplified procedures, fewer errors, and increased transparency and competitiveness. It would also enable real-time monitoring of procurement expenditures, enhance record-keeping, and improve the quality of public disclosures.

A review of the procurement system of NPA reveals a cumbersome structure that contributes to delays in contract awards, execution, and payment processes. This research aims to evaluate the timeline of the procurement process of NPA, identify inefficiencies, and propose strategies for improvement. The study focuses specifically on procurement, legal, and payment records from 2017 to 2023, as key procurement activities are centrally coordinated at the Authority's headquarters.

Analysis

This study highlights the urgent need for the NPA to modernise its procurement processes through strategic digital transformation and workforce development

The timeline for Open Competitive Bidding consistently exceeded the standard threshold set for all procurement categories. From 2017 to 2019, the average bidding period ranged from 256 to 285 days—well above the approved 120-day limit. In 2018 alone, there was an average delay of 53 additional days for project approvals. As a result of these delays, eight projects underwent contract variations, leading to increased costs totalling 336 million Nigerian Naira (NGN) between 2017 and 2023.

Similarly, average payment periods during this period ranged from 70 to 95 days, contrary to the stipulated 60-day timeline. In 2023, contract agreements were signed on average 77 days after contract awards. These extended timelines have largely been attributed to the manual and cumbersome nature of the current procurement processes. Notably, the Nigerian Ports Authority allocated 3.9 billion NGN for stationery and computer consumables from 2016 to 2023.

In 2023, the NPA spent 235 million NGN on digitising procurement records within the Procurement Division. While this investment improved record-keeping, it also raised operational costs without addressing the core inefficiencies of the manual procurement system. A review of procurement personnel revealed an aging workforce with an inverted pyramid age structure. As of December 2023, only 12% of staff were aged 30 or below, raising concerns about knowledge transfer and succession planning.

An analysis of the proposed cost of automating the system, through the deployment of an Enterprise Resource Planning (ERP) solution, estimates the investment at 1.1 billion NGN over a 12-month period. This includes software purchase and licensing, user authentication, hardware infrastructure, application programming interface (API) integration, and staff training. Given that the NPA already uses Oracle E-Business Suite EBS, it is recommended that the ERP be Oracle-based to ensure compatibility.

The projected benefits are substantial:

- A 30% reduction in expenditure on stationery and consumables in the first year
- Estimated savings of 1.1 billion NGN within two years
- Full cost recovery anticipated by the third year of implementation

Additional advantages include shorter procurement timelines, increased operational efficiency, faster contract execution (within 7–14 days), quicker invoice processing, improved records management, broader participation, and cost savings for bidding companies due to reduced travel requirements.

Recommendations

While investments in modern technology are essential, procurement efficiency can only be fully realized with the right number of skilled and dedicated personnel. Therefore, continuous human resource development within the Procurement Division is crucial. This includes forecasting future staffing needs and encouraging in-house mobility by redeploying committed staff from other divisions. Training and mentorship programmes should also be strengthened to bridge the gap in experience and service length, ensuring the availability of qualified substitutes ahead of key staff departures or retirements.

Based on the findings of this study, the following recommendations are proposed:

- Digitalisation of the Procurement System: Deploy Oracle's ERP software, configured as a web-based solution. The system should include additional modules for bid payment and collection, contract execution, and invoice submission. It should also be designed for future integration with the Bureau of Public Procurement's electronic Government Procurement platform once available.
- Change Management Strategy: Implement a structured change management approach to address concerns such as resistance to change, anxiety, and fear of job loss among procurement staff. To maintain motivation and foster active participation, a portion of the cost savings generated from automation could be shared with personnel as part of a performance incentive scheme.

Conclusion

This study highlights the urgent need for the NPA to modernise its procurement processes through strategic digital transformation and workforce development. The current manual, paper-based system has led to significant inefficiencies manifested in prolonged procurement timelines, increased costs, and administrative delays.

While initial steps have been taken towards digitisation, full implementation of an ERP system, coupled with strong change management and human capital planning, will be essential for achieving a streamlined, transparent, and cost-effective procurement framework. A fully automated and well-managed procurement system will not only reduce operational inefficiencies but also enhance service delivery, promote accountability, and better support the Authority's broader mission within the national maritime sector.

Impact and Implementation

Since the completion of this dissertation, tangible steps have been taken toward improving procurement operations at the NPA. In February 2025, three new staff members (with an average age of 28) were deployed to the Procurement Division, marking a positive shift toward addressing workforce aging and capacity gaps.

Additionally, a formal request for the implementation of Oracle Procurement has been submitted to both the General Manager of Information and Communication Technology and the Managing Director, signalling institutional interest in adopting digital procurement solutions and aligning with the study's recommendations.

Sustainable Development Goals

The replacement of paper-based procurement with e-procurement will require the deployment of critical IT infrastructure to drive innovation within the Authority, contributing to Goal 9, industry, innovation and infrastructure. This study supports Goal 12, Responsible Consumption and Production, by reducing physical waste. Goal 13, climate action, is supported as reduced road and air travel by bidding companies will lead to a reduction in carbon emissions. Lastly, Goal16, peace, justice, and strong institutions, is supported by enhancing transparency,

Modernising procurement systems through ERP automation drives innovation, strengthens institutional infrastructure, and enhances operational efficiency at NPA.

The shift from paper-based to digital procurement reduces physical waste and promotes the use of sustainable resources in public sector operations.

Reduced travel for procurement processes and reduced paper use contribute to lowering the Authority's carbon footprint, which is a modest but meaningful step toward climate action.

By enhancing transparency, reducing manual bottlenecks, and enabling real-time monitoring, automated procurement fosters stronger, more accountable public institutions.

(J) Assessment of Factors that Influence Routine Medical Check-Ups in Nigerian Ports

Mr. Markus Susari Musa (author), Chief Medical Officer, Nigerian Ports Authority

Mr. Lawan Jere (mentor), Principal Manager, Procurement retd., Nigerian Ports Authority

Author biography

Mr. Musa is a medical practitioner with a passion for public health. Before his university studies in medicine, he went to the College of Health Technology where he was trained as a community Health Extension worker. This has shaped the way he practices medicine, not just concentrating on individual health, but also on general population health. Mr. Musa was employed by NPA in January 2004 and rose to the position of a Principal Manager, Medical. He was sponsored by NPA to undergo a master's programme in Public Health at the University of Glasgow, Scotland and graduated in 2016. He is presently the Chief Medical Officer of Basket House Clinic, Rivers Ports Complex Portharcourt.

The programme has reinforced the importance of interdisciplinary collaboration. Understanding port management beyond the healthcare sector has enabled me to engage more effectively with port administrators, logistics managers, and policymakers, ensuring that health considerations are integral to operational decisions.

Introduction

Routine Medical Check-ups (RMCs) play a vital role in early detection and prevention of diseases, thereby enhancing employee's overall health and wellbeing, ultimately improving organisational productivity. Despite this well proven benefit of RMC, the availability of this service among employees of the Nigerian Ports authority is not known. This study aims to assess factors that may influence an uptake of RMC amongst employees of the Nigerian Ports authority using Calabar Port as a case study. The findings of the study showed a paradox: while the awareness of RMC amongst employees of NPA, Calabar Port is high, the actual usage of the offered service is low. This finding underscores the need for targeted intervention to bridge the gap between knowledge and practice.

The study focuses on understanding the barriers to Routine Medical Check-ups which focus on the health and general well-being of employees. In doing so, the research seeks to contribute to improved health outcomes for NPA employees, better aligning employee welfare with the goals of NPA and wider improved health promotion in Nigeria.

Analysis

Given the risks of ageing workforce, it is crucial to promote regular checkups to ensure health and wellness of port workers

The results of this study show that almost 40% of survey respondents were above 50 years of age while 10% were below the age of 30 years. This indicates an aging workforce, with a significant portion of employees approaching retirement in the near future. An issue of worry remains the fact that the aging workforce is a burden to management as advanced age is closely associated with chronic non-communicable diseases, particularly hypertension and diabetes which have been frequently identified across records of all NPA port clinics. These chronic non-communicable diseases require constant management and a series of lifelong medications, thus implicating an additional financial burden to the Authority. Under this study, the male to female ratio of respondents was 4:1, showing that the employee population is skewed.

100% of the 173 surveyed NPA employees responded that they are indeed aware of the need for RMCs to ensure a minimum level of health. The survey also made clear the fact that employees involved in the study know that RMC costs are covered by NPA port clinics for NPA employees (non-employees may still utilise NPA port clinic services, however they will incur the costs). Knowledge of the availability of RMC is spread through the use of advertising via television, radio, internet, word of mouth, and the medical workers themselves. Despite the high awareness level, the usage of this very important exercise does not reflect it. Two-thirds of the respondents who engaged in Routine Medical check-ups are Nigerian Ports Authority staff.

Figure III.15
Summary of Annual Wellness Screening in Calabar Port

Year	No. of Employees Screened	Male	Female	Total staff in clinic	% usage
2020	180	150	30	30	60
2023	113	97	97	16	36
2024	163	144	144	19	53

Source: Courtesy of the Occupational Health Department, Calabar Port.

Despite the high level of knowledge among the employees of Calabar Port, the use of NPA offered RMC does not align with the knowledge level. The barriers to undertaking Routine Medical Check-ups include a lack of time, fear of the outcome of the tests, and the costs of tests (for non-employees).

Routine Medical Check-ups are important because they can lead to the early detection and prevention of underlying diseases before they become severe and costly. This ultimately leads to a healthier workforce population and cost savings for the port clinics down the line. The medical benefits

of RMC also play a role in employee well-being thanks to greater awareness of one's health and an overall healthier lifestyle. This will assist in reducing absenteeism in the port, further assisting worth port efficiency. Additionally, workers in poor health may be more prone to accidents, where healthier workers are more alert and capable of following safety protocols. A reduction in accidents will further factor into increased efficiencies across NPA ports and a savings in costs associated with accident recovery and loss of time in operations. Lastly, offering health services as part of employee benefits can increase job satisfaction and loyalty, improving employee retention rates. By implementing a strong healthcare system, the NPA boosts its image as a responsible employer, which leads to improved relationships with unions and the public, having positive effects on corporate image.

Recommendations

The aim of this study is to convince and incentivise NPA that increased Routine Medical Check-ups are necessary. The main recommendation of this study is for NPA to encourage its staff to utilise the availability of RMC at the port clinics.

1. The recommendations presented to the management are as follows:
2. The complete automation of the clinics, Authority-wide. This process has done well so far at the Headquarters' Bode Thomas Medical Centre.

The Annual Health Assessment programme anchored by the Department of Occupational Health should be revamped by the management by making monies available for awareness campaigns and the purchase of reagents for the tests. A memo from the management will encourage employees to come out for the health assessment.

Notwithstanding, an increase in RMC participation would necessitate the need for increased medical staff, equipment and other associated costs. In understanding the beneficial reasons for the utilisation of RMC, alongside the survey findings which revealed a major lack in participation in RMC by NPA staff, a cost-benefit analysis was established to cement the recommendation that NPA staff utilise RMC more often. This analysis compared the annual running costs of an increased medical presence in NPA ports (figure III.16) to the financial benefits of staff utilisation of RMC increasing (figure III.17).

Figures III.16
Cost of increasing Routine Medical Check-ups per annum

Cost component	Cost per unit (NGN)	units	Total cost (NGN)
Medical Equipment & Supplies	500 000	1	500 000
Salaries for Medical Personnel	6 000 000	1	6 000 000
Laboratory Tests (10,000 NGN/employee)	10 000	303 (no. employees)	3 030 000
Facility Maintenance	1 500 000	1	1 500 000
Administrative Costs	500 000	1	500 000
Total Annual Costs			11 530 000

Source: Author

Figure III.17
Benefit of uplifted employee health per annum

Benefit Component	Benefit Per Unit (NGN)	units	Total Benefit (NGN)
Productivity Gains (NGN50,000/employee)	50 000	303 (no. employees)	15 150 000
Savings from early detection of health issues	3 000 000	1	3 000 000
Reduced Absenteeism	2 000 000	1	2 000 000
Total Annual Benefits			20 150 000

Source: Author

By comparing the annual costs with the annual financial gain, a net benefit of 8.6 million NGN is realised. These financial savings can be put back into the Authority.

Conclusion

It is evident that RMCs are not only vital for reducing long-term healthcare costs for the NPA, but also for safeguarding employee well-being, particularly in a labour-intensive environment where healthier staff contribute to improved participation and productivity across the ports. While the NPA has made commendable efforts by including RMCs in its medical services, the current challenge lies in insufficient communication to staff regarding both the availability and importance of these check-ups. Strengthening awareness and engagement around RMCs will be essential to maximizing their impact.

Impact and Implementation

Currently, there is a newly established strong interdepartmental collaboration between the Medical Department and other units to promote greater awareness of Routine Medical Check-ups among employees. The Clinic regularly organises health talk sessions to encourage employees, pensioners, and their dependents to undergo annual RMCs. Furthermore, management meetings now feature a dedicated agenda item focused on employee health and well-being.

> *I look forward to mentoring future participants, sharing insights from my research, and contributing to discussions on health and safety in port environments.*

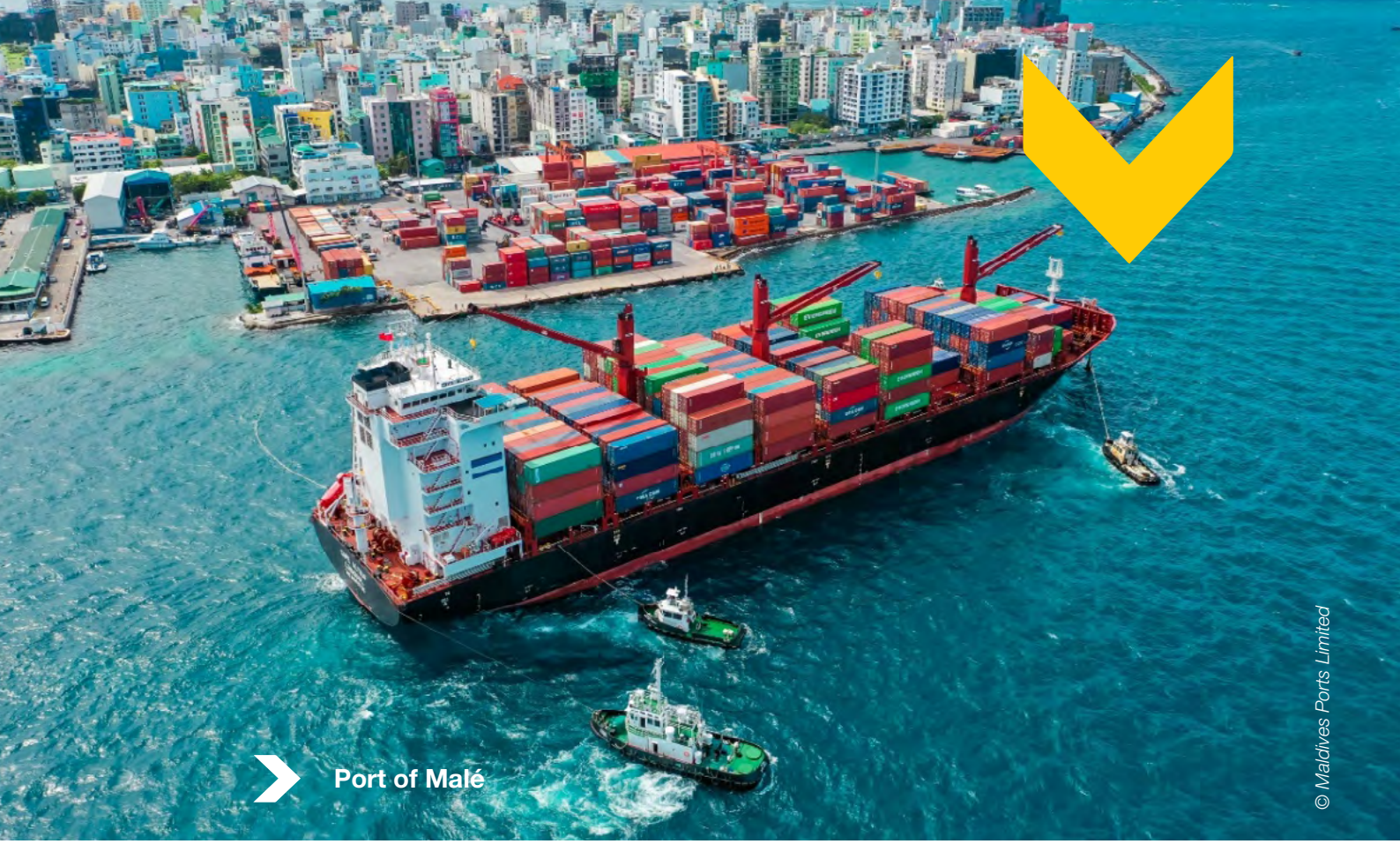
Sustainable Development Goals

This case study supports Goal 3, Good Health and Well-being, by enhancing preventive healthcare access and reducing non-communicable diseases amongst employees of NPA. It also aligns with Goal 8, decent work and economic growth, by improving workforce health and productivity. Additionally, the study contributes to Goal 10, reduced inequalities, by addressing barriers to healthcare access for all employees, irrespective of demographic factors.

Expanding access to routine medical check-ups helps detect and prevent chronic diseases early, ensuring a healthier, more resilient workforce at NPA.

A healthier workforce reduces absenteeism, improves safety, and increases productivity, directly supporting sustainable economic growth in port operations.

By addressing barriers to healthcare access, NPA ensures that all employees, regardless of age, gender, or job role, benefit equally from preventive medical services.



Port of Malé

Maldives Ports Limited

Located in the heart of the Indian Ocean, Maldives Ports Limited (MPL) serves as the primary gateway for international trade to and from the Maldives. Strategically situated in Malé, the nation's capital, MPL plays a vital role in facilitating most of the country's imports and exports, supporting both the national economy and the daily lives of island communities.

As a tiny island nation surrounded by the vast Indian Ocean, the Maldives is inherently reliant on maritime connectivity for its survival and prosperity. Embracing this unique geographic reality, MPL has established and continues to maintain a robust, adaptive port network that connects the northern and southern atolls. By ensuring seamless integration between international shipping routes and domestic transport systems, MPL strengthens national supply chains and enables the efficient movement of cargo between islands—serving as the economic lifeline of the archipelago. This strong maritime foundation, shaped by our natural location, not only meets present-day demands but also positions the Maldives to unlock future opportunities in regional trade and sustainable development.

MPL is committed to shaping a modern, sustainable, and reliable port system that meets the evolving demands of maritime trade. Positioned at a key maritime crossroads in the Indian Ocean, MPL recognises its responsibility not just as a gateway for commerce, but as a leader in environmental responsibility and operational excellence.

Environmental sustainability is a key pillar of the long-term strategy of MPL. The company is actively enhancing its operations with cleaner technologies, including low-emission machinery, solar energy systems, and improved waste management practices.

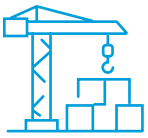
These ongoing efforts reflect the broader ambition of MPL to align with global trends in greener port operations and minimising environmental impact while building more resilient and energy-efficient infrastructure.

In parallel, MPL is embracing digital transformation to improve transparency, service delivery, and efficiency. The adoption of automation, digital platforms, and port community systems is streamlining workflows, strengthening communication, and supporting reliable, customer-focused services. These initiatives reinforce a culture of professionalism, continuous improvement, and accountability.

MPL places strong emphasis on knowledge sharing and continuous professional development as key drivers of operational excellence. MPL actively engages in international capacity-building initiatives, including the UNCTAD TrainForTrade Port Management Programme and the Commercial Law Development Program of the United States of America.[2] These platforms provide MPL personnel with exposure to global standards, legal frameworks, and evolving trends in port governance and trade facilitation.

Beyond formal partnerships, MPL fosters a dynamic learning environment through a mix of internal training programmes, knowledge exchange visits to other port sites, and participation in specialised workshops. These experiences not only broaden professional expertise but also reinforce the commitment of MPL to high performance, legal compliance, and continuous improvement.

Tonnes of trade
130 124



TEUs
64 624

[2] More information available at https://cldp.doc.gov/about-cldp

© Maldives Ports Limited

Maldives Ports Limited has been a proud partner of UNCTAD Port Management Programme, TrainForTrade, since 2009. This collaboration has significantly enhanced our port management expertise and supported the sustainable development of the Maldives and the broader maritime community. As part of the TrainForTrade programme, MPL, alongside the Health Protection Agency, Maldives Customs Service, and Maldives Immigration, has successfully trained over 50 participants, with over 25% being women. Many MPL Port Management Programme graduates have advanced to senior management positions, where they continue to shape the future of the Maldivian maritime sector, driving operational improvements and strategic decisions.

In 2024, MPL relaunched Cycle 3 of the Programme after a twelve-year hiatus, reinforcing our long-term commitment to professional development and excellence in port management.

Furthermore, MPL recently participated in UNCTAD TrainForTrade's Coaching Workshop, designed to empower the next generation of trainers in the Maldives. This coaching initiative, which included representatives from Maldives Ports Limited, Maldives Customs Service, Maldives Immigration and Maldives State Shipping, has trained 22 executives by 2025, equipping them to support future cycles within the English-speaking network and contribute directly to the ongoing success and capacity-building efforts of the Programme.

Deputy Commissioner of Police (Retd.) Mohamed Rishwan, CEO, Maldives Ports Limited

Port of Manila

Philippine Ports Authority

The Philippine Ports Authority (PPA) is a Government-Owned and Controlled Corporation under the Department of Transportation. The PPA was established on July 11,1974 with the issuance of Presidential Decree (P.D.) No. 505, which was amended on December 23, 1975, with the issuance of P.D. No. 857, also known as the PPA Charter. The P.D. No. 857 broadened the scope and functions of PPA to facilitate the implementation of an integrated programme for the planning, development, financing, operation, and maintenance of ports or port districts for the entire country. In 1978, the Charter was further amended by Executive Order No. 513, granting the police authority to the PPA, the creation of a National Ports Advisory Council to strengthen cooperation between the government and the private sector, and the empowering of the PPA to impose reasonable administrative fines for specific violations of its rules and regulations. Subsequently, in 1987, by virtue of E.O. No. 159, the PPA was granted financial autonomy and vested with the function of undertaking all port construction projects under its port system.

As a government agency, PPA strives for positive growth and inclusive development in adherence to its mandate. These ideals can be achieved through a clear vision of institutional targets and a dynamic management and workforce that are deeply committed to excellence in service.

The mission of PPA is to provide modern, sustainable, and resilient port infrastructure and facilities; provide responsive, reliable, and efficient port services; and promote a regulatory framework that is transparent, fair, and relevant to the needs of all stakeholders in pursuit of a national port development programme. By 2030, the PPA, as part of an integrated transport and logistics system, shall have provided port facilities and services in line with global best practices and a port regulatory environment that supports national development.

In 2024, the Authority commemorated its Golden Jubilee. Eleven general managers have steered the PPA in its five decades of existence. At present, PPA is headed by its 11th General Manager, Atty. Jay Daniel R. Santiago, supported by three general managers, 25 port managers and 16

department managers. Of 41 responsible centre heads, 14 are women managers comprised of seven port and seven department managers. PPA has 25 Port Management Offices (PMOs) and 82 terminal management offices under its jurisdiction.

In recent years, PPA has been implementing an infrastructure-building programme to increase its port capacities. Moreover, PPA strongly embarked on port digitalisation, a Green Port programme and disaster preparedness and resilience efforts. It continues to achieve milestones in terms of ship calls, passenger volumes, cargo revenues, total taxes paid, and dividend remittances. What is more, during the COVID-19 pandemic, PPA ensured that all ports under its jurisdiction remained open to facilitate the smooth flow of cargo to and from the country's trade partners, strongly supporting the national response to COVID-19 through the provision of treatments, recovery, quarantine facilities and crew change hubs. PPA maintains strong financial performance and dividend remittances to national finances and is recognised as one of top contributors to the country's economic growth, enhancing the quality of life of Filipino citizens.

In line with international maritime stakeholders, PPA has adopted the 25-year Port Development Roadmap to adapt to the rapidly changing port industry landscape. PPA remains committed as a dependable partner in steering the nation towards progress.

© Philippine Ports Authority

In 2013, the Philippines, through PPA became a member of UNCTAD TrainForTrade Port Management Programme's English-Speaking Network. To fully reap the benefits of the Port Management Programme, PPA officially incorporated its programmes into the 10-year Development Plan of PPA Personnel on Priority International and Local Programmes for Academic Years 2016-2025.

Since then, the PPA has sent scholars to five batches of Training of Trainers (ToT) Workshops, locally implemented three batches of Coaching Workshops and five cycles of the Modern Port Management course. These programmes were made accessible to both personnel of the Authority and port terminal operators and stakeholders.

A total of 163 port personnel benefited from the capacity building opportunities offered by the UNCTAD TrainForTrade Port Management Programme since 2013. 27 senior and middle managers attended the ToT Workshops, 45 participated in the Coaching Workshops and 91 successfully completed the course on Modern Port Management.

While the port sector remains a male-dominated industry in the Philippines, the PPA actively promotes gender equality and women empowerment through different initiatives. Particularly, PPA puts importance on female participation in these kinds of capacity-building programmes. 37%, or 60 women employees, have so far benefited from these programmes. The PPA intends to further increase women's participation in more leadership training locally and abroad.

The PPA, together with other port authorities, terminal operators, and other port stakeholders, has been very appreciative of more than a decade of this wonderful partnership with UNCTAD TrainForTrade and its European port partners. The programmes are great avenues for us to collaborate and forge linkages and friendships with other local port industry partners and port experts of the English-Speaking Network. The support of UNCTAD through its capacity building programmes is an immense opportunity for the port industry to capitalise on the knowledge and expertise of various port experts as well as learn from the best practices of the different ports in the world in managing modern ports.

The PPA sees the value of the learning gained by its personnel from the various TrainForTrade Port Management Programme programmes. There have been significant career movements of personnel who are graduates of the programme. At present, 15 graduates are now holding executive and management level positions. Five of them are women managers.

Also, in recognition of the added value element of the studies completed by our personnel, the Authority adopted one of the key recommendations of Acting Port Manager Fernando B. Mapalo, Jr.'s dissertation. In 2018, PPA issued Administrative Order No. 05-2018 otherwise known as "The Port Environmental Policy" which provides for all environmental activities and strategies in the PPA to be consolidated in one source to be reviewed, amended and approved by the Board of Directors on a regular basis." The policy seeks to strengthen the Authority's pursuit of ensuring that the port activities are focused on minimising the adverse or negative impact on the environment and that all aspects of port operations and port development are geared towards the protection and preservation of the environment for the maximum utilisation of port facilities.

PPA aims to train more port employees and prepare them for the growing complexities of port operations and management, alongside the challenges of globalisation, environmental issues, emerging pandemics and other concerns that impact our ports, logistics and supply chains.

Atty. Jay Daniel R. Santiago, General Manager

(K) Assessment of the reduction of greenhouse gas emissions in compliance with MARPOL73/78 through the establishment of shore-to-ship power in the Port of Ormoc

Ms. Kristine V. Darunday (author), Division Manager C, Philippine Ports Authority Port Management Office Western Leyte/Biliran

Mr. Manuel A. Boholano (mentor), Port Manager, Philippine Ports Authority

Author biography

Ms. Kristine Velasco Darunday has been a Division Manager for the last 7 years, having started her career at PPA in 2001. Her numerous assignments in various ports within the PMO of Western Leyte/Biliran have exposed her to varied situations and challenges.

During her assignment at the Terminal Management Office of Isabel, which oversees the operations of the private ports of PASAR and Philphos, she managed various government ports and gained valuable insights into both private and public port operations. This experience made Ms. Darunday increasingly aware of how port operations contribute to environmental pollution.

Currently, Ms. Darunday is closely collaborating with the engineering department for the technical design and specification to further her studies. Consultation and dialogue with shipping operators are also underway in support of this project in an effort to bring her hard work to fruition with her strong passion and dedication to her studies.

> *The UNCTAD Port Management Programme has profoundly shaped my professional development and personal growth. This experience has ignited my determination to actively seek solutions to tackle a pressing global issue: climate change. I am more committed than ever to contributing to efforts that mitigate its impact.*

Introduction

The purpose of this study is to assess the reduction of GHG emissions in ports and its effect on the environment. This study discusses ship operations and how they contribute to developing air pollutants, which damage the environment if not mitigated. The Philippines, as a developing country with a mainly agriculture-based economy, is particularly vulnerable to major calamities which will impact the economy and well-being of the country.

The Port of Ormoc is in the Province of Leyte, and runs a traditional operational model commonly described as "landlord port." This port is under the PMO Western Leyte/Biliran, formerly known as PMO Ormoc. It is a 17-year-old PMO built in 2005. Today, Ormoc has 80 regular employees and 71 outsourced personnel.

Port of Ormoc

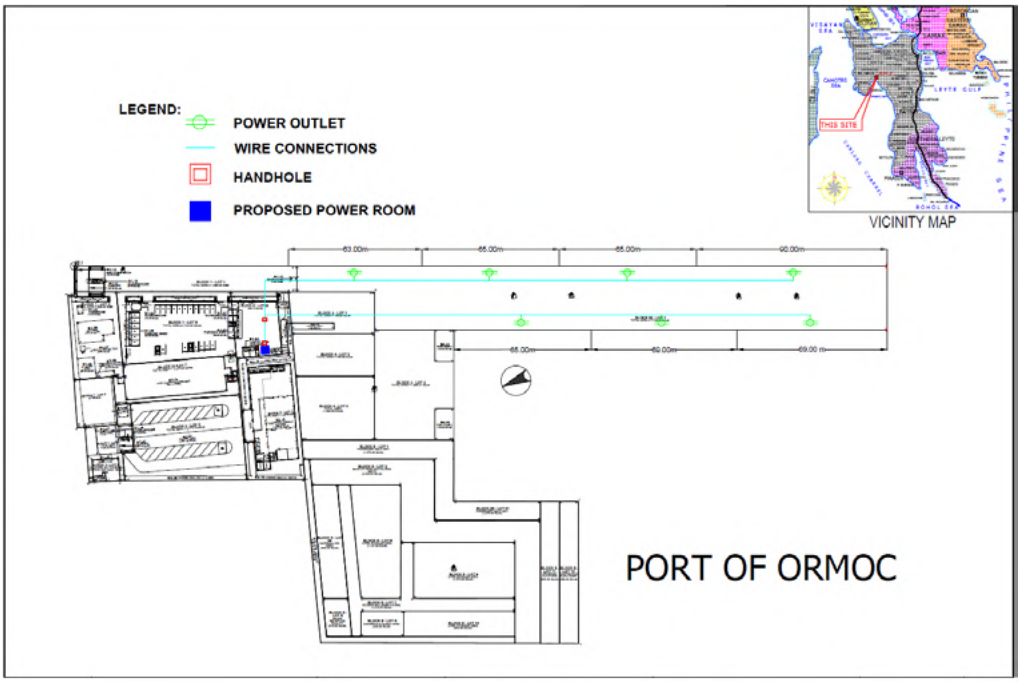
Source: Philippine Ports Authority- Port Management Office Western Leyte/Biliran: Port Police Division File

The study assesses the reduction of GHG emissions achieved through the implementation of shore-to-ship power connections in ports. In addition to assessing emissions released by vessels while at berth, the study also examines the broader environmental impact of port operations. It is revealed that vessels at berth are the main source of pollution in port operations.

To protect the environment, it is essential to ensure straightforward and efficient port operations, such as the provision of vessel services, enforcement of procedures and regulations for passenger embarkation and disembarkation, cargo loading and unloading (including temporary storage), and the oversight of port personnel. As a key link between vessels and shippers or consignees, the PPA recognises its vital role in upholding environmental standards. Accordingly, respecting the rules and regulations enforcing both national and international environmental protection policies is a fundamental responsibility of the PPA.

Not only is it a serious threat to the planet and people, but climate change is also threatening the global economy. It is crucial to strengthen collaboration between public and private sectors to guarantee and drive the development of sustainable economic growth. As demonstrated in Figure III.18, the Port of Ormoc is well orientated to implement modern shore-to-ship power connections.

Figure III.18
Port of Ormoc Layout



Source: PPA-PMO Western Leyte/Biliran: Engineering Services Division File

Analysis

Shore-to-ship power is a relatively easy set-up, where a vessel docked in port is plugged into an onshore electric power source. The shoreside power load is transferred to the ship's power supply without disruption to on-board services. This permits the vessel to turn off electricity producing generators, allowing vessel emissions to the local surroundings to be eliminated.

As ports face stricter emission regulations and rising volumes of goods and passenger traffic, shipping companies, port owners, and operators are seeking ways to minimize environmental impacts while improving energy efficiency, productivity, and the sustainability of port operations. Fresh thinking leads to the advent of smart-port concepts, enabling successful shore-to-ship power supply solutions.

Introducing smart-port infrastructure and shore-to-ship power systems helps to make ports and shipping companies more competitive, profitable, and ecologically viable.

Figure III.19
Estimated Greenhouse Gas emissions in the Port of Ormoc

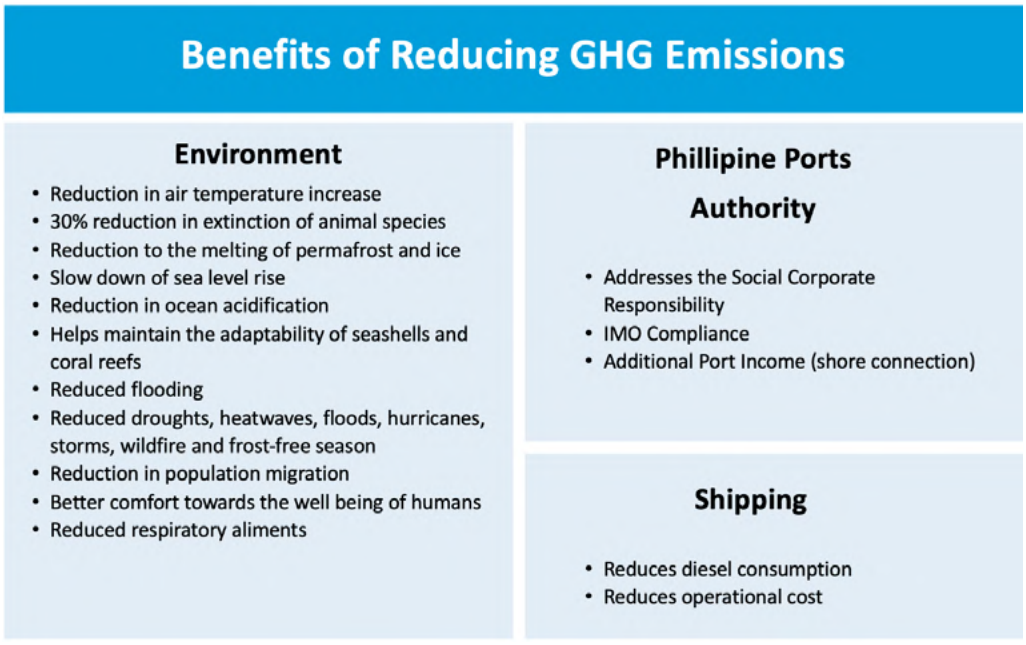
	2020	2021	2022	2023	2024
Vessel calls	5,664	5,518	5,543	5,575	5,854
Stay time (4hrs/vessels) hours	22,656	22,072	22,172	22,300	23,415
Diesel consumed @ 150 KVA genset 36 litres/hour (litres)	815,616	794,592	798,192	802,800	842,940
Co2 GHG emissions in litres/ year (2.7kg of Co2/litre) (kg)	2,202,163.20	2,145,398.40	2,155,118.40	2,167,560.00	2,275,938.00
Total Co2 GHG emissions (metric ton/year)	2,202.16	2,145.40	2,155.12	2,167.56	2,275.94

Source: Author

The number of ships calling at the Port of Ormoc has been increasing annually since 2021 (Figure III.19). An increase in port operations, particularly when vessels berth, means an increase in pollutants. The proposal to invest in appropriate shore-to-ship power connections is one of many solutions which will help protect the environment, improve health and welfare of locals, and tackle global warming.

In comparison with some the largest ports in the Philippines, such as the Port of Cagayan De Oro and Port of Iloilo, figures for the Port of Ormoc suggests a very low inventory of GHG emissions from vessels at berth. By using Ormoc as a pilot, the implementation of the recommendations in this study may work to encourage PPA management to undertake similar ventures, enabling other PMOs to adopt comparable technologies for reducing overall emissions.

Figure III.20
Benefits of reducing Greenhouse Gas emissions



Source: Author

Additionally, as a designated Smoke-Free City, Ormoc would doubly benefit from a strategic undertaking by the PPA to both adopt shore-to-ship power solutions and join the local initiative, strengthening ties with the local government.

The PPA is gearing towards green and smart ports and promotes sustainable development. Now is the time to integrate the ship-to-shore connection as part of the sustainable port development of PPA.

Through this programme, I share my knowledge and influence with other employees by conducting eco-seminars. I also serve as a member of the Technical Working Committee of the PPA Port Environmental Code. Step by step, I have implemented green port initiatives in my area of interest, including planting more trees and using recycled materials within port premises.

Recommendations

The study recommends the Port of Ormoc adopts shore-to-ship capabilities on its quaysides in order to reduce the amount of air and sea pollution from berthed vessels.

The biggest challenge in taking on this recommendation is financing. As it is considered a major project for the Port of Ormoc, the Authority should seek help from the national government in the same vein as many European countries do to receive aid from the European Union for the establishment of ship-to-shore connections.

Furthermore, it is recommended that the base Port of Ormoc, PMO Western Leyte/ Biliran, implement a Port Terminal Regulatory Framework through a concession under Tier 3. A fifteen-year contract could serve as an opportunity to require selected port operators to implement shore-to-ship connections as part of its environmental compliance obligations with the PPA.

Conclusion

Shore-to-ship connections at the Port of Ormoc is a solution that will strongly help protect the environment and future generations. Based on different studies mentioned in this paper, it is evident that ship operations at berth have a significant impact on climate change. Shipping operations are the lifeline of the global economy, and it is time to demonstrate commitment to the environment by integrating the shore-to-ship connection in domestic and international ports. By implementing the ship-shore connections, the Port of Ormoc can demonstrate its efforts to achieve SDGs.

Impact and Implementation

Ms. Darunday is currently designated as a focal person and representative of the Sustainable Infrastructure for Low-Carbon Climate Resilient Development in Asia, which will form part of the national roadmap study on decarbonising pathways for freight transport in the Philippines.

Sustainable Development Goals

The study supports Goal 7, affordable and clean energy, by promoting the use of shore-to-ship power as an alternative to diesel-powered generators. Switching from diesel generators to shore-to-ship electric power in the Port of Ormoc ensures cleaner, more efficient energy use, supporting sustainable maritime operations.

The research contributes to Goal 13, climate action. Reducing greenhouse gas emissions from berthed vessels at the Port of Ormoc directly mitigates climate change, safeguarding both the environment and local communities.

Furthermore, the research aligns with Goal 14, life below water. Reducing the discharge of harmful pollutants such as oil residues and exhaust particulates from berthed vessels helps protect Ormoc Bay's marine life for the healthier coastal ecosystems.

(L) Assessment of the Flow and Movement of Passengers at the Port of Zamboanga

Mr. Aishar Y. Hadjirul (author), Acting Administrative Division Manager, Philippine Ports Authority Port Management Office -Zamboanga

Mr. Rey T. Del Moro (mentor), Acting Port Manager, Philippine Ports Authority Port Management Office -Siquijor

Mr. Arvin D. Dadulo (mentor), Division Manager, Philippine Ports Authority Training Center

Author biography

Mr. Aishar Y. Hadjirul, a registered electrical engineer with a master's degree in public administration, began his career at the PPA PMO-Zamboanga in 1990. He is recognised as one of PPA's Subject Matter Experts in port operations, safety, health, and environmental management. Additionally, he is a cadre on Incident Command Systems and frequently invited as a resource person by the Regional Disaster Risk Reduction Management Council of Zamboanga Peninsula. In 2021 during his tenure as the Chief Safety Officer of PMO-Zamboanga Mr. Hadjirul successfully completed and defended his dissertation for the UNCTAD PMP as part of cycle 3. Mr. Hadjirul remains committed to developing his knowledge particularly in port management. In December 2023, Mr. Hadjirul was designated Acting Administrative Division Manager of PMO-Zamboanga.

My understanding of the concepts, coupled with my appreciation for best practices across numerous ports during the UNCTAD PMP, enabled me to effectively identify the needs of port stakeholders and clients, ensuring efficient allocation of resources.

Introduction

The PPA, PMO-Zamboanga, established on June 1, 1977, has the responsibility of operating and maintaining the Port of Zamboanga and other ports and harbours in the Zamboanga Peninsula.

Located in the southwestern part of the Philippines, the Port of Zamboanga plays a vital role not only as the maritime trade centre for the nearby island provinces of Basilan, Sulu, and Tawi-Tawi, but also as a hub port for sea transport connecting to other major ports in the country. The port is strategically significant as it connects the Philippines to neighbouring countries, thanks to Zamboanga City as one of the selected urban centres for the Brunei-Indonesia-Malaysia-Philippines East ASEAN Growth Area – a cooperation that aims to enhance trade, tourism, and investment among member countries.

The port primarily handles vessels that carry both cargo and passengers. Statistical reports show that from 2015 to 2019 the number of passengers increased from 2.7 to 3.3 million respectively.

Common practice at the Port of Zamboanga allows private vehicles to pass through the port's main road to the Passenger Terminal Building (PTB). Due to the proximity of this service road to the berthing facility, private vehicles are sometimes seen dropping off passengers near a vessel without proceeding to the PTB. The same access road also serves as the main route for cargo vehicles and equipment.

Passengers are encouraged to utilise the transport vehicles provided by the shipping companies, however, many prefer to go directly to the vessels themselves, especially if it is already berthed. Similarly, when disembarking, passengers often leave the port by walking through the busy operational areas. This is highly dangerous as often results in passengers congregating in the operational areas, creating congestion on the access road (see photos below).

Areas of operations, embarkation and disembarkation

Source: Author

As passenger traffic increases, the responsibility of the PMO becomes more challenging, especially when pedestrians, vehicles, and equipment share the same space inside the premises; a situation that could induce damage, injury, and even death.

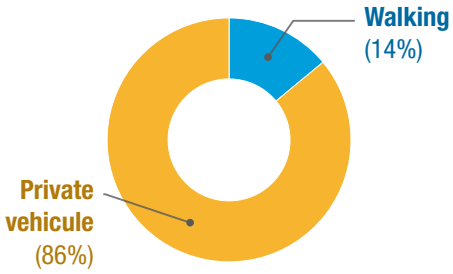
This dissertation evaluates the flow and movement of passengers within the port premises, identifying their needs while using the port facility. The study employs accident analysis and research methodologies, including surveys, monitoring, and interviews.

The information gathered was validated through field observations and unstructured interviews with employees who are directly involved in port operations.

Analysis

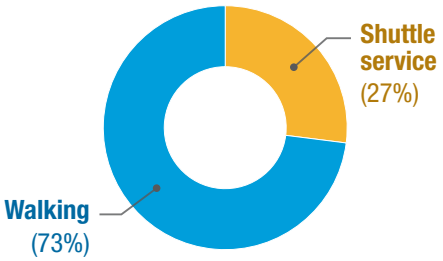
Survey results in Figure III.21 show that 86% of the departing passengers gained access to the port and the PTB via private vehicles. On the other hand, Figure III.22 shows that 73% of passengers inside the PTB preferred to walk rather than wait for transport vehicles.

Figure III.21
Survey – How passengers arrive at port



Source: author

Figure III.22
Survey – If passengers walked or used shuttle service

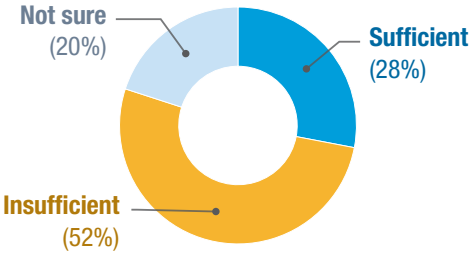


Passengers who opted to walk through the operational areas cited the main reason being the long queues, due to a lack of transport vehicles. The survey also identified other conditions and problems:

- Inadequate walkways or existing walkways without a protective barrier
- Insufficient traffic and safety signage
- Presence of moving vehicles and equipment
- Exposure to heat and rain
- Hazards due to the movement of cargo handling machinery
- Potential health and safety issues arising from the presence of scattered cargoes

PMO-Zamboanga's 2016 to 2019 records reveal that most accidents that affected passengers involved vehicles, equipment, and cargo-handling gear. Finally, the survey confirmed that the management of passengers' safety inside the port was insufficient, with 52% respondents citing it insufficient, compared to only 28% who said it is satisfactory (see Figure III.23).

Figure III.23
Survey – Management of Passenger safety



Source: Author

Recommendations

Based on the research, the study proposes following recommendations:

1. Transport services

Increase the number of shuttle services to meet the demand, especially during peak seasons and inclement weather. Introduce service level agreements to help ensure the availability of transport vehicles by the PTB operator or an authorized ancillary service provider.

2. Pedestrian facilities

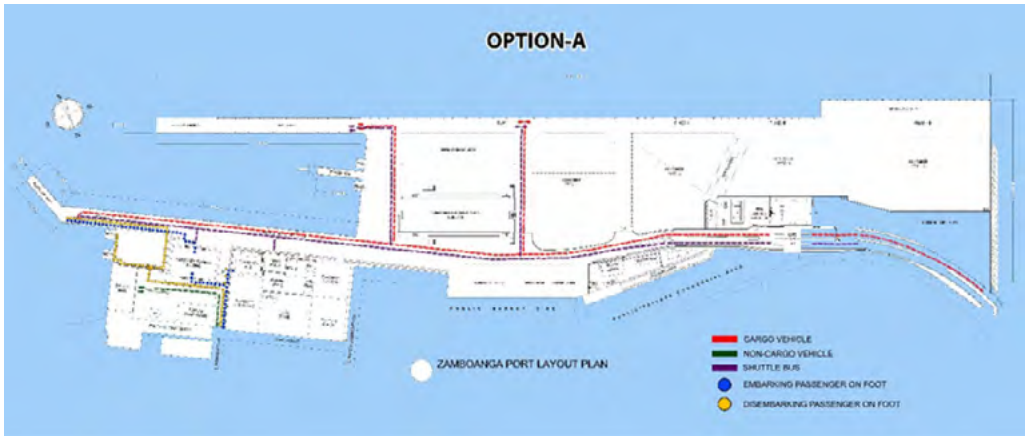
Improve the pedestrian facilities by widening walkways, installing roofing and lighting. Install high-visibility signs as well as multilingual signage for people from diverse cultural backgrounds in the region.

3. Traffic management and re-routing of vehicles

- Update and revise the existing traffic management plan to ensure that only cargo vehicles and cargo-handling equipment are allowed to access the main gate.
- Private vehicles and passengers have two options for entering the port:

Option A – Use the entry gate near the PTB. This plan is in coordination with the Local Government Unit (see Figure III.24).

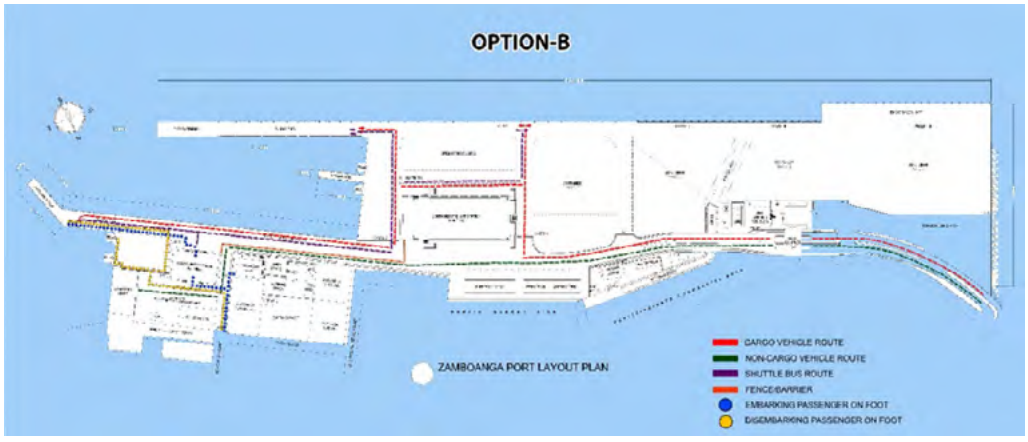
Figure III.24
Option A – Rerouting of Passengers and Private Vehicles



Source: Author

Option B – (If option A is not feasible) allow access to the PTB gate only to foot passengers. Private vehicles must pass the main road inside the port. Install a fence along the Marginal Wharf to separate the service road from the working apron (see Figure III.25).

Figure III.25
Option B – Rerouting of Passengers and Private Vehicles



Source: Author

- Increase the visibility of port personnel at the operational area to facilitate passenger movement and reduce vehicular traffic near berthing areas. Establish a Port Command Centre equipped with monitoring and communication systems.

4. Orientation of personnel

Conduct regular meetings to familiarise port staff with safety and security policies and guidelines. Discuss problems during regular meetings to find immediate solutions.

Conclusion

The study findings indicate that passengers are not only exposed to operational hazards within port premises, but also vulnerable to unfavourable environmental conditions.

The analysis of accidents and observations shared by the passengers and port workers highlights a need for immediate actions to create a safer and more secure environment. Addressing the issues also demonstrates compliance with safety and health regulations, including PPA Administrative Order No. 07-2015 entitled "Implementation of Safety, Health, Environmental Management and Handling of Dangerous Goods in Ports."

Impact and implementation

After presenting the study, Mr. Hadjirul was assigned by port management to take charge of overseeing terminal operations and the temporary PTB. One of the first steps taken was to improve the visibility of PPA operations personnel in the area by working closely with the port terminal operator. At the same time, the PPA police launched a separate initiative to monitor traffic conditions and manage the flow of vehicles on the access roads, aligning with the proposed plan to establish a Port Command Centre.

Presently, Mr. Hadjirul is committed to achieving the remaining recommendations in preparation for the operation of the new PTB which is designed to accommodate up to 3,500 passengers. It was scheduled to be completed in 2024, however, the project experienced delays due to the COVID-19 pandemic, which disrupted both the delivery of materials and the deployment of workers. The new terminal is now expected to be finished by the second quarter of 2026 given the steady preparations in progress.

Sustainable Development Goals

The research supports Goal 3, good health and well-being, as it proposes ways to reduce passengers' exposure to operational hazards and unsafe conditions at the port. By improving pedestrian facilities and providing shelter from unpredictable weather, the study aims to enhance the physical safety and overall well-being of both passengers and workers at the Port of Zamboanga.

This study supports Goal 8, decent work and economic growth. It suggests ways to ensure the safety of passengers and port workers by restricting non-official vehicles from accessing operational areas, preventing accidents with vehicles and cargo-handling equipment.

The research also supports Goal 9, industry, innovation and infrastructure. Improving port infrastructure by upgrading traffic management systems, building dedicated pedestrian walkways, and establishing a new PTB will enhance the resilience and efficiency of port operations while promoting sustainable transport.

(M) Management and Control of Imported Dry Bulk Cement Clinker at the Port of Iligan

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Ms. Engr. Noeme Wong Calderon (mentor), (retd.) Port Manager, Philippine Ports Authority

Author biography

Mr. Pabelonio has been serving as Terminal Supervisor at the PMO of Lanao del Norte/Iligan (LNI) since 2015. From 2018 to 2024, he was designated as Acting Port Services Division Manager.

Mr. Pabelonio began his career with PPA in 1992 as a Clerk Processor. He was promoted to Senior Supply Officer in 2001, then to Terminal Operations Officer in 2003. In 2010, he advanced to the position of Senior Terminal Operations Officer. With over three decades of service in the PPA, Mr. Pabelonio has spent more than 20 years in the Port Services Division where he gained extensive experience in various aspects of port operations.

The Programme broadened my perspective of ports and port operations, promoting professional confidence to meet future challenges.

Introduction

The PMO LNI is one of the PMOs in Northern Mindanao. Its base port, the Port of Iligan, is situated in the heart of Iligan City, a highly urbanised and industrial centre. The city attracts industries due to its abundant and affordable hydroelectric power supply as well as its long shoreline with deep seawater.

The Republic Cement of Iligan Incorporated (RCII) is among the corporations operating a private port under license from PMO LNI. While there is strong demand for cement products of RCII, the company's production capacity is insufficient to meet this demand. As a result, RCII imports cement clinker to supplement its own manufacturing output. Cement clinker is a solid material produced during the manufacturing of Portland cement and serves as an intermediary product. Ordinary Portland cement typically contains up to 95% clinker and 5% gypsum. After gypsum is added, the clinker is ground to produce finished cement.

Although RCII operates its own private port, it faces constraints due to limited back-up areas and ship draft limitations. Expansion is not feasible because the facility is situated between two other private ports. The draft

alongside the berth is only six meters, which is inadequate for foreign vessels transporting clinker that require a minimum draft of 10.5 meters. Consequently, RCII was compelled to divert the unloading of imported bulk cement clinker to the Port of Iligan and transport it by truck to its plant, approximately nine kilometres away.

Figure III.26
Port of Iligan Operational Statistics, Dry Bulk Cargo (Clinker)

Shipping	2013	2014	2015	2016	2017	2018	2019	2020	2021
No. of vessels	9	3	7	8	10	11	0	11	19
Gross Tonnage	171,107	87,211	129,040	180,535	259,937	185,190	-	162,007	479,487
Imported Clinker (metric tonnes)	241,865	95,504	227,459	226,929	383,910	242,990	-	271,421	663,539

Source: Author

As shown in Figure III.26, the volume of imported clinker traffic has generally increased. However, in 2014, RCII experienced major equipment breakdowns that caused the plant to cease operations for most of the year. Similarly, in 2018 and 2019, clinker operations at the Port of Iligan were suspended for 18 months due to serious environmental and operational concerns.

When the Port of Iligan first began handling imported cement clinker in 2013, the activity was welcomed as it brought additional revenue to the PPA and other agencies operating within the port. However, after several years—along with a rise in vessel calls and cargo volume—significant issues began to emerge. One major concern was the reduction in berth draft, which decreased from 12 meters to just 9 meters by 2018. As a result, vessels were required to lighten their loads while anchored offshore before berthing, leading to additional costs and reduced operational efficiency.

More critically, environmental and health issues arose due to the spread of fine airborne clinker dust throughout the port, affecting both workers and port users. This dust pollution ultimately prompted the suspension of operations of RCII at the Port of Iligan for 18 months. Investigations during the dredging of the berth revealed that the draft reduction was largely caused by ongoing clinker spillage into the sea, which had solidified on the seabed.

These issues form the basis of this case study, which aims to achieve the following objectives:

- Manage and control the spillage of imported dry bulk cement clinker and the dispersal of fine airborne clinker dust (20–250 microns) at the Port of Iligan.
- Develop standard operating guidelines for the Port of Iligan and other ports handling imported dry bulk cement clinker and other similar products.

Analysis

A survey questionnaire was distributed to stakeholders to gain a clearer understanding of the situation on the ground. The results of the survey validated earlier complaints raised by port workers and users concerning health issues attributed to the dispersal of airborne clinker dust. Respondents also cited the dust's negative effects on the environment: damage to buildings within the port, and the clogging of drainage systems. Additionally, the survey confirmed concerns about the reduction in berth draft caused by clinker spillage into the sea, which had solidified on the seabed. Respondents also offered insightful suggestions on how to mitigate the spread of clinker dust.

During observation of the discharging operations of cement clinker, it was found that port workers who were directly exposed to cement clinker did not wear proper and

adequate personal protective equipment (PPE) to protect themselves from clinker dust. Large volumes of clinker dust were also released into the environment during the operations due to the equipment's large open covers and flaps which are not fit for purpose for the handling of cement clinker. Clinker also escaped into the sea during discharging because the grab was overflowing, and no net or blanket was in place to prevent the clinker entering the sea. Dust emissions at various points in the process flow were also observed.

The port layout plan revealed that the foreign-vessel berth is located adjacent to a passenger berth which presents a hazard, especially during strong winds when dust can be seen blowing directly towards the passengers getting on and off the ferries.

Benchmarking with Holcim Philippines Incorporated (HPI), another cement company, operating their own private port, revealed that their operation was faster because the clinker was unloaded directly onto the apron without the need for a hopper. Operations of HPI generate large volumes of clinker dust, however port workers are protected as all staff must comply with strict rules on the use of appropriate and high-quality PPEs. HPI has the potential to reduce its negative environmental impact arising from the dispersal of large volumes of clinker dust thanks to its large operational area as well as their distance from neighbours.

Discharging of Cement Clinker

Source: Author

Further analysis against requirements of PMO LNI concluded that introducing a misting system and a nozzle-based fogging system would be the most efficient and practical solution as both use atomized mist to create water droplets within the size range of the clinker, 20-250 microns. The research revealed that an Eco Hopper (Ecological Hopper) is the most appropriate machine to use for cement clinker because it is equipped with a simple but effective dust control system to minimize the escape of dust during the grab discharge cycle.

Lastly one survey respondent suggested the development of a dedicated berth for imported bulk cargo vessels. If implemented, this recommendation could significantly help control dust emissions and enhance overall operational efficiency.

Discharging of Clinker using Eco Hoppers and Vessel's Grab

Source: Author

Recommendations

To address the challenges identified in this study, the following targeted recommendations are proposed:

- **Upgrade PPE:** The PPE currently used by operations personnel should be replaced with high-quality, standard-compliant equipment that can adequately protect workers from the harmful effects of cement clinker dust.
- **Prevent marine pollution:** Crane operators must avoid overloading the equipment during unloading operations to minimize clinker spillage into the sea. Additionally, tarpaulins should be installed between the vessel railings and the wharf to serve as a containment barrier.
- **Reduce onshore spillage:** Haulage trucks transporting clinker should not be allowed to operate while overloaded. Perforated barriers should be installed to clearly delineate the operational area and help contain potential spillage.
- **Enhance dust suppression:** Misting systems and/or nozzle-based fogging systems should be installed near the Eco Hopper to further suppress dust emissions during unloading operations.
- **Develop dedicated berths:** With the ongoing reinforced concrete wharf extension of 99 meters adjacent to Berth 6, it is recommended that this area—comprising Berths 6 and 7 with a combined length of 220 meters—be developed into a dedicated facility for handling imported dry bulk cargo. These berths should maintain an effective draft of 12 meters to accommodate larger vessels.

Misting System

Source: https://bosstek.com/modern-age-of-dust-suppression/

To ensure the consistent and effective application of these recommendations, it is further proposed that the PPA issue a formal guideline entitled: *Proposed Guideline on the Management and Control of Imported Dry Bulk Cement Clinker at the Port of Iligan and Other Ports Handling the Same Cargo*.

A draft of this proposed guideline will be submitted to PPA Management for their review, evaluation, and potential implementation.

Conclusion

This case study addressed significant environmental, health, and operational issues resulting from the handling of imported dry bulk cement clinker at the Port of Iligan. Through comprehensive data gathering, key areas of concern were identified, including dust dispersion, marine pollution, worker safety, and berth draft reduction due to clinker spillage.

The study proposed actionable solutions, such as the use of appropriate PPE, dust suppression systems, operational controls, and infrastructural improvements. Notably, several recommendations have already been successfully implemented by the PMO and the Port Terminal Management Operator, leading to visible improvements in working conditions, environmental management, and operational efficiency. However, some critical interventions—such as the adoption of misting systems, fogging technology, and the use of Eco Hoppers—remain pending approval at the national level. The proposed issuance of official guidelines by PPA management is a key step toward standardizing and scaling up best practices across all ports handling similar cargo.

Impact and implementation

Several of the study's recommendations have already been implemented. These include close coordination with the Port

Terminal Management Operator to ensure the proper use of PPE by operations personnel, enforcement of restrictions on overloading clamp shells, and the installation of tarpaulins to prevent clinker spillage into the sea. Additionally, hauler trucks are no longer permitted to operate while overloaded, and 30–40 ft perforated barriers have been installed to delineate the operational area and serve as dust barriers. A dedicated berth for imported dry bulk cargo has also been designated.

The operator has also taken proactive steps to maintain cleanliness by deploying sweepers to collect escaped clinker dust during and after discharging operations. As a result, the previously severe environmental and health issues caused by airborne and spilled clinker dust have been significantly reduced, though further enhancements remain possible.

A copy of this study has been submitted to the PPA Head Office, and feedback is still awaited regarding the *Proposed Guideline on the Management and Control of Imported Dry Bulk Cement Clinker at the Port of Iligan and Other Ports Handling the Same Cargo*. Likewise, the proposed use of an Eco Hopper and the installation of a misting system or nozzle-based fogging system are pending approval from PPA Head Office.

Sustainable Development Goals

By recommending several measures through the *Proposed Guideline on the Management and Control of Imported Dry Bulk Cement Clinker at the Port of Iligan and Other Ports Handling the Same Cargo* the study promotes Goal 8, decent work and economic growth, by supporting the more cohesive and safe working environments. Maintaining safe, secure working conditions in clinker handling operations sustains economic activity while protecting the health and safety of port workers.

By recommending the current hopper be replaced, Goal 9, industry, innovation and infrastructure, is supported through this work's push for sustainable industrialisation and innovation. The recommendation to redevelop a 220-meter dedicated berth for imported dry bulk cargo with effective draft of 12 meters also supports Goal 9 by providing safe and environmentally sound infrastructure and processes. Modernising port infrastructure with Eco Hoppers and dedicated berths improves bulk cargo handling efficiency and supports sustainable industrial growth.

Furthermore, Goal 14, life below water, is supported by addressing clinker spillage into the sea, which has led to seabed solidification and marine pollution. By introducing containment measures and operational guidelines to prevent clinker discharge, the study safeguards marine ecosystems and promotes healthier coastal waters. Enhancing cargo handling practices and containment measures reduces clinker spillage, safeguarding marine ecosystems around the Port of Iligan.

(N) Building Resilience Against Typhoons and Earthquakes: Protocols and Strategies for Port Management Office Eastern Leyte/Samar

Ms. Jennelyn S. Siosana (author), Chief Safety Officer, Philippine Ports Authority Port Management Office Eastern Leyte/Samar

Mr. Engr. Manuel A. Boholano (mentor), Port Manager, Philippine Ports Authority

Author biography

With 25 years of experience at the PPA, and as a graduate of the UNCTAD PMP, Ms. Sionsana brings a strong foundation of knowledge and practical skills in navigating the complexities and challenges of port operations.

She began a career with the PPA in May 2000 as a statistician. In 2008, she was promoted to Terminal Operations Officer and later, in 2010, took on the role of Environmental Specialist. In 2019, Ms. Siosana assumed the position of Chief Safety Officer, a role she continues to hold to the present day. From 2020 to 2023, she served as Acting Division Manager at the Terminal Management Offices of Guiuan and Borongan in Eastern Samar. Currently, she is designated as Acting Terminal Supervisor, serving in this role alongside other responsibilities.

Coming from a small port in the Philippines, the Programme has instilled in me valuable concepts and insights on modern port management which help me appreciate the importance of ports in global trade and economic development. Moreover, my dissertation has already been forwarded to various responsibility centres in our PMO for comments and additional inputs before its implementation. UNCTAD paved the way for me to be one of the trainers/instructors of the PPA Training Institute to discuss topics about safety, health, environment and port operations.

Introduction

As vital gateways for global trade, climate-resilient ports are essential to safeguarding supply chains

The PMO of Eastern Leyte/Samar (EL/S), originally established as PMO Tacloban in August 1977, is one of the 25 field offices of the PPA. Located in Tacloban City, the capital of Region VIII and centre for commerce, tourism, transportation, education, and government, PMO EL/S serves the diverse needs of its regional constituents.

Ports serve as vital transportation hubs that facilitate the movement of goods and people, while also playing a crucial role in the immediate delivery of humanitarian aid following natural disasters. Consequently, when port operations are disrupted by typhoons, earthquakes or other calamities, economic activity in the affected communities is significantly hampered. The rapid resumption of port services therefore becomes essential to support recovery efforts and maintain supply chain continuity.

The Philippines' geographical location makes it highly susceptible to natural hazards, particularly typhoons and earthquakes. According to the Global Facility for Disaster Reduction and Recovery, the region is classified as having relatively high risk for both types of events. While the major ports under PMO EL/S are critical to regional trade and commerce, they are also located in disaster-prone areas—rendering them vulnerable to operational disruptions and infrastructure damage. Such vulnerabilities pose serious risks to the regional supply chain and emergency response capabilities.

Despite these risks, there are currently no comprehensive strategies or protocols in place to enhance the resilience of PMO EL/S ports against typhoons and earthquakes. This critical gap served as the basis for the present study.

Analysis

While typhoons and earthquakes cannot be prevented, the severity of their impact can be mitigated through appropriate resilience measures. The first step toward building resilience is to evaluate the common threats and hazards affecting ports. For PMO EL/S, typhoons are a regular occurrence, particularly at the end of each year. While the area has not recently experienced major earthquakes, the presence of an active volcano in the region makes seismic activity a continuing potential threat to ports under PMO EL/S.

Based on the impact analysis conducted, disruptions caused by strong typhoons and earthquakes can result in multi-million-dollar losses. These losses include income and financial setbacks for the Authority, its employees, shipping lines, passengers who become stranded, as well as structural damage to port facilities and cargo losses suffered by handlers and consignees.

To meet the objectives of this study, a preparedness assessment was conducted among key stakeholders to evaluate their readiness in the event of such hazards.

In terms of infrastructure, most facilities and structures under PMO EL/S (with the exception of buildings constructed more than 20 years ago) are built to withstand Category 4 typhoons and magnitude 7.0 earthquakes. However, given ongoing environmental changes, there is a strong need to review and potentially revise the design standards of port infrastructure to reduce vulnerability to future disasters. A relevant study by the Japan International Cooperation Agency, *Disaster-Resilient Feeder Ports and Logistics Network in the Republic of the Philippines* (December 2015), emphasised the need to guide funding allocations to enhance the disaster resilience of feeder ports across the country.

Port employees and other stakeholders have been trained in capacity-building strategies and have developed various emergency response and recovery plans. However, they require further support from the PMO in terms of infrastructure for temporarily storing cargo during severe weather conditions, such as warehouses and transit sheds. Although partner agencies are generally aware of

their responsibilities during emergencies, the study found a need to clearly define agencies' specific roles in times of disaster response. In addition, clear protocols and communication channels—both within PMO EL/S and among stakeholders—must be established to ensure effective coordination during emergencies.

The time required for full recovery from port disruptions varies based on the severity of the disaster and the nature of the port itself. The study identified that external factors and interdependencies between infrastructure components play a critical role in the recovery process. Because ports are composed of multiple interlinked systems, there is often overlap and redundancy in operations. All of these components must be considered when assessing port resilience.

A holistic evaluation of the threats and hazards identified in this research provide a foundation for developing strategic tools, policies, and methods to enhance the overall resilience of PMO EL/S against typhoons and earthquakes. A systematic review of preparedness efforts and historical impact data, combined with the key control factors identified in this study, additionally serve as valuable resources for the development of predictive models—such as hazard-specific contingency plans or a comprehensive Public Service Continuity Plan (PSCP).

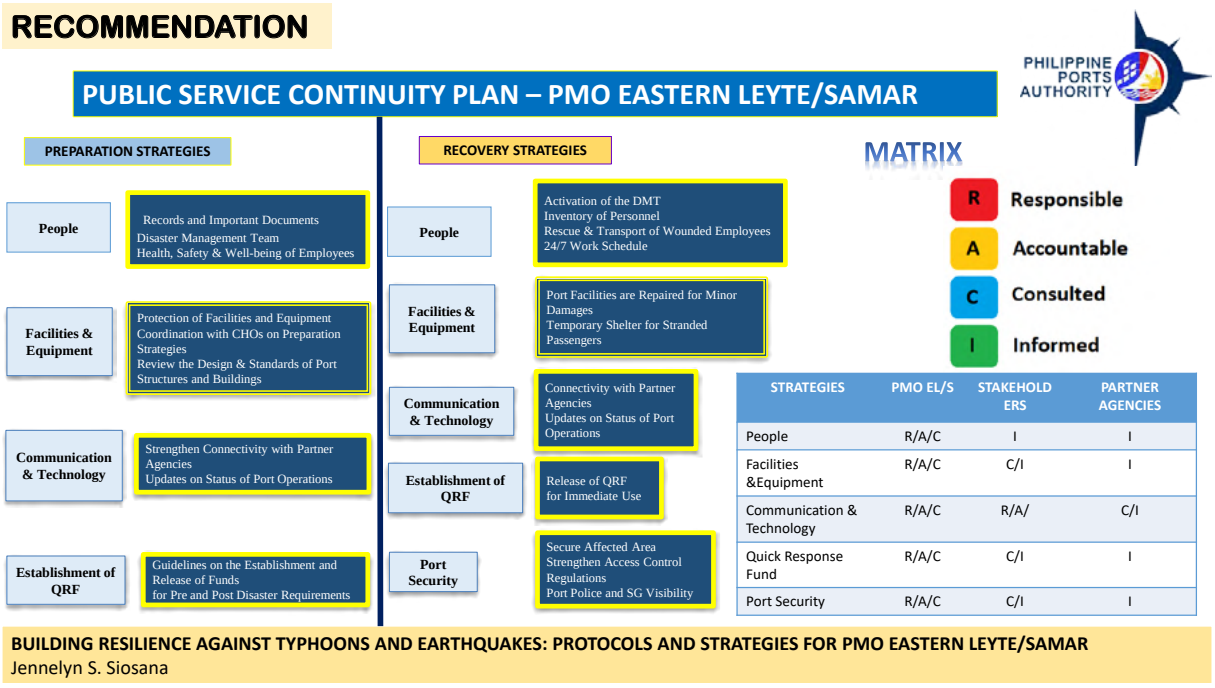
Recommendations

The principal recommendation emerging from this research is the development and implementation of a PSCP for PMO EL/S, specifically addressing the risks posed by typhoons and earthquakes. This plan aims to ensure the continuous delivery of essential PPA functions during and after severe weather events and other natural disasters that disrupt port operations.

Figure III.27 below illustrates the actions required to mitigate the risks posed by severe climatic conditions.

Because ports are composed of multiple interlinked systems, there is often overlap and redundancy in operations. All of these components must be considered when assessing port resilience

Figure III.27
Public Service Continuity Plan – Port Management Office Eastern Leyte/ Samar



Source: Author

Embedded in the PSCP are the following actions:

- **Develop a typhoon and earthquake-specific contingency plan:** This contingency plan should serve as a detailed guide for PMO EL/S in responding to and recovering from natural disasters. It must consider the needs and requirements of all relevant stakeholders—both during and immediately after a calamity—and should be developed through a collaborative and coordinated process. Active participation from various supply chain actors and port users is essential to ensure that all operational interests are considered and managed effectively.
- **Adopt the RACI Matrix framework:** The RACI (Responsible, Accountable, Consulted, Informed) Matrix should be used to clearly define roles and responsibilities across all stakeholders. This will help eliminate overlapping duties and prevent the neglect of critical tasks or functions during emergency situations.
  - The Matrix should include the following components: introduction; objectives; policy statement; scope; roles and responsibilities; assumptions; mission essential function, preparation and recovery strategies; activation criteria, procedures and authority; general procedures/protocols during typhoons; general procedures/protocols during earthquakes; closeout meeting; impact analysis; resource requirements; testing and maintenance.

Figure III.28
Components to the Preparedness and Recovery Strategies

Components	Preparedness Strategies	Recovery Strategies
People	• Preservation of records and important documents • Establishment and training of disaster management team • Ensuring the health, safety and well-being of employees	• Activation of the PMO EL/S Disaster Management Team • Inventory of personnel • Rescue and transport of wounded employees and stakeholders to medical facilities • Ensure continuity of port operations 24/7
Facilities and equipment	• Construction of temporary facilities for stranded passengers • Facilities and equipment are well-protected and ready for use after the calamity • Coordinate with port terminal management operators and cargo handling operators on disaster preparation • Review the design and standards of port structures and buildings	• Repair of damaged port facilities • Ensure the structural safety of port facilities • Conduct periodic inspections of port facilities
Communication and technology	• Maintain connectivity with partner agencies for necessary advisory • Provision of real-time information and updates on preparatory activities	• Enhance connectivity with partner agencies for necessary advisory • Provision of real-time information and updates on the status of port operations
Quick-response fund	• Preparation of guidelines on the establishment and release of funds for pre and post disaster requirements	• Prompt release of funds for post disaster requirements
Port security	• Prepare composition of port security personnel	• Secure affected area(s) • Clear area(s) from obstruction • Provide security to employees and stakeholders

Source: Author

Conclusion

This study underscored the urgent need for disaster preparedness and resilience at the PMO EL/S, which is situated in a region highly vulnerable to typhoons and earthquakes. Through an analysis of threats, stakeholder preparedness, and infrastructure capabilities, the study identified critical gaps in disaster response and recovery protocols.

To address these challenges, the development of a PSCP tailored to the specific hazards faced by PMO EL/S is proposed. This plan aims to ensure the uninterrupted delivery of essential port services before, during, and after natural disasters. The proposed PSCP outlines strategic measures, coordination protocols, and clearly defined roles to enhance the port's resilience and recovery capacity.

Impact and Implementation

The main recommendation of this dissertation—the development of a PSCP for PMO EL/S—has already made progress toward implementation. Recognising the timeliness and relevance of the proposal, especially given the region's exposure to strong typhoons and seismic activity, PMO EL/S initiated internal consultations to move the plan forward.

In the latter part of 2024, the draft PSCP was circulated to various responsibility centres within the PMO to gather comments, feedback, and insights. This collaborative step ensures that the perspectives of all relevant stakeholders are considered in the finalisation of the plan. Once internal feedback is consolidated, the PSCP will be transmitted to the PPA Head Office for formal review, approval, and eventual implementation.

The anticipated impact of the PSCP includes improved disaster response coordination, clearer communication protocols, and a more resilient port system capable of maintaining critical functions during emergencies. If fully adopted, the PSCP has the potential to serve as a model for other ports in similarly high-risk areas across the Philippines.

Sustainable Development Goals

This study advances Goal 9, industry, innovation and infrastructure, by promoting resilient design standards and continuity solutions for critical port infrastructure. Upgraded facilities, identifying redundancy in key systems, and technology coordination enhance reliability and keep trade moving during and after disasters. Adopting disaster-ready strategies improves operational continuity and supports long-term sustainable development of buildings and equipment.

The study also supports Goal 11, sustainable cities and communities, by ensuring ports—vital lifelines for mobility, supplies, and humanitarian aid—can maintain essential services, provide safe shelter and passage for passengers, and enable orderly, inclusive evacuation and relief operations. Enhancing resilience planning and emergency response capacity ensures safer, more sustainable port operations in disaster-prone areas and supports community stability.

(O) Passenger Terminal Operations at the Port of Batangas: An Assessment

Mr. Genesis Arn A. Bool (author), Division Manager A, Administrative Division, Philippine Ports Authority Port Management Office Marinduque/Quezon

Mr. Joselito O. Sinocruz (mentor), Port Manager, Philippine Ports Authority

Author biography

Genesis Arn A. Bool is a seasoned public servant and port professional with over 17 years of experience in port operations, administration, and human resource management. Currently serving as Division Manager of the Administrative Division at the PPA – PMO Marinduque/Quezon, Lucena City, Philippines. He has been with the PPA for 9 years, bringing a wealth of operational insight and leadership to his role.

His port career began in 2007 and spans various key positions, including Paymaster/ Administrative Assistant under the PPA Lucena Port Services - Special Takeover Unit, Administrative and Safety Officer with a cargo handling firm, and several roles within the PPA such as Business Development and Marketing Assistant, Harbor Operations Assistant, Harbor Operations Officer, and Port Operations Specialist. These roles have equipped him with a well-rounded understanding of both frontline port operations and internal administrative functions. In his current capacity, Mr. Bool leads initiatives in human resources, general services, records management, procurement, property and supply management, and compliance with government mandates and policies.

Beyond his core responsibilities, he has contributed to several major committees, including procurement, safety, and anti-red tape initiatives, reflecting his strong commitment to public service, continuous improvement, and organisational excellence.

> *The leadership and project management skills acquired from the Programme have empowered me to lead larger teams and manage complex projects with greater confidence and effectiveness.*

Introduction

The Port of Batangas is a major hub port in the PPA port system, facilitating waterborne commerce for both international and domestic trade. It plays a crucial role in promoting development, primarily in the

Calabarzon region, as well as the Visayas and Mindanao regions. Additionally, the port serves as a significant gateway for inter-island passenger traffic between mainland Luzon and destinations such as Mindoro, Romblon, and the island provinces of the Visayas. From 2017 to 2019, prior to the COVID-19 pandemic, Batangas Port recorded an average of nearly seven million passengers on various routes.

Although the pandemic had a significant impact on passenger movement in 2020 and 2021, the port terminal continued its operations to address passenger requirements. The terminal provided modern passenger terminal facilities to address the needs and challenges faced by port users. By October 2022, the Port of Batangas had accommodated 3.4 million passengers, with expectations of further passenger growth as peak season approached, specifically in December for the Christmas and New Year period.

While a modern PTB is constructed by the Port Terminal operator as part of their contractual commitment with the PPA, there still remain issues related to passenger handling that need attention.

The study aims to achieve several objectives, including assessing the flow and movement of passengers within the port premises, gathering feedback from passengers regarding the port's current facilities, identifying sources and the nature of passenger concerns and complaints, and engaging the terminal operator in revising their development commitments to encompass comprehensive passenger terminal operations. It is crucial for the PPA PMO in Batangas to establish guidelines and procedures for passenger handling to be implemented and delivered by ATI Batangas Inc., the responsible entity. The research works to identify and address the relevant issues to ensure comfort and convenience to passengers throughout their journey, from entering the port and navigating the modern terminal building to boarding scheduled vessels.

Aerial view of Batangas Passenger Terminal

Source: Author

Analysis

The Batangas Passenger Terminal is situated in the southern portion of the Port of Batangas. To access the port, walk-in passengers use an access gate locally known as the "Yellow Gate". From the entrance hub, passengers proceed to the Batangas Passenger Terminal by walking approximately 50 meters through makeshift tents that serve as a covered walkway.

Temporary covered walkway for passengers

Source: Author

While the tents provide temporary shade from sunlight and cover during rainfall, these structures remain susceptible to damage during severe storms. Consequently, the Terminal Operator dismantles the tents during typhoons, leaving passengers exposed to sunlight or rain during these times.

Old walkways no longer in use, Port of Batangas

Source: Author

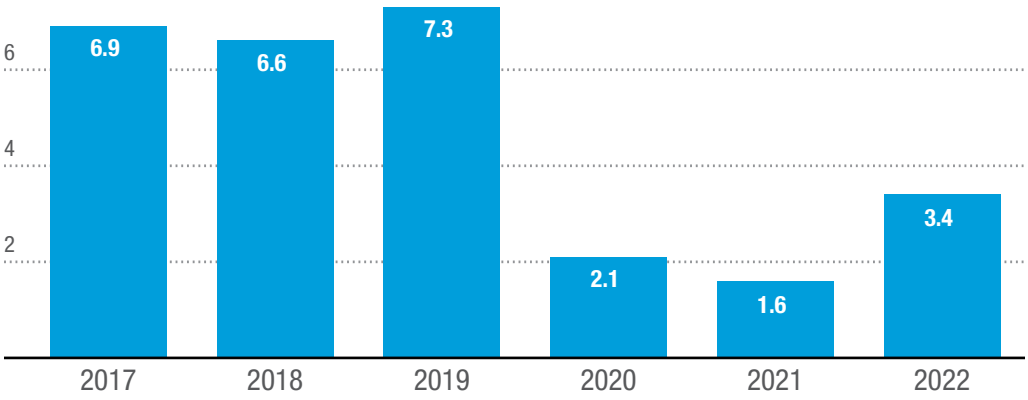
Upon entering the newly constructed Batangas Passenger Terminal, passengers encounter walk-through detectors, baggage X-ray machines, and thermal scanners. From there passengers proceed to the shipping line counters to purchase tickets and then to the Terminal Fee counters before entering the main passenger lounge. The new Batangas Passenger Terminal offers various shops and stalls for passengers while waiting for their trips. Upon entry into the terminal, passengers enjoy a fully air-conditioned facility that provides comfort and convenience.

New Batangas Passenger Terminal

Source: Author

As shown in Figure III.29, the historical data on passenger traffic from 2017 to October 2022 at the Port of Batangas reveals the impact of the COVID-19 pandemic on passenger movement. As pandemic related restrictions eased towards the end of 2021 and first half of 2022, passenger traffic began to recover, reaching 3.4 million passengers by October 2022. This upward trend is expected to continue, especially during peak holiday seasons.

Figure III.29
Total passenger traffic (in millions)



Source: Authors graph using data from Port Management Office Batangas passenger statistics

Passenger concerns received for the years 2021 and 2022 revealed the areas that require attention and improvement. In 2021, the most common complaints included chaotic queuing or congestion at the Batangas Port, delayed S-PaSS approval, inconvenience at the port, alleged irregularities in PPA, and priority on perishable goods. In 2022, the major complaints revolved around travel insurance, limited trips, scanning S-PaSS, inter-agency task force guidelines, and traffic of vehicles during holiday rush. These findings emphasize the importance of addressing congestion issues, streamlining administrative processes, and ensuring compliance with regulations to enhance the overall passenger experience.

While the 2022 surveyed satisfaction was strong, there remains a need for the construction of a modern PTB at the Port of Batangas. Presently, the project phase 1 has been completed and is now operational, there are still some facilities, amenities, and equipment that have not been fully delivered or included in the planning. These include the development or improvement of the Passenger Entrance Hub (Yellow Gate) and the provision of covered walkways for pedestrian passengers. Additionally, this study identified specific facilities, amenities, and equipment required for a modern PTB, such as comfort rooms, passenger lounges, generator sets, video monitoring systems, and emergency exits. Addressing these deficiencies and implementing the proposed facilities, amenities, and equipment would contribute to enhancing the overall passenger terminal operations.

Inputs were collected from counterparts at other PMOs with similar passenger terminal operation setups such as implementing a "No Vessel Ticket No Entry" policy to regulate access to the port premises and ensuring passengers have appropriate tickets before entry.

Recommendations

Based on the analysis, the following recommendations are proposed to address identified challenges and enhance the effectiveness of operations at the Batangas Passenger Terminal:

1. The Terminal Operator should complete the construction of the Batangas Passenger Terminal to accommodate the increasing passenger traffic.
2. Port Management should maintain reliable and satisfactory services and monitor the Terminal Operator's compliance with regulations.
3. Improve the Yellow Gate Passenger Access Hub by installing covered walkways, deploying additional shuttles, and utilising digital platforms for easier ticketing processes.
4. Inform the public that additional travel insurance is not required to enter the port and implement measures to prevent unscrupulous individuals.
5. Consider relocating the ticketing office to a strategic location within the port and establishing a common ticketing area for passengers before entering.
6. Encourage the Terminal Operator and shipping lines to adopt digital platforms for issuing vessel tickets and passenger terminal tickets online.

Port of Batangas, New Passenger Pedestrian Gate

Source: Author

Port of Batangas, New Batangas Passenger Terminal

Source: Author

Conclusion

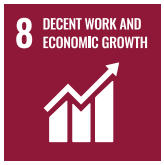
In supporting inter-island mobility and economic activity in Southern Luzon and beyond, this study worked to highlight the critical role of the Batangas Passenger Terminal. Despite the significant improvements brought by the newly constructed terminal, challenges persist, particularly in passenger access, amenities, and congestion during peak seasons. Through comprehensive analysis and stakeholder feedback, the study identified actionable areas for enhancing operational efficiency and passenger experience. Addressing infrastructure gaps, improving digital ticketing processes, and reinforcing regulatory compliance are essential to meet growing passenger demand and ensuring more seamless and secure journeys overall. Implementing these recommendations will not only elevate service delivery at the Batangas Passenger Terminal but also strengthen its position as a key transport hub in the Philippine port system.

Impact and Implementation

Since this case study was presented to the Philippine Ports Authority headquarters, the following steps have been taken towards bettering services offered to passengers travelling through the Port of Batangas:

1. A new passenger pedestrian gate and permanent covered walkway replacing the temporary structures was completed and opened on 30 October 2024.
2. The Batangas Port Terminal was completed in April 2024.
3. An online booking option for passengers is now available with three of the shipping lines calling in the Port of Batangas. One company also offers the use of an e-ticket kiosk inside the passenger terminal. In 2025, PPA plans to launch and implement the integrated electronic ticketing system for all passengers.

Sustainable Development Goals



By accommodating more travellers, the terminal fosters growth in related sectors such as tourism, logistics, and transportation services. The actions covered in this study boost economic activity and creating jobs in the region, directly working towards Goal 8, decent work and economic growth. Improving terminal capacity can significantly increase passenger traffic which in turn benefits local businesses, tourism, and trade, ultimately enhancing economic output. The construction and operation of the terminal will create job opportunities for residents in the city and surrounding areas both during the construction phase and in long-term maintenance roles.

The project in this study plays a vital role in developing resilient and sustainable infrastructure, key aspects of Goal 9, industry, innovation and infrastructure. A modern terminal is more durable and increases passenger capacity. Incorporating advanced technologies and innovative designs during construction can enhance operational efficiency, safety, and the overall passenger experience. Using sustainable materials and energy-efficient systems reduces environmental impact and supports sustainability in infrastructure projects. The completion of the Batangas Passenger also promotes innovation within the transportation sector. Features like digital ticketing systems, real-time tracking, and automated services align with Goal 9's focus on promoting innovation.

The study advances Goal 11, sustainable cities and communities, by providing modern, accessible, and well-equipped passenger terminal facilities. Improved inter-island connectivity in Southern Luzon and beyond supports community mobility, strengthens social inclusion, equitable economic opportunities and ensures that transportation systems are safe, reliable, and sustainable for both urban and rural populations.

Port of Dar es Salaam

Tanzania Ports Authority

The Tanzania Ports Authority (TPA), established under the Port Act CAP 166 of 2004, is mandated to oversee the effective Management and operations of both sea and inland waterways ports. This includes overseeing cargo handling, passenger services, port infrastructure and superstructure development, safety and security.

Strategically positioned along a 1,400-kilometer stretch of the Indian Ocean coastline, seaports play a central role in the economic integration and transformation of East, Central, and Southern Africa. Tanzanian ports serve not only Tanzania but also land-linked nations including Burundi, the Democratic Republic of Congo, Malawi, Rwanda, South Sudan, Uganda, Zambia and Zimbabwe—together representing a market of over 300 million people.

TPA oversees a diverse port network on the Tanzanian mainland. Major seaports include Dar es Salaam, Tanga, and Mtwara. Under the leadership of President Dr. Samia Suluhu Hassan, port modernisation has become a national priority, aiming to position Tanzania as a leading regional logistics hub. In 2024, operational management of some port functions transitioned to Public-Private Partnerships. Notably, DP World and Tanzania East Africa Gateway Terminal Limited began operating berth of the Dar es Salaam Port.

TPA continues to make substantial investments in infrastructure to meet rising demand and improve service delivery. At Dar es Salaam Port, the addition of berths 12–15 is expected to increase cargo handling capacity. A new petroleum handling facility is under development to strengthen the region's energy logistics. Moreover, the Conventional Buoy Mooring and Single Receiving Terminal Project in Kigamboni, Dar es Salaam, is expected to reduce petroleum offloading times, improve revenue collection, and boost operational efficiency.

Other key developments include transforming Tanga Port through investments exceeding 429 billion TZS. Upgrades involve expanded berthing space and a newly constructed fuel jetty. Progress is also underway at Mtwara Port

Tonnes of trade
32 600 000

TEUs
1 260 000

and the newly established Mbamba Bay Port in Ruvuma Region, aimed at enhancing trade along the southern corridor and facilitating exports and imports between Tanzania, Malawi, eastern Zambia, and northern Mozambique. The infrastructure improvements have also aligned with Tanzania's national development vision, which seeks to grow the transport sector's Gross Domestic Product (GDP) contribution from 7% to 15%. Developing partnerships with global shipping lines complements these efforts, enabling Tanzanian ports to expand their international reach.

The iconic transformative project that has been successfully implemented is the Dar es Salaam Maritime Gateway Project. At a cost of 421 million United States dollars, the project had delivered deeper, strengthened berths, widened entrance channels, and improved rail connectivity, allowing the port to handle larger, more modern vessels and cargo volumes. In turn, TPA has started reaping the benefits through improved efficiency, technology, logistics enhancement, and operational optimisation.

Additionally, the deployment of the Tanzania Electronic Single Window System has revolutionized customs and trade facilitation processes. This digital system ensures faster, transparent cargo clearance, reducing dwell times and boosting government revenue collection through improved compliance.

These developments have elevated Tanzania's profile as a competitive international trade hub and a catalyst for regional economic integration.

© Tanzania Ports Authority

TPA has greatly benefited from UNCTAD TrainForTrade Programme, particularly its Port Management Training component. Since 2008, this initiative has been instrumental in building the capacity of TPA staff and port stakeholders, thereby enhancing the operational efficiency and performance of our ports.

Over 130 TPA employees and associated stakeholders have participated in various training opportunities offered by UNCTAD. These include comprehensive long-term courses that lead to the Port Management Certificate, Training of Trainers (ToT) programmes, and a suite of flexible online learning options. Each modality is carefully designed to deepen expertise in port operations, logistics management, and the broader maritime sector.

The Port Management Certificate programme in particular, has provided our workforce with advanced knowledge and managerial tools required to operate modern ports effectively. It has empowered staff to adapt to the complexities of global trade and raised operational standards across our network.

The ToT initiative has cultivated a cadre of skilled internal trainers, creating a sustainable mechanism for knowledge transfer within the organisation. These trainers have not only become agents of change within TPA but have also gained global insights by engaging with best practices from leading ports around the world.

UNCTAD's online learning offerings have added a vital layer of accessibility and continuity to our training ecosystem. By enabling staff to learn without leaving their posts, even during periods of restricted physical interaction, TPA has maintained its commitment to professional development without compromise.

The ongoing engagement of TPA with the UNCTAD Port Management Programme underscores our dedication to human capital development as a cornerstone of institutional success. We firmly believe that a competent and empowered workforce is essential to realizing Tanzania's vision of becoming a premier regional trade and logistics centre.

The impact of the TrainForTrade Programme is evident, not only in enhanced individual capabilities, but also in institutional transformation. Our ports are now more efficient, our services more responsive, and our stakeholder engagement more robust. These gains are reflected in increased productivity, higher customer satisfaction, and growing recognition of Tanzanian ports at the regional and international levels.

As we look ahead, TPA remains committed to strengthening its collaboration with UNCTAD and to investing in the continuous development of our people, who remain our most valuable asset in driving sustainable growth and operational excellence.

Mr. Plasduce Mkeli Mbossa, Director General

Chapter IV

Sustainable Strategy

The United Nations remains steadfast in its commitment to the 2030 Agenda, under which Member States adopted SDGs. The port reforms recommended in the case studies of the TrainForTrade Port Management Programme are closely aligned with the SDGs, whether addressing environmental impact, driving social change, or enhancing economic integration. This section presents an overview of the SDGs and highlights their relevance to the Port Management Programme.

The United Nations Sustainable Development Goals

In 2015, all United Nations Member States came together to adopt the landmark 2030 Agenda for Sustainable Development. This Agenda, a promise to work together towards long-term peace and prosperity for all, is framed by the 17 SDGs. From poverty to climate change, the SDGs seek to work in a targeted and cohesive manner to bring together key actors of government, business, civil society and individuals to achieve these goals. Structured into 17 goals, 169 targets and utilising 234 unique indicators, the United Nations and its members employ the SDGs as a common language and blueprint for global development. Achieving the SDGs requires a shared commitment and lasting partnerships to create enduring, positive change.

We know sustainable peace requires sustainable development. The Sustainable Development Goals are not a dream. They are a plan. A plan to keep our promises — to the most vulnerable people, to each other, and to future generations. People win when we channel our energy into development.

Mr. Antonio Guterres
Secretary General of the United Nations, 2025

Proactive Role of UNCTAD in Achieving the Sustainable Development Goals

UNCTAD is committed to contributing to the achievement of the SDGs. UNCTAD SDG Pulse,[3] an annual statistics publication tracking SDG accomplishments, stands as proof of this promise. Moreover, UNCTAD's mandate, which is broadly aligned with trade, development, investment, finance and technology, has UNCTAD assigned as custodian looking after specific SDG indicators; notably indicators as part of Goal 1 (no poverty), Goal 9 (industry, innovation and infrastructure), Goal 10 (reduce inequality), Goal 12 (responsible consumption and production), Goal 16 (peace, justice and strong institutions) and Goal 17 (partnerships for the Goals).

TrainForTrade is equally dedicated to creating impactful and positive contributions in working towards the SDGs. In 2023, volume 11 of the Port Management Series was published in English, French and Spanish as a special edition focused solely

[3] https://sdgpulse.unctad.org/

on port performance indicators and their links to the SDGs. By linking each indicator to relevant Goals, PMS volume 11 highlights practical port activities that directly support achieving the 17 SDGs. PMS volume 11 also showcased the TrainForTrade Port Performance Scorecard (PPS). The PPS provides port industry stakeholders a reliable set of statistical indicators for benchmarking purposes, where industry players may be aligned and have a basis for sustainable decision making. With 6 categories[4] covering 26 indicators, the PPS offers a set coherent figures for port managers to establish a basis for comparison, either against regional averages or with themselves over a time series. The PPS and PMS volume 11 work to strengthen the port sector's capacity to contribute effectively to the 2030 Agenda.

As essential enablers of global trade ports play a pivotal role. Many of the papers in this PMS volume 14 illustrate the importance and commitment of port managers to advancing the SDGs through conscious and collaborative port activities. The partnerships between port partners and ports in developing countries form a powerful alliance that supports UNCTAD mission to contribute meaningfully to achieving key objectives and prosperity for all. The fifteen case studies covered in this PMS volume 14 relate port managers' ideas directly to the SDGs. As is seen in many cases, some ports have already taken action or plan to take action towards the implementation of the proposed port changes. The PMP is proud to see participant ideas directly linked to supporting the UN SDGs, driving meaningful impact from within.

The SDGs referenced in the case studies of this publication are as follows (number of occurrences in parentheses):

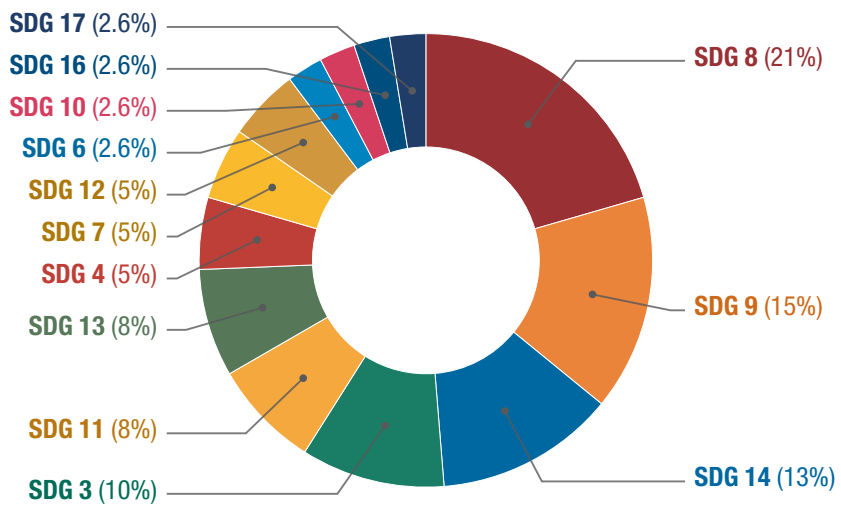
- **Goal 3: Good health and well-being**
  Ensure healthy lives and promote well-being for all at all ages. (4)
- **Goal 4: Quality education**
  Ensure inclusive and equitable education and promote lifelong learning opportunities for all. (2)
- **Goal 6: Clean water and sanitation**
  Ensure availability and sustainable management of water and sanitation for all. (1)

[4] The 6 categories being: finance, human resources, gender, vessel operations, cargo operations, and environment.

- Goal 7: **Affordable and clean energy**
  Ensure access to affordable, reliable, sustainable and modern energy for all. (2)
- Goal 8: **Decent work and economic growth**
  Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all. (8)
- Goal 9: **Industry, innovation and infrastructure**
  Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation. (6)
- Goal 10: **Reduced inequalities**
  Reduce inequality within and among countries. (1)
- Goal 11: **Sustainable cities and communities**
  Make cities and human settlements inclusive, safe, resilient and sustainable. (3)
- Goal 12: **Responsible consumption and production**
  Ensure sustainable consumption and production patterns. (2)
- Goal 13: **Climate action**
  Take urgent action to combat climate change and its impacts. (3)
- Goal 14: **Life below water**
  Conserve and sustainably use the oceans, seas and marine resources for sustainable development. (5)
- Goal 16: **Peace, justice and strong institutions**
  Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels. (1)
- Goal 17: **Partnerships for the Goals**
  Strengthen the means of implementation and revitalise the global partnership for sustainable development. (1)

As major sources of revenue stream and employment, ports naturally contribute more to some SDGs over others, notably Goals 8 and 9 which target economic activities. Nonetheless, ports still play an important role in contributing to all 17 SDGs. This can be seen in this PMS volume 14 with case studies tackling climate related initiatives under Goals 13 and 14, case studies encouraging sustainable practices via Goals 6, 7, 11 and 12, as well as initiatives looking after the wellbeing of port employees, Goals 3, 4 and 10.

Figure IV.1
Appearance of Sustainable Development Goals in Port Management Series volume 14 by percentage



Source: TrainForTrade

TrainForTrade directly encourages the support of the UN SDGs whenever possible. Module 4 of the course on Modern Port Management, *Challenges of Sustainable Ports*, includes a focus on the SDGs. Port Management Programme participants are also encouraged to include a section in their case studies linking proposed improvements in their ports to the Goals.

Port Endeavor: a game to make you think outside-the-box

February 2025, a session of *Port Endeavor* in Malé, Maldives

Port Endeavor is a business game designed for port managers to test their management skills related to the SDGs in a fun and engaging way. Conceived in 2019, the project is the result of a collaboration between UNCTAD, IAPH, and the Port of Antwerp-Bruges/APEC. This business game places participants in situations drawn from real cases recorded by IAPH as part of its World Ports Sustainability Program (WPSP). The benefits are numerous: raising managers' awareness of the importance of the SDGs, introducing them to alternative solutions to address certain challenges, and fostering reflection and exchange between executives from different ports who sometimes face the same issues.

Today, the game exists in three languages (English, French and Spanish) and is played in a hybrid format, where the game cards automatically appear on players' devices, allowing each participant to read the challenges and potential solutions at their own pace.

Port Endeavor has empowered port professionals to become SDG ambassadors. In 2023, the Port Endeavor game was shortlisted as a finalist for the UN Secretary-General Awards in the "UN 2.0 – Quintet of Change" category, recognising innovative UN team efforts that generate lasting impact. This nomination provided TrainForTrade the opportunity to showcase the Port Endeavor game to thousands of colleagues across the UN system.

UN SECRETARY-GENERAL AWARDS

> Through concrete cases, Port Endeavor demonstrates the value of placing the SDGs at the heart of port management

A lasting partnership with the International Association of Ports and Harbors

In November 1955, some 100 world port leaders gathered in Los Angeles to announce the creation of IAPH following an initial meeting of founding ports three years earlier in Kobe, Japan. Now celebrating its seventieth anniversary, IAPH has developed into a global alliance of 191 port authorities as well as 168 port-related businesses.

Comprised of over 80 different nationalities across the world's continents, member ports handle over one third of the world's sea-borne trade and well over 60% of the world container traffic.

IAPH aims to be the global trade association of choice for port authorities and operators, representing their interests at the regulatory level thanks to its UN consultative status at the IMO. IAPH has a permanent liaison stationed close the IMO headquarters in London and regularly presents policy submissions and information papers alongside NGOs and member states at the IMO Marine Environment Protection, Trade Facilitation and Maritime Security committees and their relevant working groups.

IAPH leads global port industry initiatives on decarbonisation and energy transition through its Climate and Energy technical committee. IAPH owns the Environmental Ship Index, which is a voluntary environmental ship index designed and used by over 75 port authorities and maritime administrations globally to incentivise ship owners, operators and managers to improve the environmental performance of some 6,000 cargo and passenger vessels, including half the world's container carrier fleet.

IAPH is also focused on improving port resilience, with a dedicated Risk and Resilience Committee that has developed guidelines for ports to inventory risk, prepare crisis management interactions with key public and private stakeholders and to establish a process which manages the organisational response before during and after an incident. IAPH also organises the annual World Ports Conference, which brings together senior port leaders from around the world with their counterparts in shipping, supply chain management, technology and materials handling and which also celebrates the winners of the IAPH Sustainability Awards of its World Ports Sustainability Program.

Mr. Patrick Verhoeven, Managing Director, IAPH

International Association of Ports and Harbors and TrainForTrade

IAPH has a decades-long partnership with UNCTAD, focusing on enhancing port performance, sustainability, and the integration of the UN SDGs into port operations.

The first collaboration goes back to 1998, when UNCTAD and IAPH first initiated a partnership aimed at improving port

efficiency in developing countries. This collaboration focused on developing and implementing information systems tailored to the specific needs of ports in these regions, thereby reducing the technological gap with more advanced countries and providing adapted systems at acceptable costs.

In 2018, IAPH founded its WPSP, which aims at demonstrating global leadership of ports in contributing to the SDGs. The Program empowers port community actors worldwide to engage with business, governmental and societal stakeholders in creating sustainable added value for their local communities and wider regions in which their ports are embedded.

In early 2019, to properly structure the WPSP, UNCTAD and IAPH co-hosted a cross-industry workshop with academia at UN headquarters in Geneva to identify priorities assigned by ports concerning the 17 UN SDGs. The outcomes of this workshop led to the development of the "Port Endeavor" game, a tool designed to raise awareness among port managers about integrating SDGs into port operations. The game simulates real-life scenarios using content of actual projects from the 401– strong database of best practices from 161 ports from 65 different countries of the WPSP. Participants join imaginary port teams are tasked with taking decisions jointly on how to achieve sustainability goals with limitations on budget and confronted with real life events which impact their operations.

This aim to foster a deeper understanding of sustainable practices in port management goes well beyond the 1,600-plus port executives who have already experienced the games' phenomenal global success. The Port Endeavor gameplays devised and coordinated by TrainForTrade and IAPH together with development partner APEC have now been played by government, NGOs, IGOs, academic institutions and more importantly by the cargo owners and societal stakeholders whom both port authorities and port operators serve.

TrainForTrade, APEC and International Association of Ports and Harbors annual Port Endeavor meeting, Geneva, 2023

From left, Mr. Tomasz Kulaga, Mr. Gonzalo Ayala and Mr. Mark Assaf of TrainForTrade, Ms. Rhona Macdonald and Mr. Antonis Michail of IAPH, Ms. Johanna Bruehlmann and Mr. Dominique Chantrel of TrainForTrade, Ms. Carolien De Vries and Mr. Joachim Verheyen of APEC. Behind the camera Mr. Victor Shieh from International Association of Ports and Harbors.

World Ports Sustainability Program

Each year IAPH holds its annual World Ports Conference, a premier global gathering of port professionals, industry leaders, and stakeholders. The conference provides a platform to discuss innovations, sustainability, and best practices, fostering collaboration to address challenges facing ports worldwide. A much-celebrated aspect of this conference is the prizegiving for the winners of the WPSP.

The WPSP is a global initiative supporting the implementation of sustainable practices in ports aligned with the SDGs. Each year participating ports submit projects covering six categories – digitalisation, infrastructure, health safety and security, environmental care, community building, and climate and energy – as part of the sustainability awards. Projects are evaluated by a panel of experts, of which TrainForTrade's Chief, Mark Assaf, is jury member. Finalists are then presented to the public for further voting. The cases from the WPSP database are used to create the game-cards for the Port Endeavor Game. With new sustainability projects submitted each year, the pool of game cards is also proactively replenished, ensuring the lasting durability of the game.

World Ports Sustainability Program Sustainability Awards, 2024

© IAPH

Winners collecting their prizes on stage alongside expert juries at the 2024 World Ports Conference in Hamburg

South-South Cooperation for the Goals

South-South cooperation is essential for the success and sustainability of TrainForTrade's Port Management Programme. The Programme's innovation lies in its regionally driven, internationally supported model. UNCTAD and global experts provide oversight and methodological support, while regional trainers and port experts lead delivery from the communities themselves, bringing practical knowledge and local context. The result is a blended learning ecosystem that is high in both quality and relevance.

The goal is not only to build capacity but also to ensure that expertise is retained and disseminated within the region, reducing dependence on external actors. What makes this initiative unique is its peer-led model: trainers from one country are invited to teach in another, while port professionals across the network regularly act as jury members for the final stage of the training – the dissertation defence.

Sustainability is embedded in the structure. Trainers often remain in leadership roles at their home ports long after certification. National committees institutionalise the programme, and regional exchanges strengthen networks. Some countries have even integrated the programme into their national port training and human resources strategies.

Peer evaluation builds relevance. Financial contribution fosters ownership. And trust, built over time, becomes the foundation for South-South cooperation that is resilient and adaptable. The result is a sustainable model of South-South cooperation where capacity is both transferred and deeply rooted within port communities, driven by a vision of port development from the South, for the South.

South-South Galaxy, a UN Global Knowledge Sharing and Partnership Brokerage Platform, aims to serve as a connector, bringing together innovators, policymakers and practitioners all in one place. The Port Management Programme is part of South-South Galaxy's interactive database, allowing for further integration opportunities between TrainForTrade and other like-minded initiatives.[5]

TrainForTrade takes pride in providing a platform for lasting exchanges both within port communities as well as across borders, acknowledging the how essential it is that meaningful, constant exchanges occur to bring about innovative and sustainable change.

[5] https://southsouth-galaxy.org/solutions/detail/Port-Management-Programme-PMP/

Chapter V

Conclusion

The Port Management Programme and its vibrant global network have proven to be powerful catalysts for collaboration, innovation, and sustainable development in the port sector. By fostering strong professional ties, knowledge sharing, and building capacity, the network continues to strengthen ports' ability to meet global challenges and seize new opportunities.

The UNCTAD Port Management Programme unites port professionals from across the globe in a spirit of collaboration and knowledge sharing. This 14th edition of the UNCTAD TrainForTrade Port Management Series showcases fifteen outstanding dissertations researched, written, and presented by port professionals from port communities of Africa and Asia of the English-speaking network. As pivotal enablers of international trade, ports play a vital role in advancing sustainable development, and the works featured in this volume highlight port managers' dedication to integrating SDG targets and indicators into their daily operations.

The professional—and often friendly—connections formed through the network provide mutual support that transcends borders. Experience and continuity are guarantees of quality. Messages from the directors general of various ports to the community bear witness to this. TrainForTrade has continuously adapted to the needs of its members and emerging challenges, steadily improving its methods and content. Going forward, this expertise will continue to support the durability of the network.

As a leading example of South–South and triangular cooperation, the Port Management Programme aims to inspire generations of leaders and managers to build a more sustainable and united world. The network of sponsoring ports in Ireland, working hand-in-hand with ports in developing countries, forms a powerful alliance that advances UNCTAD mission to contribute to the achievement of the 2030 Agenda.

TrainForTrade would like to extend warm thanks to its network members and the inspiring people of their port communities. Our heartfelt gratitude goes to Irish Aid and port partners for its unwavering support and dedication to the network.

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