UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT

UNCTAD

PORT MANAGEMENT SERIES

2020

Volume 8

Case Studies

TrainForTrade
Port Management
Programme
English-speaking Network

SUSTAINABLE DEVELOPMENT GOALS

UNITED NATIONS

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NOTE

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The summaries of the featured dissertations and participants' career profiles were prepared by John Moore, Janjarang Kijtikhun, Dominique Chantrel, Tomasz Kulaga, Amélie Cournoyer under the supervision of Mark Assaf, Chief of the Human Resources Development Section-TrainForTrade, UNCTAD, and the overall guidance of Geneviève Féraud, Head of the Knowledge Development Branch and Shamika Sirimanne, Director of the Division on Technology and Logistics, UNCTAD.

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LIST OF ACRONYMS AND ABBREVIATIONS

AIS	Automatic Identification System
BBT	Bulk and Break Bulk
CCTV	Closed Circuit Television
DPC	Dublin Port Company
GPHA	Ghana Ports and Harbours Authority
HGVs	Heavy Goods Vehicles
HSE	Health, Safety & Environment
IMO	International Maritime Organization
ISO	International Organization for Standardization
JPA	Johor Port Authority
JPB	Johor Port Berhad
KPIs	Key Performance Indicators
LME	London Metal Exchange
MARPOL	The International Convention for the Prevention of Pollution from Ships
MPM	Modern Port Management course
MNHPI	Manila Port Harbour Incorporated
NPA	Nigerian Ports Authority
PPA	Philippine Ports Authority
PPP	Private-public partnership
POAC	Person in Overall Advisory Control
PMP	Port Management Programme
PMS	Port Management Series
PWRFs	Port Waste Reception Facilities
SDGs	Sustainable Development Goals
SEC	State Enterprises Commission
SOE	State-owned entreprise
TFT	TrainForTrade
TOS	Terminal Operating System
TEUs	Twenty-foot equivalent units
UNCTAD	United Nations Conference on Trade and Development
VTS	Vessel Traffic Systems

INTRODUCTION

The role of UNCTAD

UNCTAD was established in 1964 as a permanent inter-governmental body and the principal organ of the United Nations General Assembly dealing with trade, investment and development issues. UNCTAD is the United Nations' focal point for least developed countries and assists them to integrate into the world economy on an equitable basis. Non-tariff barriers such as long waiting times at borders, inappropriate fees and burdensome rules and regulations as well as time-consuming administrative procedures all constitute obstacles to trade that can be more onerous than tariff barriers.

UNCTAD works with developing countries in identifying their trade and transport facilitation needs and provides technical assistance as well as workshops, seminars, webinars, e-learning and tailored training programmes, with the overall objective of increasing their capacity and thereby growing their economies in a sustainable way.

The role of ports in international trade

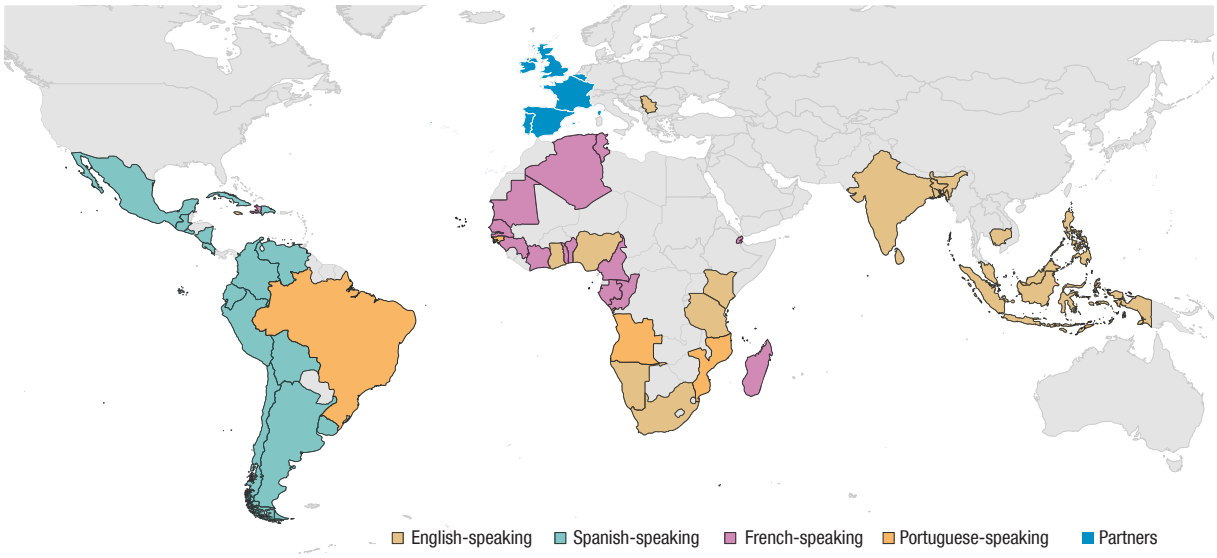
Maritime transport is essential to the world's economy as more than 80% of world merchandise trade is carried by sea. Sea transport ranks as the most cost-effective and least environmentally damaging mode of transport to move large volumes of goods and raw materials between countries. Maritime transport requires efficient ports to handle imports and exports. Port efficiency therefore has a direct impact on the relative capacity of countries to participate in international trade. It follows that ports serving developing countries must operate efficiently for them to integrate effectively into the world economy. UNCTAD plays an important role in this area through its Port Management Programme.

The Port Management Programme (PMP)

The role of the PMP

UNCTAD assists ports in developing countries by conducting research, carrying out technical assistance activities and providing training and capacity-building. The TrainForTrade Port Management Programme (PMP) strengthens talent management and human resources development in ports in developing countries in the following ways:

1. By setting up a sustainable capacity-building framework for training future managers working in ports, transport and logistics and related government entities.
2. By establishing port networks which bring together port experts from public and private entities around the world to share knowledge and expertise.
3. By creating a searchable database of original dissertations researched and case studies produced by port managers as the final part of their PMP certification.
4. By capitalizing on the extensive network of senior port managers from Africa, Asia, Europe, and Latin America and the Caribbean to create and promote an independent series of port performance indicators which has become not just a valuable source for researchers but which is also a tool used by ports to assist in strategy-making and master planning.



English-speaking	Spanish-speaking	French-speaking	Portuguese-speaking	Partners
Bangladesh	Argentina	Algeria	Angola	Belgium
Cambodia	Bolivia	Benin	Brazil	France
Ghana	Chile	Cameroon	Cabo Verde	Ireland
India	Colombia	Comoros	Guinea-Bissau	Portugal
Indonesia	Costa Rica	Congo	Mozambique	Spain
Jamaica	Cuba	Côte d'Ivoire	Sao Tome and Principe	United Kingdom
Kenya	Dominican Republic	Djibouti	Timor-Leste	
Malaysia	Ecuador	Gabon		
Maldives	El Salvador	Guinea		
Namibia	Guatemala	Haiti		
Nigeria	Mexico	Madagascar		
Philippines	Nicaragua	Mauritania		
Serbia	Peru	Senegal		
South Africa	Uruguay	Seychelles		
Sri Lanka		Togo		
United Republic of Tanzania		Tunisia		

Figure 1: TrainForTrade Port Management Programme global network of sixty countries

The structure of the PMP

The PMP is comprised of eight modules delivered over a period (cycle) of eighteen to twenty-four months covering all aspects of modern port management.

A key component of the PMP is the dissertation/business-focused-report which accounts for up to 50% of the total marks awarded to participants. The other 50% is accumulated from on-line examinations after each of the eight taught modules. The dissertation/case study process requires each participant to take a business management approach to researching, analysing and delivering a professional report.

The final dissertation/case study

The final dissertation/case study process begins early in module 1 when participants first select a senior manager with knowledge of their chosen subject who agrees to be their mentor. Their work is supervised by the mentor as they conduct research on a specific problem or opportunity in the port sector and propose implementable recommendations. Past results show that the involvement of senior port managers increases the likelihood that the conclusions and recommendations of the case study will be integrated into management strategies. The PMP has also found that bringing senior and middle managers together is essential for creating a culture within the port that fosters the transfer of knowledge. The dissertation process requires that the participants develop an implementation plan showing how they would put into practice what they have learned and allows them to contribute effectively to improving operations in their ports.

The final dissertations are shared among a panel of reviewers who assess the written document. The participants then have an opportunity to present their findings and defend their report before a three-person panel comprised of an independent chairperson appointed by UNCTAD, the participant's mentor and one other senior manager from the port or an external body.

The review panel evaluates the dissertations based on the following criteria:

- Clarity in explaining the central objective of the case study and the problem at hand or the opportunity arising for the business to exploit
- Relevance of the research and analysis to the business
- Overall quality of the analysis and ability to reflect on the practical implications of the recommendations made
- Quality and feasibility of the conclusions proposed
- Professional aspect of the work accomplished: the work must not simply consist of observations of what the current situation is; it must be useful, in a business sense, to the organization and be shown to be implementable.

The Port Management Series

UNCTAD's TrainForTrade Port Management Series (PMS) is published in English, French, and Spanish on a three-yearly cycle. This Volume – number 8 in the series – presents fifteen dissertations which have been judged to be the best from the recent cycles of the English-speaking Network. The participants involved come from ports in Ghana (cycle 4), Indonesia (cycle 4), Malaysia (cycle 1), Nigeria (cycle 2), and the Philippines (cycle 2).

This introductory chapter gives background information on UNCTAD and the PMP and explains the dissertation process. The following chapter includes a profile of each participant followed by a summary of their report and recommendations. The final section of each summary links the recommendations to directly relevant Sustainable Development Goals (SDGs) including their targets and indicators. Where possible, an update on any aspect of the report and recommendations that have been implemented concludes the summary.

The dissertation process is a professional tool encompassing research, report writing and presentation through which the author demonstrates his or her insights, knowledge, and abilities in an important aspect of their organization. The output is focused on a real business issue for the port and as such is a valuable resource and a significant contribution to their employer organizations. The dissertation is looked upon as a professionally produced business report for management to review and act on, where they see fit.

Collectively, the dissertations, which are held on a searchable database, provide a collection of case studies that make up a tremendous source of shared knowledge for members of the PMP Network.

The final chapter of the PMS volume 8 links the SDGs, which came about at the United Nations Conference on Sustainable Development in Rio de Janeiro in 2012, with recommendations for actions proposed by the participants. In many of the case studies it has been possible to identify specific targets and indicators used within ports to assess progress in meeting the aims of the SDGs. All the port communities represented in this publication take seriously their obligations in relation to contributing to improving environmental standards and facilitating economic development.

Partners of the English-speaking Network of the PMP

This section presents the views and opinions of the key supporting bodies of the English-speaking Network of the Port Management Programme on the island of Ireland.

Statement of Mr. Michael D. Higgins, President of Ireland

Figure 2: Photo of Mr. Michael D. Higgins, President of Ireland

"As an island nation, almost uniquely depending on international trade, we in Ireland know and value the importance of our ports, and all who work there.

The UNCTAD TrainForTrade programme is vitally important in achieving the 2030 Agenda for Sustainable Development and the Paris Climate Accords and I am so very proud that our ports here in Ireland and Irish Aid, have been participating with the English-speaking network."

Figure 3: Photo of Mr. Michael D. Higgins (sitting, third from left), President of Ireland, with delegates from UNCTAD Port Management Programme, Áras an Uachtaráin/Office of the President of Ireland, Dublin, June 2018"

Irish Aid

Statement of Mr. Ruairí de Búrca, Assistant Secretary, Development Cooperation and Africa Division/Irish Aid, Department of Foreign Affairs and Trade, Ireland

Figure 4: Photo of Mr. Ruairí de Búrca (right), Assistant Secretary, Development Cooperation and Africa Division, Irish Aid, Department of Foreign Affairs and Trade, presenting a certificate, Training of Trainers Workshop for the English-speaking network in Belfast, Northern Ireland, July 2019

"Irish Aid is pleased to have supported the English-speaking network of the Port Management Programme since its launch in 2007. We have met the port managers participating in the programme at the training of trainers workshops held in Belfast, Dublin and Cork ports and seen first-hand their enthusiasm for expanding their knowledge and commitment to improving their ports' performance. We rely on the invaluable support from ports across the island of Ireland whose staff share their expertise and experience and consistently display their personal dedication to the programme. The success of the programme is underpinned by the professionalism with which it is run by a small team in UNCTAD and the high level support it enjoys from UNCTAD's Secretary General, Dr Mukhisa Kituyi.

When the President of Ireland, Mr Michael D. Higgins, received the programme participants at his official residence in 2018, he noted the UNCTAD TrainForTrade programme was vitally important in achieving the 2030 Agenda for Sustainable Development. The global threat posed by the COVID-19 pandemic is highlighting the importance of critical supply chains and maritime trade. The TrainForTrade Port network responded quickly issuing a technical note on port responsiveness to COVID-19. We are confident that the Port Management Programme can meet the practical challenges posed by the pandemic. It has an important role to play in promoting continuous improvement of management so that ports in developing countries can assist in maintaining international trade and re-booting local economies in the face of the crisis."

Figure 5: Photo of H.E. Mr. Michael Gaffey, Ambassador, Permanent Mission of Ireland to the United Nations (2nd from left) with representatives of UNCTAD and ports of Belfast, Cork and Dublin, Signing ceremony of the memorandum of understanding, Geneva, April 2018

Belfast Harbour Commissioners

Statement of Mr. Trevor Anderson, Director of Infrastructure and Business Transformation at Belfast Harbour Commissioners

Figure 6: Photo of Mr. Joe O'Neill, CEO, Belfast Harbour Commissioners

"Belfast Harbour is immensely proud to be involved in the English-speaking network of the UNCTAD Port Management Programme. Having participated in the programme for the last ten years we have witnessed the significant contribution it can make to the progress and facilitation of world trade. As a result, we made the decision in 2019 to become a full partner in the programme. Hosting the UNCTAD Training of Trainers event in July 2019 provided a wonderful opportunity to involve more of our management team in discussions with delegates from ports from many countries. The views and experiences shared in these sessions are of immense value and our staff members enjoyed and benefitted greatly from their participation. We look forward to extending such a learning opportunity to other members of our team.

As Northern Ireland's primary gateway to the world and its primary logistics hub our goal is to deliver best-in-class infrastructure, built assets and services to support and promote trade flow in the region. In this respect we continue to find the port performance statistics published by UNCTAD immensely useful in our ongoing benchmarking and performance improvement initiative.

We very much look forward to participating in future events and continuing to learn together."

Figure 7: Photo of a crane at the Belfast Port

Port of Cork Company

Statement of Mr. Brendan Keating, CEO, Port of Cork Company

Figure 8: Photo of Mr. Brendan Keating, CEO, Port of Cork Company

"The Port of Cork is very pleased to continue working with UNCTAD on the Port Management Programme English Speaking Network. This unique initiative helps bring together Port Personnel from around the world to share knowledge and build standards of excellence and professionalism in our industry.

By participating in the programme Port of Cork Personnel get to broaden their experience, strengthen their knowledge and understanding of the industry and grow a network of industry contacts globally. We look forward to the recommencement of the programme once it is safe to do so, post Covid 19.

The Port of Cork Company reaffirms our commitment to work together with the other Irish ports to support the United Nations Conference on Trade and Development (UNCTAD) Port Management Programme – English Speaking Network. In directly assisting port communities in developing countries to achieve efficient and competitive port management we play our part in bringing port managers together from public, private and international entities to share knowledge and expertise and strengthen talent management and human resources development. Our Port Team equally gain from our involvement in supporting this programme and as we seek to promote and develop our own Port as world class, enterprising and innovative we see our role in implementing training and capacity building activities for the benefit of developing countries within the framework of UNCTAD's TrainForTrade Port Management Programme as a unique learning opportunity for the Port of Cork.

As a Port which seeks to be flexible in the development of trade and economic growth we service the requirements of all six shipping modes i.e. Lift-on Lift-off, Roll-on Roll-off, Liquid Bulk, Dry Bulk, Break Bulk and Cruise. This range of experience allows us to host UNCTAD Training of Trainers events in turn and give an unrivalled insight into the management of a diverse Port. This learning was set to continue this year as we were to host the UNCTAD Port Management Programme - English-Speaking Network, Modern Port Management - Training Of Trainers event in Cork on 3-9 June 2020, whilst this event was deferred as a result of Covid-19 pandemic we look forward to our continued involvement in this unique initiative, sharing and learning in different ways as we progress."

Dublin Port Company

Statement of Mr. Eamonn O'Reilly, CEO, Dublin Port Company

Figure 9: Photo of Mr. Eamonn O'Reilly, CEO, Dublin Port Company

"Dublin Port Company (DPC) is a State-owned commercial company responsible for operating and developing Dublin Port which is the largest freight and passenger port in Ireland. All cargo handling activities in the port are managed by private sector companies operating in competitive market conditions serving the needs of the economy and our stakeholders in an efficient and effective way.

Dublin Port handles almost 50% of all trade in the Republic of Ireland. The port is located in the heart of Dublin City with excellent road and rail connectivity to all parts of the island of Ireland. Since 2007 Dublin Port Company has supported UNCTAD's Port Management Programme (PMP) assisting port communities in developing countries. Together with Port of Cork and Belfast Harbour we share the knowledge and expertise of our people in hosting training and development events for port managers from around the globe and by delivering training programmes and joining in dissertation juries at home and abroad.

It is important also to acknowledge the continued financial support provided to the PMP by the Government of Ireland through the Department of Foreign Affairs and Irish Aid.

The Port Management Series (PMS), now in its eighth year, provides a unique opportunity for port managers from developing countries who have been judged to have produced the best quality dissertation in their PMP cycle to see the fruits of their labour in print in an official UNCTAD publication. This is an important milestone in their careers and a source of pride for their families. PMS volume 8 is a useful research tool and a source of knowledge about current happenings in ports in developing countries. DPC wishes the PMP continued success in serving the training needs of middle-managers from ports in developing countries."

Figure 10: Photo of Crane No. 292 at entrance to Port Centre, Dublin Port

PORT MANAGEMENT CASE STUDIES

A. INDONESIA

Statement of Mr. Arif Suhartono, President Director PT Pelabuhan Indonesia II

Figure 11: Photo of Mr. Arif Suhartono, President Director, PT Pelabuhan Indonesia II

"As the largest port operator in Indonesia, PT Pelabuhan Indonesia II also known as IPC has prioritised keeping trade flowing continuously in accordance with the Company's motto: "Energizing Trade, Energizing Indonesia".

With the uncertainties and challenges in the current time caused by the outbreak of Covid-19, we understand that the maritime industry is playing an essential role in the response, as around 80% of global trade is transported by sea. IPC agrees on the importance of ports giving a strong signal of confidence in keeping the flow of goods and services by implementing adaptive strategies to maintain trade activities. Thus, we are committed to ensuring the availability of 24/7 port services across all 12 ports that we manage. Round the clock services will be continuously preserved and we will also implement strongly the necessary health and safety protocols throughout the entire working environment.

We acknowledge that UNCTAD through its TrainForTrade (TFT) Network is also deeply concerned with the situation. UNCTAD's technical note of Port Responsiveness in the Fight Against the "Invisible" threat: Covid-19 can give us best practice illustrations on how ports should act with protocols. We also understand that UNCTAD's Port Management Programme (PMP) gives us an example on how training programs conducted using online IT support enable participants from distant places across the world to discuss and share information that is most suitable to the current pandemic time.

IPC has started to build an online based training program in Indonesia. IPC is very lucky to have opportunities for a number of our people to join the UNCTAD programmes in the past. For those reasons, we do appreciate and thank UNCTAD for PMP and the TFT Network. Hopefully this programme will continue in order to strengthen knowledge and skills through innovative approaches for sustainable port and world economic development."

Optimisation of Digital Culture Implementation at Head Office of PT Pelabuhan Indonesia II

Author of the case study: Ms. Sari Saraswati, Senior Officer of Performance Management, IPC

Figure 12: Photo of Ms. Sari Saraswati (author)

Mentor: Mr. Rio T.N Lasse, Executive Vice President – Corporate Strategic Planning, IPC

Figure 13: Photo of Mr. Rio T.N Lasse (mentor)

About the author

Ms. Sari Saraswati joined the port industry in 2013. Her background is city planning and urban development. When asked about her career change, Ms. Saraswati replied:

> "Indonesia is an island country and ports play an extremely important role in so many ways. I thought at the time that perhaps if I work in the port community, I can bring about a positive impact to the development of my country."

Ms. Saraswati joined the UNCTAD Modern Port Management course at the last minute through the recommendation of the Human Resources Department.

> "In the beginning I did not know much about the programme, but my gut told me to take this unique opportunity on. As I proceeded, I improved my knowledge, my perspective, and ways of thinking – not only in terms of technical and operational aspects but also organizational and management too. This programme equipped me with the capability to have a meta view of the port."

Talking about her most memorable moment from the course, Ms. Saraswati mentioned that the UNCTAD Port Management programme serves as a community building platform for her and her cohort:

> "With fellow participants, we are still keeping in touch regularly. We always studied together before the exams and helped each other through the programme, and this really built connections among us all. It was very valuable to be able to exchange and share knowledge with colleagues from different ports while building a personal connection. Before the UNCTAD programme, we were quite competitive with each other. Now, we are collaborative. The resulting network between participants from Pelindo 1, IPC, Pelindo III, and Pelindo IV – and the expert lecturers, helps me get information for my work also."

As a tip to future participants, Ms. Saraswati believes it is important to pair up with a mentor who has strong interests in the challenge and can support future implementation of the recommendations. Indeed, Ms. Saraswati's dissertation work focused on an actual project which was on-going at her office. Her supervisor, who was also her mentor, could see the added values of her work right away and integrated some recommendations into the project.

Background

PT Pelabuhan Indonesia II also known as IPC is a state-owned enterprise responsible for managing twelve ports across ten operational areas (see Figure 14) in the largest and most populated islands which constitute the archipelago of Indonesia, namely Sumatera, Java and Kalimantan. IPC, is one of four Pelindos (port entities) organised on a regional basis charged with managing the 111 state-owned ports in Indonesia. The majority of IPC ports are small to medium in scale and focused on specific cargoes such as palm oil, coal, and other bulk commodities. However, IPC manages the Port of Tanjung Priok, Jakarta which is the biggest port in Indonesia and responsible for more than 50% of the sea-trade in the country.

A major modernisation programme is underway nationally in recognition of the fact that sea transportation is a vital aspect of the country's trading infrastructure, carrying over 90% of internationally

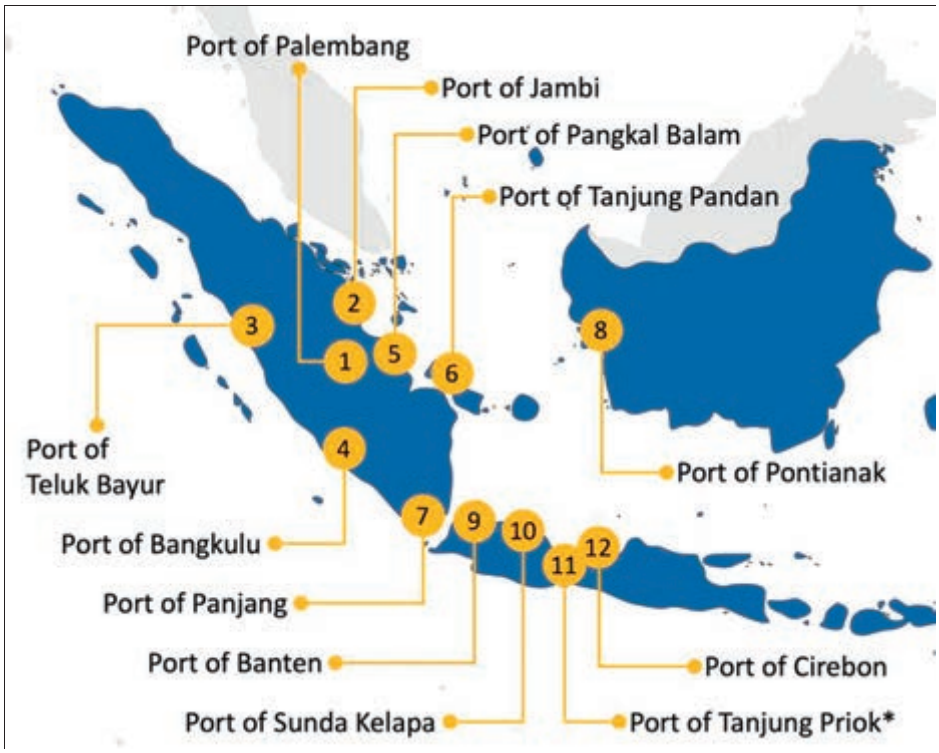


Figure 14: Ports controlled by IPC

traded goods. Additionally, inter-island shipping services represent about 14 million passengers a year and over 300 million tonnes of cargo volume. IPC is at the forefront of the modernisation effort and has most influence as the operator of the biggest ports with highest throughput.

Introduction

This case study examines the current state of readiness of IPC to react to the rapidly changing environment facing world ports by adopting a business strategy encompassing new technologies. The author recognises that increasing digitalisation across all operational and service offerings is the key to meeting customer needs and delivering customer satisfaction. IPC II is focussing on its more than 2,600 staff, most of whom are in the 26-36 age range, as it develops and implements its long-term strategy to meet the challenges of transforming from a traditional organizational culture to a digital culture.

The objective of the case study is to benchmark the current organizational culture of IPC and map those findings to the factors that are present in a business with a digital culture. The author makes recommendations about what actions are needed to ensure that the business can successfully transform itself into an organization with an appropriate digital culture which meets the needs of the business and its stakeholders.

Through a combination of structured analysis and original qualitative research the author concludes that IPC is not yet fully prepared for digital transformation. The main barrier to success in delivering the digital strategy lies in the area of organizational structure and lack of necessary communication to bring its people on the journey towards a new digital organizational culture.

Analysis

The dissertation paper focuses on six factors out of fourteen elements identified as necessary to conduct a "Digital Culture Audit" as developed by *Rowles and Browne* (2017). Reducing and simplifying the audit tool to six key factors allowed the author to select only those measures that relate to people. This is viewed as important because human capacity development is crucial to developing, supporting, and implementing

a digital culture within IPC. The six important factors examined in the study are:

1. Definition and vision
2. Leadership
3. Agility
4. Environment
5. Skills and Talent
6. Structure

Questionnaires were issued to 100 of the 524 employees based in IPC Head Office. The survey which was conducted using on-line forms had a 98% response rate, of which 54% were in the age group 25-34, 22% in 35-44, and 24% over 45. The age factor is significant because, as we shall see, the findings of the research demonstrate a clear attitudinal divide between millennials and more senior respondents regarding the stance they hold on IPC's existing strategy to communicate what a digital culture really entails and the level of engagement with staff.

Each of the above six factors is linked to three statements which people were asked to consider, for example under the heading 'Agility' the three statements are:

1. You have the ability to work with other departments/divisions in implementing digital projects.
2. Your leader encourages you to be able to make decisions and shorten bureaucracy if possible.
3. The company responds responsibly and makes decisions when digital project initiatives exist.

The author uses the diagram in Figure 15 below to demonstrate the difference between old and new operating models for business. The key lesson here is that being a digital port means not only using the latest technology but also becoming connected with our customers and all (relevant) stakeholders in the port industry.

The author notes the vital role that organizational culture plays in implementing IPC's planned digital transformation. The work of *Rowles and Brown* (2017), is referenced to demonstrate that culture may vary over time in a way that impacts on the organization: "culture is the sum of the values, behaviours, and norms of those in the organization – which supports the company today and may end up inhibiting progress tomorrow".

Finally, reference is made to Figure 16 below from an internal report by Accenture (2018), which points out the overlap of digital capabilities such as technology, people and processes and a corresponding digital culture or set of behaviours designed to enable the digital transformation.

Figure 15: Comparison of business operating models

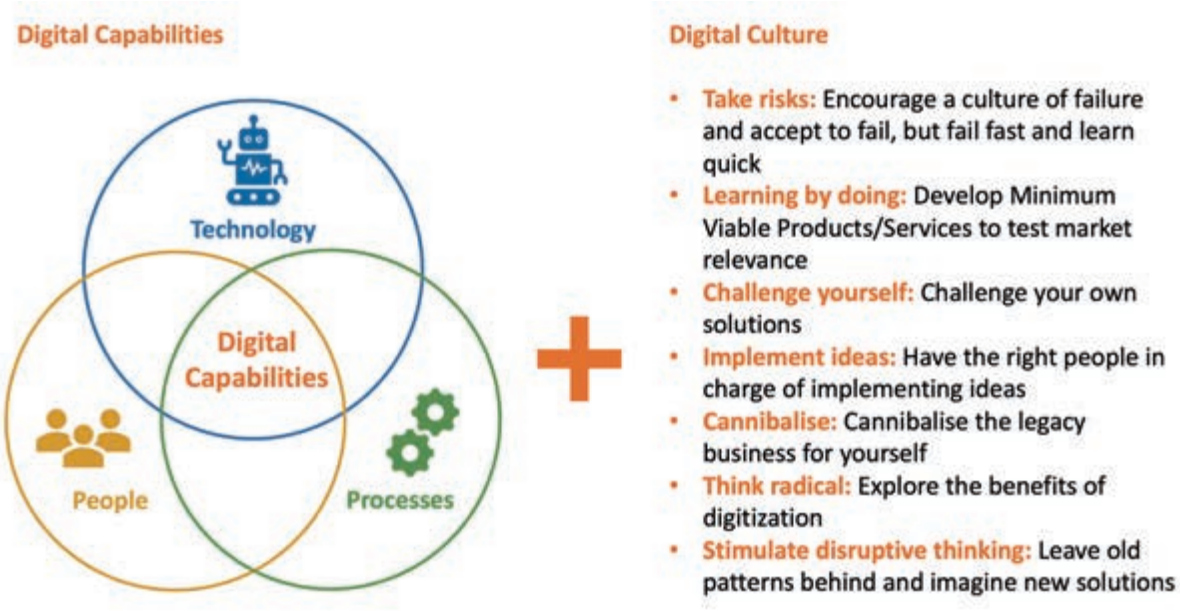


Figure 16: Combining digital capabilities and digital culture

Conclusions and recommendations

The case study takes in consideration the complex picture shown in Figure 17 below which shows the digital vision of IPC and makes the following conclusions and recommendations.

The study concluded that IPC must develop a more intensive and far-reaching communication strategy to inform all stakeholders about its digitalization strategy and in particular what the transformation will mean for its employees.

The research showed that the staff are the most important determinant of a successful transformation from the traditional to the digital culture. Additionally, in order to build a digital culture IPC needs first to understand the current culture within the organization. It is recommended to employ digital culture audit tools to support its transition to a new digital culture.

The research results concluded that IPC is not yet ready to successfully transform to a digital culture. This finding is based on the overall score of 3.72 out of 5 across the 6 factors that featured in the on-line questionnaire. More specifically, a score of only 2.34 under Structure and 3.58 and 3.81 respectively under Skills and Talent, and Leadership shows that employees in Head Office do not believe that they are equipped with the necessary skills or have the required mentoring and leadership to deliver the new strategy successfully. The research shows that most employees believe that the current organizational structure does not serve the needs of a digital culture transformation.

The study recommends that a special structure should be established within the organization. The team in this special structure will be responsible for the digital transformation project. The new structure – DIGILAB – will be staffed by individuals skilled in digital technologies. The Human Resources department will have a role in informing all staff about the capacities and skills they will need to develop to contribute to the digital transformation of the organization.

The variation in response between young and older members of staff indicates that there is a need to provide more training and information to senior managers about the need for and impact of digitalisation on business processes.

Finally, based on the survey results, the study concludes that all management must become 'champions' of the new digital strategy so that they can become role models for the staff who report to them. The pathway for IPC to become "A World Class Trade-facilitator" as described in Figure 17 below will be facilitated through adopting the recommendations set out in this case study.

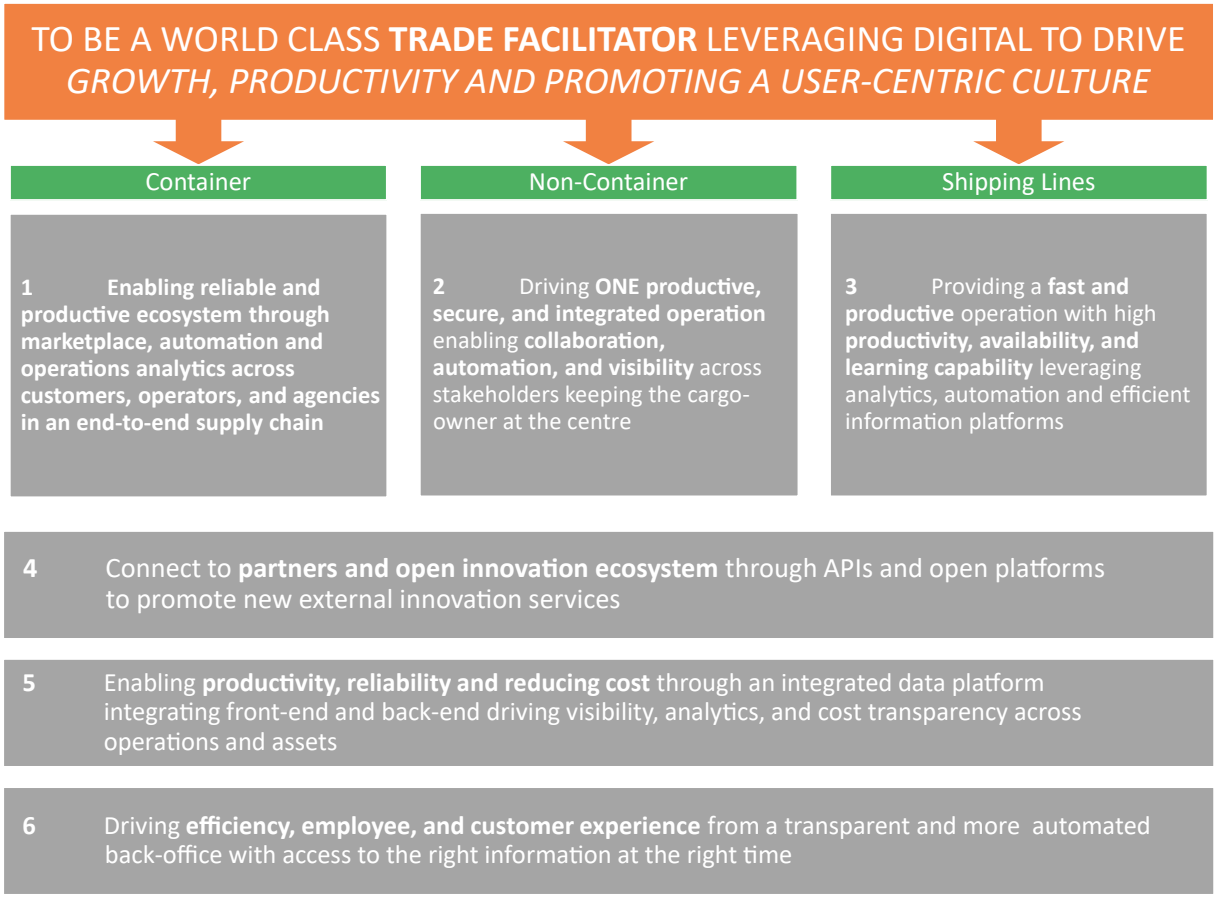


Figure 17: World-class trade-facilitator

Business Strategy for Port of Meulaboh to Increase its Contribution to Pelindo 1

Author of the case study: Mr. Aditia Fahreza Nasution, Manager of the Business Partnership - Project Management Office for the Strategic Corporate Actions, Pelindo 1

Mentor: Mr. Sandhy Wijaya, Business Director, Prima Husada Cipta, Medan

Figure 18: Photo of Mr. Aditia Fahreza Nasution (author, right) and Mr. Sandy Wijaya (mentor, left)

About the author

The UNCTAD Port Management Programme was the first English language training that Mr. Aditia Fahreza Nasution took part in. Mr. Nasution said he was nervous about learning in a language that is not his mother tongue, but his motivation pushed him through.

> "My motivation when participating in this programme was that I wanted to upgrade my soft and hard skills, update information from Indonesia and globally, and more importantly, I strive to one day become a trainer for my company and give back to the port community. The UNCTAD course gave me the opportunity."

Mr. Nasution also mentioned that his inspiration was Mr. Imron Eryandy, who graduated from the very first cohort of the UNCTAD Port Management Programme in Indonesia. Mr. Eryandy graduated at the top of the class and progressed steadily in his career and self-development. Moreover, Mr. Eryandy made it known that he greatly appreciated the experience he received from the UNCTAD programme. "I looked at him and I thought, 'he is my role model!'" said Mr. Nasution. "But it took me a few years to finally apply to the UNCTAD programme. Even to this day, I haven't told Mr. Imron about his influence but perhaps I should", Mr. Nasution replied.

Mr. Nasution believes that the programme helped build a strong network both inside the country and globally.

> "I learned a lot from my mentor and from my colleagues from IPC, Pelindo III, and Pelindo IV. It was very interesting to have feedback and exchanges with international experts, colleagues from abroad, and of course, people from different ports and departments within the company.
>
> I strongly encourage UNCTAD to continue delivering this programme for my colleagues in the port community. The programme helps enrich the knowledge on port management, hard and soft skills, and provides an exchange platform for people in the port community. The impact from the UNCTAD Port Management Programme for me is that now I am accustomed to new ways of thinking and being able to apply and exchange ideas with colleagues, particularly among Pelindo 1, IPC, Pelindo III, and Pelindo IV. For the local network, this programme also helped us a lot with community building. All the participants are still talking with each other and helping each other on various challenges that arrive at work."

Background

The Port of Meulaboh in the West Aceh area of Sumatra falls under the management and control of Pelindo 1. The focus of this dissertation is on the port of Meulaboh which is a small-scale port operation with just two docks. The port has been lacking in infrastructure development for many years.

The port and surrounding area was devastated by the Indian Ocean tsunami of 2004 that hit the coasts of several countries in South and Southeast Asia in December 2004. The tsunami and its aftermath were responsible for immense destruction in Aceh. Indonesian officials estimated that the death toll there ultimately exceeded 200,000 people with the majority of fatalities in northern Sumatra's Aceh province.

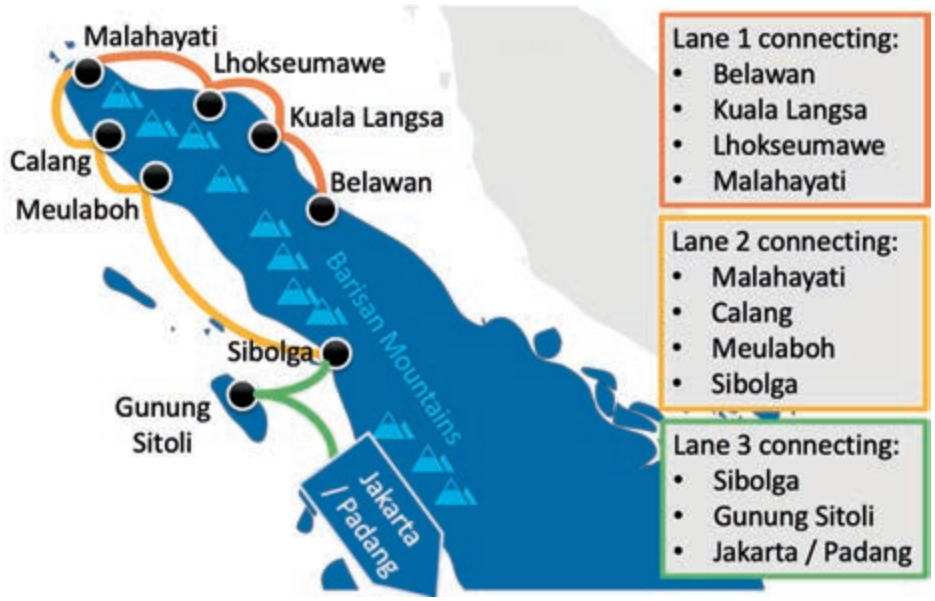


Figure 19: Sumatra three options for short-sea shipping lanes

Ports in Indonesia are undergoing a major modernisation programme in recognition of the fact that sea transportation is a vital aspect of the country's trading infrastructure, carrying over 90% of internationally traded goods. Additionally, inter-island shipping services represent up to 14 million passengers a year and over 300 million tonnes of cargo volume. Pelindo 1 is a state-owned enterprise responsible for managing 16 ports and 5 subsidiary companies including the strategically and economically important port of Belawan near Medan, alongside the Malacca Strait, the world's busiest shipping lane.

The contention in the paper is that developing the port of Meulaboh will lead to a significant shift away from the current practice of transporting goods by road in favour of the more cost-effective and much more environmentally friendly shipping mode.

Introduction

This case study examines the business case for developing the port of Meulaboh through investing in upgrading its two existing docks and identifying new business opportunities in the area which will generate more revenue and increase employment for local people. The port handles two modes of traffic namely bulk liquid and general cargo.

The strategy proposed will need to consider the views of the local community and other relevant stakeholders including the local authority which has part ownership interest in one of the two docks in the port. It is recognised that there is an opportunity to align the new business strategy with a more environmentally sustainable and community focussed business model and that this is in keeping with the Sustainable Development Goals of the United Nations 2030 Agenda.

The researcher uses a number of business analysis models such as SWOT, BCG, PEST and others to examine the environment within which the port operates. The conclusions from the environmental scanning lead to recommendations designed to set the port on a new course towards increased revenue streams. There will be a greater focus on meeting the needs of all stakeholders including private sector businesses, local communities and the owner, Pelindo 1.

Figure 19 above represents the potential short-sea-shipping links between Meulaboh and Sitoli to the south, Meulaboh and Malahayati to the north, and to the major port of Belawan to the west. The map on Figure 20 below shows the imposing presence of the Barisan mountain range which dissects Sumatra making east-west road transport slow and arduous and creating a potential competitive advantage for shipping.

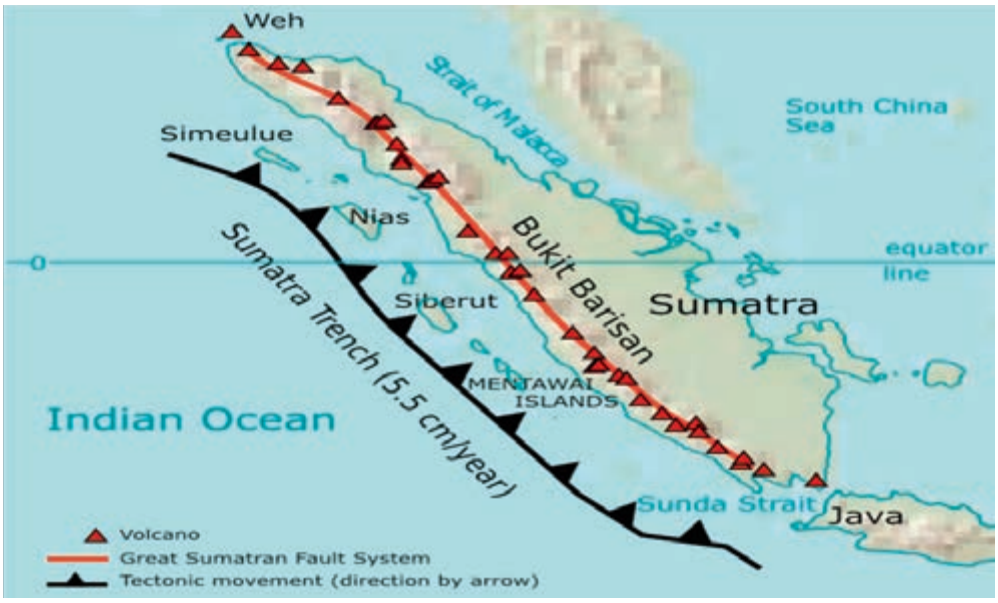


Figure 20: Map of Barisan mountain range

Analysis

The stated aims of the case study are:

1. To define the current operating environment of Meulaboh Port and point out potential growth areas for it to exploit.
2. To set out the Strengths, Weaknesses, Opportunities and Threats (SWOT) facing the business.
3. To design a roadmap for the port leading to increased investment by leveraging its hinterland and internal/external opportunities.
4. To devise a cost benefit analysis plan for much needed investment in equipment and facilities to facilitate an increase in throughput.
5. To align its development plans with the vision, mission and financial targets set by Pelindo 1.

The jetty operated jointly with the local authority is in reasonably good condition. It will be necessary for Pelindo 1 to sign a cooperation agreement with the local authority to bring this dock back into full commercial use.

The indicators are good for continued economic growth in Indonesia where the central bank estimates that the economy will grow by 5.8% per annum up to 2022. With a population growth rate of 1.5% in Aceh, the signs are positive that increased production, distribution, and consumption will lead to increased demand for transport.

An internal PwC report on "Strategy and Impact Analysis" for Pelindo 1 states:

> "Projections of the world economy (GDP per country) in the long term is dominated by emerging markets and Indonesia (currently in 8th place) will climb to fourth in terms of GDP by 2050. On average, emerging markets can grow twice as fast as developed economies. Therefore, to achieve its long-term potential economic growth Indonesia must invest in infrastructure such as ports, roads and other transport infrastructure."

Analysis of the hinterland around Meulaboh Port shows the huge potential offered by developing trade in agricultural products such as rice, soybeans, peanuts, corn, green beans, and cassava. Additionally, the analysis points to even greater potential arising from plantations for rubber and palm oil and the handling of output from mining companies located in the hinterland.

The author identifies and recommends two strategic initiatives that Meulaboh should carry out in the short term to build throughput in the port and revitalise the local economy.

Firstly, Meulaboh should use diversification as a business growth strategy by servicing the local Crude Palm Oil and Coal Mining industries.

Figure 21: Aerial view of jointly operated jetty

Secondly, Meulaboh should grow the existing marine services on offer to include the provision of Pilotage Services and Person in Overall Advisory Control (POAC) to the private operation within its domain. The POAC is a requirement under the *International Convention for the Prevention of Pollution from Ships* (MARPOL Convention) whereby all transfer operations undertaken at sea involving specific cargoes (see MARPOL Annex 1 – Regulations for the Prevention of Pollution by Oil) are co-ordinated by a designated qualified person (POAC) who is the single advisory control for the ship-to-ship (STS) transfer operation. Compliance with the MARPOL Convention will also align port operations with SDG 14 – Conserve and sustainably use the oceans, seas and marine resources for sustainable development.

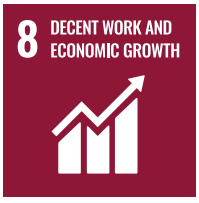
Conclusions

The study has identified several unexploited business development opportunities in the hinterland of Meulaboh Port. It also points to several marine services that could be extended to new customers to increase revenue for the port.

A detailed cost benefit analysis shows the financial returns to be gained should the port management invest in infrastructure to enable the port handle new products such as crude palm oil and coal and service bigger vessels.

Sustainable Development Goals

In the 2030 Agenda for Sustainable Development, sustainable transport is mainstreamed across several SDGs and targets. The targets of relevance to this case study and its recommendations are especially those related to:



SDG 8 – Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

Economic growth and decent work opportunities stem out of the investment and employment opportunities for local people as a result of the new port business emanating from Meulaboh.

SDG 11 – Make cities and human settlements inclusive, safe, resilient and sustainable

Using ships to transport thousands of tonnes of produce currently moved by lorries will significantly reduce green-house gas emissions in cities and towns. The particulates from burning hydrocarbons are responsible for air pollution and damage the health of citizens. Reducing diesel fumes from Heavy Goods Vehicles (HGVs) will lead to an improved environment and a better health outlook for citizens affected by airborne pollutants. There is likely to be a significant decline in road injuries and fatalities as the number of lorries on the roads is reduced substantially.

SDG 14 – Conserve and sustainably use the oceans, seas and marine resources for sustainable development

Better regulation and monitoring of loading and unloading during ship-to ship and ship-to-shore operations will mean less product polluting the waterways. This will lead to a cleaner marine environment in which aquatic life can thrive and provide improved fishing for local fishermen whose standard of living will improve.

B. MALAYSIA

Statement of Mr. Nazry Bin Yahya, Principal, Johor Port Skills Centre

Figure 22: Photo of Mr. Nazry bin Yahya, Principal, Johor Port Skills Centre

"Johor Port Berhad is part of MMC Corporation Berhad, a leading utilities and infrastructure Group with diversified businesses under four divisions, namely Ports & Logistics, Energy & Utilities, Engineering, and Industrial Development.

Johor Port is the Premier Southern Gateway Multi-Purpose Port facility located at the southern tip of Peninsular Malaysia providing a comprehensive range of port services to meet the needs of its customers. With 24 berths and a total berthing length of 4.9 km, the services and facilities within Johor Port include the Container Terminal; Bulk and Break Bulk Terminal; Liquid Terminal; Marine Services; Offshore Inspection & Marine Repair Services; and Warehousing Facilities. As the Regional Commodity Hub, Johor Port is the world largest Edible Oil Terminal and one of the largest Hubs in the region for London Metal Exchange (LME) cargo. In 2004, Johor Port was designated as an Approved LME location. Johor Port is also the first port in Malaysia to be accorded with the Free Zone status.

To date, Johor Port Berhad had won numerous awards such as the Global Business Leadership Award (Asia Pacific Business Council), Global Performance Award - World Class (Asia Pacific Quality Organization), Bulk Liquid Port/Terminal of the year (Global Port Forum) and Industry Excellence Award (MITI Malaysia).

World ports today are still relevant to provide a cost-effective way for the bulk movement of goods. However, times are changing thus the way of managing the ports too changes. To remain profitable world ports need to relook at their competitive advantage and capitalize on it. For Johor Port, our focus is to review the types of cargo to be handled, knowledge building and obtain cost effectiveness.

Firstly, Johor Port's focus is to become the premier regional commodity hub. The port planning is geared to position the port to be designated as an approved delivery point under the various International Commodity Exchanges. The facilities upgrade planning looks for the opportunity to increase the warehouse capacity and the terminal capacity. The cargo that we focus on includes cocoa, rice, coffee, palm oil, coal, steel, copper, nickel, tin and aluminum.

Secondly, a great port will always be supported by knowledgeable port staff and community. That is why we created Johor Port Skills Centre (JPSC) to train our staff and the port community to obtain adequate port knowledge. In addition to that we have internally designed specific programs to reach all work levels of our staff, so they remain relevant. For instance, we have the Leadership Accelerated Program (for senior managers), the Management Development Program (for managers), the Supervisor Development Program (for supervisors), and various port short courses. Our collaboration with UNCTAD alongside Johor Port Authority to host the prestigious TrainForTrade Port Management Programme too has produced excellent port managers.

Finally, by being focused and equipped with knowledgeable port staff, Johor Port is better positioned to offer competitive rates. Our comprehensive offerings will allow shorter port stays for shipping, transparent costing and effective cargo handling. This will help to ensure that our customers' needs are satisfied, and they will be happy to continuously call at Johor Port Berhad."

A Study on the Accumulated Mixed Bulk Cargo Wastes at Bulk and Break-Bulk Department of Johor Port Berhad

Author of the case study: Ms. Siti Kamariah Binti Md Shahrin, Manager in Corporate Planning and Risk Management Department, Johor Port Berhad

Mentor 1: Mr. Mohd Zahari bin Mohd Rusjuna, Health, Safety & Environment Manager, Johor Port Berhad

Mentor 2: Captain Mohamad Taufiq bin Abdul Latiff, Senior Manager, Bulk and Break-Bulk Department, Johor Port Berhad

Figure 23: Photo of (left to right) Mr. Hector Estrella Miole (jury member), Captain Mohamad Taufiq bin Abdul Latiff (mentor), Ms. Siti Kamariah Binti Md Shahrin (author) and Mr. Mohd Zahari bin Mohd Rusjuna (mentor)

About the author

Ms. Siti Kamariah Binti Md Shahrin has a background in chemical engineering and for many years she worked on onshore and offshore activities for the oil and gas industry. Ms. Shahrin changed her career path in 2010 when her family asked her to settle down, and the industry was experiencing downtime.

> "I was used to working in a largely male dominated space, still am. I was the first female member of the HSE [health, safety & environment] team earlier in my career and I was also the first female who went offshore."

For her, joining the port community was not in any way daunting.

> "I love new challenges in life and work. And I took the opportunity from the UNCTAD programme to develop my career and further enhance my knowledge. The commitment from expert lecturers, cooperation among our colleagues, and funny moments during the UNCTAD training will be part of memorable moments to be cherished for me."

When asked about her experience during the programme, Ms. Shahrin recalled that it was challenging, and she was very surprised to learn that she graduated among the top of her class.

> "There are lots of memorable moments during this UNCTAD journey. I did not expect to receive this achievement. At the time I started my work with a new department and my day was absolutely crammed with operational work. I had to prepare for my UNCTAD exams and dissertation during my off-hours and to be honest, I was very scared before the presentation. The compliments from my mentors and the president of the jury for my dissertation presentation made me burst into tears!"

Ms. Shahrin's case study focused on a key problem she observed from her daily work. After the UNCTAD programme, the majority of the proposals in her final dissertation have been implemented.

> "It was a team effort. We looked into how to implement these recommendations and prepared a proper action plan. The operation continued even when I was no longer at my former department, Bulk and Break Bulk. Johor Port Berhad is committed to continuously improve and enhance our operation and services. In this aspect, the UNCTAD programme encouraged participants to tackle real challenges that bring about improvement at the port."

Since graduating from the UNCTAD programme, Ms. Shahrin also works as a part-time trainer for some elements of the Health, Safety & Environment (HSE) training at Johor Port Berhad.

Background

Johor Port Berhad (JPB) is a registered Malaysian company that manages and operates Johor Port in Pasir Gudang, Johor. JPB is strategically positioned in the heart of the sprawling 8,000-acre Pasir Gudang Industrial Estate. The area is home to a comprehensive range of industries specializing in petrochemicals, petroleum products, palm oil products, engineering, construction, electronic goods, furniture, telecommunications, ship repairs and services as well

as providing port operations services in (solid) bulk, break-bulk and liquid bulk.

Johor Port handles a total of 40 million tonnes of cargo annually, including 1.2 million twenty-foot equivalent units (TEUs) containers. JPB operates five terminals with twenty-four berths totaling 4.9 km and covers Containers, Bulk and Breakbulk activities. JPB is a multipurpose port that offers all types of port-related activities either directly or via contractors. Services offered include terminal management, cargo-handling, storage and logistics, warehousing, and marine services. JPB manages the Free Zone on behalf of Johor Port Authority (JPA).

Introduction

The Bulk and Break Bulk (BBT) operations department at Johor Port Berhad handles break bulk cargo (e.g. cocoa in bags, rice in bags) and loose bulk cargo (e.g. potash, cement, and wheat, etc.). Dealing with waste from bulk cargo in accordance with environmental regulations has become a major concern for the Head of Bulk Operations in the port. The situation is worsened by the accumulation, over time, of various types of bulk cargo waste which has become mixed together. A further problem has arisen because the recently appointed waste management contractor refuses to dispose of the mixed waste due to concerns about the nature of the waste and the lack of a licence.

This case study looks at the discharge of bulk cargo from ship to shore. The research delves into the problem of bulk cargo waste not being separated and disposed of in a controlled environment rather than being mixed with other waste and being categorised as scheduled waste. The handling equipment was looked at to see if the grabs used to handle bulk materials contributed to the waste by spilling product during the loading/unloading cycle. There were challenges in identifying the specific details of cargo wastes dumped on the quays in the bulk area because they had been there for a long time. Additionally, it was discovered that it was not possible to include new clauses or terms in current contractual agreements with recently appointed waste management companies.

One of the key performance indicators (KPIs) of the Johor Port Authority's Strategic Plan 2013-2020 was the implementation of a Green Port Policy and the creation of a safe and healthy port working environment. It is guided by the principles of protecting the community from harmful environmental impacts resulting from port operations as well as the prevention of pollution. To this end, the research looked at how JPB could ensure compliance with the *Environmental Quality Act 1974* of Malaysia which governs waste management.

The research methodology was a combination of site surveys, reviewing available sources of data on bulk products handled and one-to-one interviews with JPB Head of Bulk Operations, operational supervisors, and contractors and maintenance staff responsible for the bulk handling cranes and equipment. The contract documents between JPB and private waste contractors were also reviewed.

Analysis

Waste Management is a key element of the Johor Port Authority Green Port Policy 2013 to 2020. The overall objective is to have a proper waste management system in order to reduce its impact on the environment and health of the community. Bulk cargo is commonly transported, unpacked, in large quantities; they are usually dropped or poured, with a spout or shovel bucket. This can cause environmental issues such as cargo spillage and dust generation.

A cargo discharging plan is usually sent to the port ahead of arrival, and the vessel master will confer with the port representative to ensure that no excessive stress will be placed on the vessel hull and that there will be no damage to the ship from the cargo handling equipment.

Cargo trimming is mandatory for some cargoes, especially where there is a risk of the cargo shifting or liquefaction. Trimming minimizes the risk of cargo shift. In Johor Port Berhad, trimming contractors normally use excavators, shovels, and manual handling to perform trimming activities inside the vessel hold. Usually, bulk cargoes are collected by a crane using a remote grab, dropped into a conventional hopper or tipper and discharged into a lorry. Some of the cargo received by BBT are super-fine and require a specialised spill-proof remote grab. The crane/grab system has a higher rate of cargo spill onto the wharf surface when compared to a fully vacuumed pipe system. In Johor Port Berhad, it is estimated that there is currently up to 67 metric tonnes of accumulated waste collected and stored in uncovered roll-on/roll-off units as shown in Figure 24 below.

Figure 24: Accumulated waste on the quays

Accumulated wasted is collected by a waste management contractor. Johor Port Berhad recently re-tendered this contract and a new supplier was appointed and this has had a beneficial impact. The contractual agreement between the port and the waste management contractor states that the contractor is to manage all types of waste in the port. However, the contractor does not have a licence to manage scheduled (accumulated) waste. Up until November 2018, an approved local city landfill was used to dispose of separated cargo waste. However, this landfill has been closed, and the contractor is now transporting waste to an official land-fill site 60 km away.

This study found that there is no documented procedure setting out the roles and responsibilities for waste management, as well as a lack of general awareness in the port community of scheduled waste generation.

Figure 25: Accumulated waste product shown piled up under gantries in the bulk quay area

Recommendations

There should be continuous awareness training regarding scheduled waste for staff and related contractors to generate understanding of the legal requirements for handling different types of waste.

There should be proper and structured procedures/ instructions on waste management including an emphasis on the mandatory requirement to segregate individual waste, prohibiting mixing, and to avoid the creation of scheduled waste.

An improved design of remote grab will have a major impact on the reduction of bulk cargo spill around the wharf surface. BBT should also consider providing back-up remote grabs that can cater to all types of bulk cargo with a spill-proof design, such as that shown in Figure 26 below. Additionally, BBT has a fully vacuumed system that is used for bulk cargo like cement. However, it is not used regularly as many vessels are incompatible. Increasing use of the vacuum system will reduce spillage of such cargo.

Figure 26: Anti-spill grabs

The consignees for bulk cargo passing through the port should be required to collect spilled cargo once it has been collected by the port (or the port may do it for them and charge on the cost). Wherever possible the waste product should be re-processed and used for other purposes in line with the Green Port Policy of Johor Port Authority.

Sustainable Development Goals

In the 2030 Agenda for Sustainable Development, sustainable transport is mainstreamed across several SDGs and targets. The targets of relevance to this case study and its recommendations are especially those related to:

SDG 11 – Make cities and human settlements inclusive, safe, resilient, and sustainable

Reducing the amount of mixed waste that goes into landfill and increasing recycling and reusing bulk cargo waste will satisfy SDG 11 target 11.6[1] and indicator 11.6.1[2]. It also aids the sustainable management of land and meets the target of reducing environmental impact by paying special attention to air quality and waste management.

[1] By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management.

[2] Proportion of urban solid waste regularly collected and with adequate final discharge out of total urban solid waste generated, by cities.

Investigation on How to Reduce Freshwater Usage and Charges for Landscape Irrigation and Cleaning Activities for Johor Port Berhad

Author of the case study: Ms. Rabiah Binti Nadir, Property Manager, Facility Management Department, Johor Port Berhad

Mentor: Mr. Abdul Ghani bin Che' Mat, General Manager, Facility Management Department, Johor Port Berhad

Figure 27: Photo of Ms. Rabiah Binti Nadir (author, left) and Mr. Abdul Ghani bin Che' Mat (mentor, right)

About the author

Prior to enrolling in the Modern Port Management course, Ms. Rabiah Binti Nadir was working as a Manager at the Information and Communication Technology Department of Johor Port Berhad for over 14 years. In 2018, Ms. Nadir was transferred to the Facility Management Department as Property Manager and it was at the same time that she was selected to participate in the UNCTAD Port Management Programme.

Handling the big shift in her career and the demanding training programme all at the same time, Ms. Nadir admitted it was particularly challenging.

> "It was a 360-degree change in my career. I had to manage my daily tasks in the new department, where I had to learn from zero. Meanwhile, I had to attend the UNCTAD classes, go through examinations and complete my dissertation. I worked after the office hours very often."

Although it was not an easy time, Ms. Rabiah believed it was definitely worthwhile.

> "There is so much value from attending the programme, and not only for career development. For me, I am now more confident in my daily decision-making because of the knowledge gained throughout the UNCTAD programme. I feel that I am now capable of contributing back to my port community. I can assist my department and help others. The UNCTAD programme provides a knowledge exchange platform that everyone should attend if they can."

Ms. Nadir was surprised to learn about her achievement in the programme when she was informed that she graduated among the top of her class.

> "I wanted to do my best to give back to Johor Port. I decided to challenge myself and picked a topic which was quite technical for my background but is useful and relevant for my department".

She expressed her heartfelt gratitude to her mentor for introducing her to the different departments at the port as this played an important part in her dissertation work.

With the support from her mentor and colleagues, Ms. Nadir's department has promoted her dissertation's recommendations for the Departmental Process Excellence (DPEX), year 2020. The project is expected to begin operating in August 2020 and the results will be evaluated in December 2020.

Throughout her years at the port, Ms. Nadir has always put efforts into continuous learning and self-development, attending many training courses before embarking on her journey with the UNCTAD programme. Even after her graduation from the programme, she also attended other training and is currently involved in 'Process Excellence Project' where she helps others on data collection, a task she personally struggled with the most when writing her own dissertation. "I understand how difficult it can be and I would like to help others", said Ms. Nadir.

Background

Johor Port Berhad, on the outskirts of the city of Johor Bahru, on the south-eastern tip of Malaysia, is an integrated multi-purpose port providing a comprehensive range of port services. Employing over 1,200 people and situated on over 1,000 acres, there are five terminals with twenty-four linear berths

Figure 28: Flooding in Johor Port Berhad in 2018

offering a capacity of over 40 million tonnes. It is the world's largest palm oil terminal, storing, an average of 460,000 tonnes of product at any given time.

Since 2006, Malaysia has sought to increase its water reserves and implement a water savings programme. In March that year it was mandated by the Government that large buildings would be required to install a rainwater harvesting system (RHS). Two laws, the *Water Services Industry Act 2006* and the *Water Services Commission Act 2006*, that encouraged the implementation of water conservation systems were passed.

Introduction

As part of the Green Port Policy introduced in Johor Port Authority's Strategic Plan 2013-2020, Johor Port Berhad has developed a 'clean and green' concept and has won awards for this initiative between 2012 and 2019. The port has a landscaped environment in which the plants help absorb carbon dioxide emitted during operations and reduce urban heat around buildings. However, this andeavor requires maintenance through irrigation. Currently all the water used for this and for cleaning operations is fresh, processed water. One of the objectives of the Green Port Policy is to minimize water consumption and thereby reduce the quantity of processed water for landscaping and cleaning operations.

Using a quantitative approach this investigation proposed a design for a cost-efficient rainwater harvesting system that will reduce the use of processed water required by Johor Port Berhad. Following the principle of ethical sustainability, it considered how the following would benefit and add value to the company:

1. The reduction in the quantity of water used for landscaping
2. The use of rainwater to reduce consumption of potable water
3. The use of rainwater for non-potable functions such as toilet systems

Analysis

Malaysia has an average annual rainfall of 2,500 milimetres, although in 2019 East Malaysia experienced rainfall of 5,080 milimetres; the estimated monthly rainfall across 2019 in Johor Bahru was 2,355 milimetres. However, much of this water is not stored. Between 2005 and 2009 Malaysian water consumption (per capita per day) increased by 7.6 litres and there was no corresponding increase in water reserves. Rainwater harvesting systems can provide a backup water reserve in case of a water supply crisis.

Significant rainfall also increases the risk of flash-flooding. Flooding is the most significant natural hazard in Malaysia in terms of its effect on the population, frequency, area impacted, flood duration and impact on socio-economic life. By capturing rainwater, it is possible to reduce excess rainwater from entering the drainage system and thereby reduce the risk of flooding.

There are increasing demands on the water supply in Johor Port Berhad due to rapid expansion in operations, cleaning, and landscape irrigation. In the first half of 2019, the port's water bill was over 2 million Malaysian ringgits (approximately US$480,000), of which 1.4 million Malaysian ringgits was spent on water for cleaning and irrigation. There is no data for cleaning and irrigation water expenditure before 2019. Thus far the port has installed three rainwater harvesting systems: one at Warehouse 3E (see Figure 29 below) at Johor Port Berhad; another at Terminal 2; and the third at the Customs Building Import/Export facility.

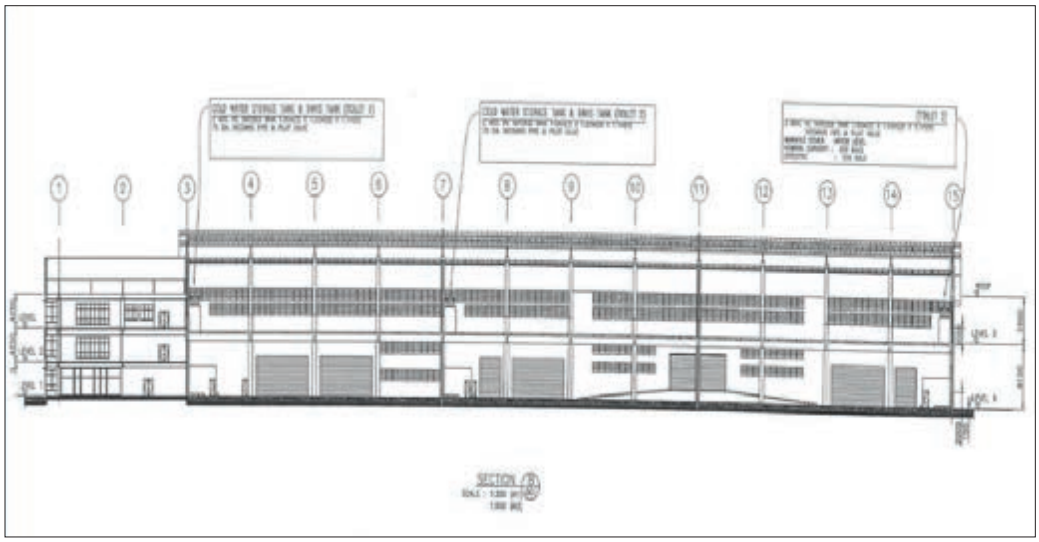


Figure 29: Schematic of RHS implemented in Warehouse 3E

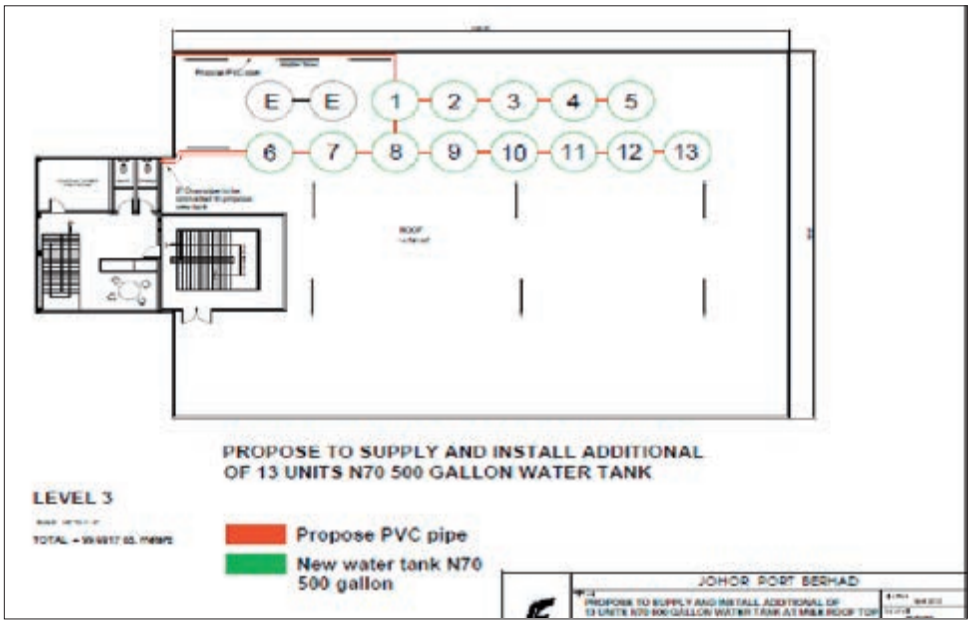


Figure 30: The Marine and Engineering Building, roof area

Analysis suggests that extending the implementation of rain harvesting systems will facilitate landscaping and the maintenance of a higher level of cleanliness within the port. Importantly, it will save scarce supplies of potable fresh water for human consumption. Johor Port Berhad has 35 warehouses of varying sizes. However, engineering surveys found that most were not suitable locations for rainwater harvesting systems, mainly due to operational and safety issues. But two sites were deemed suitable: the rooftops of the Marine and Engineering Building, with an area of 535.21 square metres, and Warehouse JPL F25, with an area of 4,400 square metres. It is estimated that the installation of rainwater harvesting systems in these locations would result in the annual accumulation of approximately 9,870,000 litres of rainwater.

Calculations based on average rainfall data show that the roof area of the Marine and Engineering Building has the potential to deliver more than 1 million litres of water per annum. The second, much larger, warehouse site JPL FZ5, has potential to harvest up

to 9 million litres of rainwater per annum. The total cost for the two systems is estimated to be 80,000 Malaysian ringgits. The estimated cost of fresh water used in 2019 for landscaping and cleaning purposes was 13,640 Malaysian ringgits and without providing for escalation in the price of freshwater charges the expected payback period is just under six years.

The benefits arising from the rainwater harvesting system are not purely financial. There is the beneficial impact on the environment with less flood water as well as compliance with Government policy to be taken into account. Also, other variables must be considered such as, long-term performance of the system, meeting increasing demand for fresh and harvested water and the experience gained from the project design.

Recommendations

This analysis has shown that rainwater harvesting provides a suitable alternative water supply for landscape irrigation and cleaning operations in Johor Port Berhard. Therefore, the authorities should proceed with the project.

The implementation would also mitigate the impact arising from flash flooding in the area and reduce expenditure on water-charges and these factors must be accounted for in the project justification.

The project should be implemented so that the rainwater harvesting system can supply water for non-potable functions such as toilet systems and fire hydrants. This will reduce water charges and save costs for JPB.

It is also recommended that all future port developments must include the installation of rainwater harvesting systems during the design and construction phase rather than retrofitting or refurbishing buildings and warehouses, as this would be more cost-effective.

Sustainable Development Goals

In the 2030 Agenda for Sustainable Development, sustainable transport is mainstreamed across several SDGs and targets. The targets of relevance to this case study and its recommendations are especially those related to:

SDG 6 – Ensure availability and sustainable management of water and sanitation for all

The SDG target 6.4[3] calls for substantially increased water-use efficiency across sectors to address water scarcity and substantially reduce numbers affected by water scarcity. The rainwater harvesting will reduce the demand on the potable water supply by more than 9 million litres annually and encourage a self-sufficient, sustainable management system. The SDG 6 indicator 6.4.1[4] calls for a change in water use efficiency over time. This change is already happening in JPB.

Implementing the recommendations proposed here is also having an impact on reducing CO_2 levels by providing sufficient irrigation water for many thousands of plants and trees that absorb carbon from the atmosphere.

Implementation Update

The Facility Management Department received approval to proceed with the project recommendations in April 2020. Project timelines have been documented and the recommended budget has been approved and signed off by the senior executive team.

[3] By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity.

[4] Change in water-use efficiency over time.

Functions of Human Resource Management that Have the most influence on the Tendency of Employees to Leave an Organization, a Study at Johor Port Berhad

Author of the case study: Mr. Fadzly Izzat Sariff, Manager of Human Resources and Administration, Johor Port Berhad

Mentor: Mr. Haji Othman bin Mohamed, Human Resources Trainer, Johor Port Berhad

Figure 31: Photo of Mr. Fadzly Izzat Sariff (author, left) and Mr. Haji Othman bin Mohamed (mentor, right)

About the author

For over 20 years, Mr. Fadzly Izzat Sariff has been working in the port community of Malaysia. He first started in operations as soon as he graduated with his diploma. However, Mr. Sariff's pursuits in self-development and lifelong learning never stop. While making continuous leaps in his career, he made time for further studies and completed a master's degree in human resources development. Adept at time management and prioritizing, Mr. Sariff graduated from the UNCTAD Port Management Programme among the top three of his class.

The programme was part of Johor Port Berhad's employee development initiative for its potential future leaders. "I was very proud to be part of the programme," replied Mr. Sariff when asked about his experience. Mr. Sariff also explained that the opportunity to join the Port Management Programme was very valuable for him.

> "It was the best moment when I was given the chance to be taught by experts from various backgrounds from other ports around the world. The programme benefited all parties involved. For guest speakers from other ports, they learned different cultures and ways of work. For the participants, we gained new ways of thinking and took part in knowledge sharing. For the company, they obtain well equipped employees and talents."

Mr. Sariff explained that the programme provided the 'values of bringing honesty' to the workplace, meaning that the course encouraged participants to tackle real and practical problems, not a theoretical one. According to Mr. Sariff, this approach brings better performance and positive impact to the port's development overall.

Mr. Sariff purposefully picked the social issue related to manpower, particularly as they relate to staff development and retention, which is directly under his responsibility. Encouragingly, the recommendations of his dissertation are being implemented and evaluated one at a time. Mr. Sariff said, "we are currently working on 'creating an enjoyable culture at work", which is one of the six dimensions he covered in his dissertation.

> "We are working on these, point by point and so far, it has been a good experience. Fortunately, my colleagues welcomed my ideas and we want to tackle the challenges which can have a real impact on our work."

Background

Johor Port opened in 1977. Originally it was a government initiative to reduce dependence on Singapore for the exportation of palm oil. It was incorporated in 1993 and fully privatised in 1995. Johor Port is one of only five Asian ports listed on the London Metal Exchange. The Port provides a variety of services. It is a key driver for growth in Iskander Malaysia and the southern region of Peninsular Malaysia. A total of 1,165 people are employed by the Port.

Introduction

The workforce composition of Johor Port Berhad is made up of 94% permanent employees and 6% contract staff. Support staff make up 74% of the total with the remainder being management. Only 8% of the support workforce are women, whereas 33% of management grades are female. Most staff are in the 30-39 age grouping (see Figure 32 below from Johor Port Berhad Human Resources Report, August 2019).

Johor Port has grown rapidly since its privatization and employee turnover has been high. Data shows that between 2014 and 2017 turnover increased from

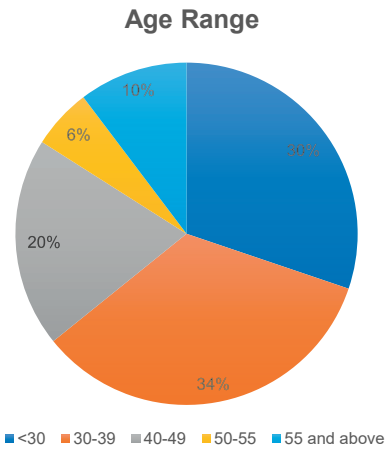


Figure 32: Relative ages in the workforce at Johor Port

2.2% to 4%, although it was only 2.35% in 2018. Overtime payments have increased as a result of the turnover experienced because the remaining staff must work longer hours to compensate for fewer staff numbers. This has a direct impact on the cost of JPB operations.

A comprehensive review of human resources management theory indicates the key importance of successful human resource management. The objective of this case study is to identify which functions of human resource management have the most influence on the tendency of employees to resign and leave the Johor Port Berhad organization. Figure 33 lists the human resources functions which were considered in this case study.

Six human resources functions which influence tendency to resign
1. Talent Acquisition: recruiting the right people for the right job/ function
2. Corporate Culture: the attitudes, beliefs and values of an organisation
3. Motivation: the initiation, direction, intensity and persistence of behaviour
4. Training and Career Development: provides employees with information and relevant skills
5. Performance Management: systematically evaluating performance and providing feedback
6. Reward and Compensation: salary and annual bonuses

Figure 33: Six human resources functions which influence tendency to resign

Ensuring talented employees want to remain with Johor Port Berhard will support the goal of becoming the most efficient and integrated multi-purpose port in the region. The five core values of JPB culture are Operative Efficiency, Uncompromising Integrity, Customer Excellence, Sustainable Development and People Involvement.

Analysis

In 2018 and 2019, employees who resigned were required to sit an exit interview. An analysis of the responses found that 68% resigned because they had been offered a better salary elsewhere. This was followed by leaving to complete further study (12.5%). Only 3.6% resigned due to shift patterns. The highest turnover was among support employees. Of the 86 employees who resigned between January 2016 and August 2019, 41 were operations assistants (48%). Figure 34 below presents the results of exit interviews.

Reasons for leaving	Percentage
Better salary	67.9%
Family matter	5.4%
Run own business	8.9%
Further study	12.5%
Enter government sector	1.8%
Shift pattern	3.6%

Figure 34: Exit interview results

As part of this case study, 103 support level employees, 77 men and 26 women, from the Container, Bulk and Break Bulk, and Port Security and Safety departments were surveyed. The majority (54.4%) were aged 21-30 years old, and 35.9% were aged between 31-40 years. Most were educated to secondary level – the Malaysian Certificate of Education (Sijil Pelajaran Malaysia) – and had been employed by JPB between one and three years. However, 24.3% of respondents had been with JPB for over 10 years.

The survey found that workers aged 21-30 who had been with the Port less than three years were more likely to leave the organization. This may be because they are younger with less financial commitments. By contrast, employees who were aged 41-50 were less likely to leave.

The survey found that employees in the Container department were more likely to leave than those in the Bulk and Break Bulk, and the Port Security and Safety departments. This corroborated previous data which showed that the Operations Assistants had the highest turnover. These employees mostly work at wharf areas and onboard vessels; it is a hostile work environment with potentially unsafe and unsanitary working conditions.

The analysis explored how employees felt about the six human resources functions which have most influence on an employee's tendency to resign. The analysis is based on a standard 5-point Likert Scale with an average score calculated to indicate the level of satisfaction/dissatisfaction of the respondents.

Survey Results

The human resources management function with the greatest influence on employee retention was talent acquisition. There was a significant relationship between talent acquisition and employee turnover because talented employees perform well and contribute to the organization. However, underperforming employees are more likely to leave. The least influential function was reward and compensation.

The summary findings from the survey are presented in Figure 35 below.

No.	Functions	Average Mean Score
1	Talent acquisition	3.65
2	Motivation	3.51
3	Corporate culture	3.35
4	Training and career development	3.33
5	Performance management	3.24
6	Reward and compensation	2.75

Figure 35: Human resources functions ranked in order of influence on employees to remain with Johor Port Berhad

Recommendations

Through the analysis of the 103 surveys, the following recommendations can be made for the improvement of human resource management at Johor Port Berhard.

The first recommendation is that the department of Human Resources and Administration should review its employee selection process to ensure that it is in-line with JPB's Talent Acquisition Strategy. The goal is to effectively source, attract, select, train, develop, retain, promote, and move employees through the organization for the duration of their career. The talent acquisition strategy includes comprehensive job descriptions, use of competency-based interviews to fill positions and complete background checks on potential employees. On-boarding programmes should also be brought in to help new staff acclimatize to the behaviour and culture of JPB.

Secondly, line managers and supervisors need to become proactive in mentoring new employees and in ensuring that fair play and non-discrimination applies in the workplace.

Thirdly, most surveys consistently indicated that increased efforts in career development can significantly increase employee retention. In order to meet this objective, the following initiatives should be implemented:

1. Competency Framework
2. Learning and Development Framework
3. Succession Planning and Talent Management Programmes
4. Individual Development Plans
5. Level 2 and Level 3 Training Evaluations

Fourthly, overall, organizational career development and planning efforts should be designed to meet employee expectations and offer opportunities to enhance career growth. These initiatives, coupled with investment in both monetary and non-monetary rewards and compensation will reduce employee turnover, retain existing staff and lead to an increase in productivity.

Implementation Update

At the time of writing this publication, several of Mr. Sariff's recommendations are already in the process of being implemented, as follows:

Talent Acquisition

Human Resources have started using the Competency-Based Interviewing (CBI) approach across all recruitment processes for both management and support group positions. The process started

Talent acquisition	Re-visit selection process
Corporate culture	• Transparency in policies and regulations • Reduce office politics/cronyism • Provide better facilities
Motivation	• Appreciation from management for job well done • Building trust among employees
Training & career development	• Structured carrer path • More training related to employee competencies
Performance management	• Fair and transparent career enhancement based on performance management system
Reward & compensation	• Provide allowances e.g. housing, transport, etc. • Improve fringe benefits to employees

Figure 36: Table of recommendations based on survey results

with strengthening the interview process by developing a structured set of questions focusing on a candidate's past behaviour and accomplishments. The main purpose is to get the interview board's best recommendation to select the right candidates in line with the competencies set for the positions. During the interview, more time is allotted for the interviewer to ask competency-based questions. This is part of the re-visit process recommended and it is expected to deliver a more thorough selection process.

Training and Career Development

As part of to the process designed to improve training outcomes, a focus is now placed on competency-based training. Several initiatives have been approved and are currently on-going. For example, a Competency Framework has been developed based on Core Skills, Leadership and Functional competencies. It is aimed at updating skills and knowledge of employees in areas of immediate impact to their job scope. For instance, all Operational Assistants from Container and Bulk and Break Bulk departments must undergo a functional training programme called Basic Port Operation programme over ten consecutive days prior to deployment for operations.

Finally, from this year, the Human Resources department will initiate the new Individual Development Plan (IDP) to obtain a full specification for each employee of their development needs. Based on the overall gaps identified, a comprehensive competency-based training plan will be developed and reviewed annually.

The Effectiveness of Vessel Traffic Service in Johor Port Authority's Port Limits

Author of the case study: Ms. Norzie Hasnira Binti Ramlan, Marine Manager - Marine & VTMS Department, Johor Port Authority

Figure 37: Photo of Ms. Norzie Hasnira Binti Ramlan (author)

Mentor: Mr. Fuad bin Hj Naemoon, Senior Marine Manager, Johor Port Authority

Figure 38: Photo of Mr. Fuad bin Hj Naemoon (mentor)

About the author

"Maritime transport is a global issue. I've been with the industry during the last twelve years, but I realize I always need to keep up-to-date and increase my knowledge", said Ms. Norzie Hasnira Binti Ramlan. She indeed practices what she preaches. In the beginning of her career, Ms. Ramlan started working at Johor Port Authority almost right after she graduated with a Bachelor of Management in Maritime. After ten years at the port, Ms. Ramlan took some time off to pursue her Master of Science in Transportation Planning and eventually received a full scholarship for her continuing education. Returning to her work, Ms. Ramlan then signed up for the Modern Port Management course.

> "I believe in continuous learning and my passion for gaining new knowledge motivated me to participate in this programme. I have many valuable memories that, to this day, drive me to be a better employee especially on how to manage my daily schedule, teamwork, commitment and manage conflicts. The UNCTAD Port Management Programme added value to my knowledge, confidence, and creative freedom. I gained a lot of experience during this training that allows me to acquire new skills, sharpen knowledge, perform better and be a better leader."

Ms. Ramlan emphasised the practicality of the UNCTAD programme as one of the most unique characters of the training programme.

> "From this programme, I know my work better, as well as my strengths and weaknesses. It is not an academically focused programme -- it focuses on actual real-world cases. The port community needs competent personnel to do the work and this programme enables me and my colleagues to contribute as a practitioner."

As a matter of fact, the implementation of Ms. Ramlan's dissertation will begin its implementation in 2021 for the period of eighteen months.

> "The inputs and recommendations which I shared in my dissertation have been approved by Management of Johor Port Authority and currently we are preparing to start the collaboration project with other ports."

Ms. Ramlan also expressed her appreciation of the UNCTAD programme in actively encouraging female participants to take part.

> "When looking at the SDGs, empowering women is a must. I believe that our Management is very open to the issue of gender equality and the UNCTAD programme gives women at the port a concrete chance to work on key challenges."

In concluding her remarks Ms. Ramlan declared: "give us opportunities – we can deliver".

Background

The International Convention for the Safety of Life at Sea 1974 (SOLAS) provided standard guidelines for enhancing maritime security. Later, in 2016, the International Maritime Organization (IMO) required ports to develop regulations and guidelines to manage and mitigate any threats to maritime security and safety. The Vessel Traffic Service (VTS) was designed to improve the safety and efficiency of vessel traffic and protect the environment. The main purpose of the VTS is to provide active monitoring and navigational advice for vessels in busy waterways. It provides valuable surveillance information for port-ship interface

operations. Furthermore, VTS with advanced systems can extend efficient control on marine pollution and provide analysis of collision and navigation conflicts.

Introduction

This case study explored the effectiveness of the Johor Port Authority's implementation of its VTS system. Currently the VTS manages between 50 and 100 ship calls per day. This is expected to increase annually by 5%. Two ports in this area that operate VTS have been examined: Tanjung Pelepas Port and Pasir Gudang Port Johor.

Within the area covered by the JPA's VTS, there is a plan to construct the Pengerang Integrated Petroleum Complex (PIPC) by 2037. This will potentially increase the level of vessel traffic to over 13,000 ship calls annually. It will also require an increase in other marine activities such as dredging, installation of offshore rigs, and land reclamation. The importance of VTS to port operations in the next five to ten years cannot be overstated, particularly in assisting the safe movement of vessels and minimizing accidents at sea. Figure 39 below shows major developments planned for Pengerang.

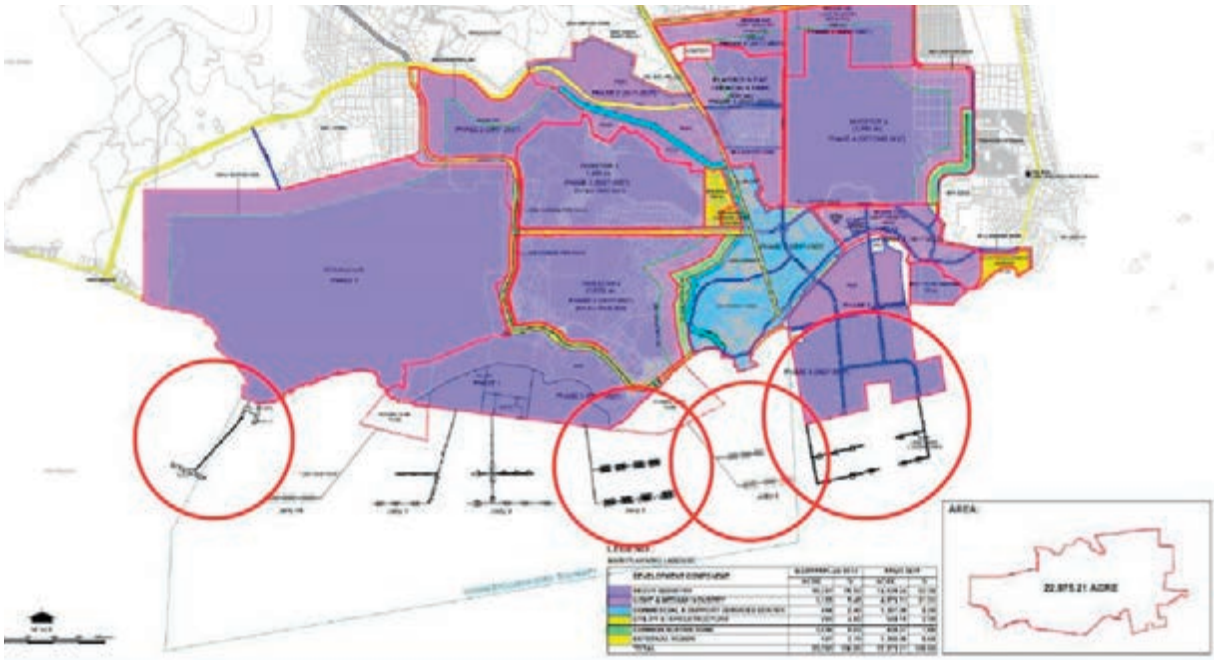


Figure 39: Expansion plans for Pengerang area

No.	VTS Technical Standards Key Element
1	Radar
2	Automatic Identification System (AIS)
3	Radio communications
4	Hydrological and meteorological equipment
5	Closed Circuit TV (CCTV)

Figure 40: The five main components of the Vessel Traffic Service (VTS) Guideline by Malaysian ports

The scope of this case study is to examine and measure management and technical standards of the VTS system and to identify and recommend improvement actions. There are limitations, both technical and systems-wise, which prevent monitoring of the whole area of water under the control of JPA. It is imperative that the key issues and challenges affecting the implementation of VTS are identified and addressed as early as possible. For example, the limitations of radar, closed circuit television (CCTV) and radio signals prevent coverage of some areas known as blind spots. This study identifies the challenges to full VTS implementation and considers options for improving the current system. Inputs to the research included site visits to VTS facilities operated by the JPA to observe operations and to measure technical standards.

Analysis

The initial stage looked at best practice for VTS models in Singapore and Rotterdam ports. The criteria assessed in the world-leading ports were then used to compare the situation in JPA. Currently the ports of Tanjung Pelepas and Pasir Gudang operate independent VTS systems. The Johor Port Authority does not centralise its VTS activities nor is there any integration of data between ports and terminals. VTS information is not always reliable. Furthermore, there are no formal guidelines or instructions for best VTS practice.

The research phase of the study examined four VTS facilities with operational areas of between 20-40 nautical miles namely:

1. Johor Port Authority/Johor Port Berhad
2. Marine Department Southern Region
3. Pengerang Marine Operations Sdn Bhd (MOSB Pengerang)
4. Johor Port Authority/Port of Tanjung Pelepas

Survey results showed that around 80% of VTS system guidelines have been met and the main findings were:

- Radar: The minimum measurement target for reflection is 20 nautical miles. Two facilities were found to surpass minimum standards while two facilities did not meet minimum standards.
- Automatic Identification System (AIS): all facilities complied with international AIS standards.
- Radio Telecommunication: the minimum criteria are that the port facilities have communications with ships, with government related security organizations and with relevant stations in the port area. All four facilities meet these communications requirements.

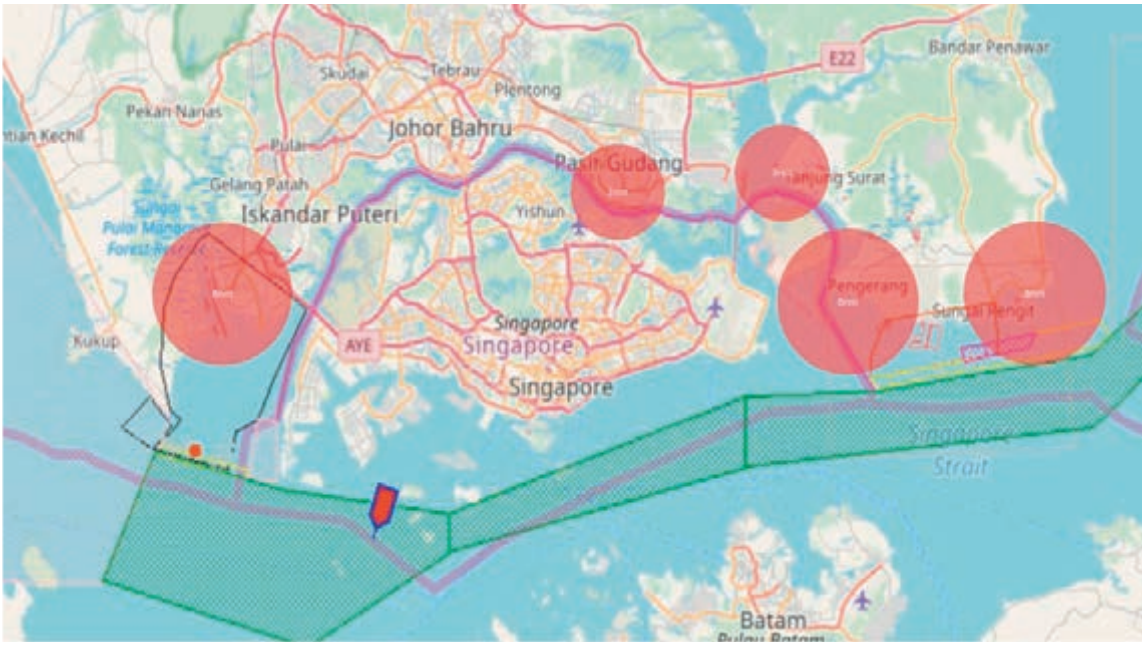


Figure 41: CCTV blind spots in the PTP sea area and Pasir Guadang limits

- Meteorological and Hydrological Equipment: relevant equipment is required to be installed at terminals and buoys in the operational area. Only three agencies met the minimum standards.
- CCTV: only three facilities have installed CCTV and the range is limited. This causes blind spots as indicated below.
- Power Supply: a suitable power supply, with emergency function, is needed to ensure that critical security equipment can always operate. All facilities were compliant.

All VTS facility operators interviewed agreed that VTS was a positive contributor to safety and security at sea. However, it was noted that that JPA's VTS was not always working due to maintenance and a lack of system networks.

Recommendations

1. The coverage area of each VTS facility should be properly designated based on consideration of port facility arrangements, berthing conditions, loading/unloading of cargo, embarkation/ disembarkation of passengers.
2. The current VTS equipment should be upgraded to overcome shortcomings which limit its coverage and reduce performance.
3. The radar system should be designed with defined radar accuracy. In measuring long distances, the impact of the height and type of antenna on measuring accuracy and resolution should be considered. The system should also be capable of displaying and tracking all target interests simultaneously without the need for manual adjustments by operators.
4. Currently the facilities surveyed use an AIS base station owned by the Marine department and refer to other internet sources such as AISLive for reference. This means that the data received is limited and not wholly accurate. It is advised that that the JPA install its own AIS base station to avoid interruption of data. This will allow the AIS service to provide timely, relevant and accurate information to support the decision making in VTS.
5. All facilities agreed that the systems under different ownership should be integrated to improve services and ensure there are no gaps in area coverage. The survey also revealed that operators believe long-range CCTV improved radar scanning equipment and that oil spill sensors will assist in VTS monitoring of port areas.

Sustainable Development Goals

In the 2030 Agenda for Sustainable Development, sustainable transport is mainstreamed across several SDGs and targets. The targets of relevance to this case study and its recommendations are especially those related to:

SDG 9 – Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

Efficient transportation services are key drivers of economic development, and maritime transport is a critical enabler of trade. Increasing the reliability of VTS systems within the area controlled by Johor Port Authority will ensure that the port has the technical infrastructure to grow capacity in a safe and secure manner. The proposed state-of-the-art VTS which operates on a 24 hours a day basis with minimal gaps in coverage protects against vessel accidents and prevents pollutants entering the sea thus potentially saving human lives and the lives of birds and marine life.

C. THE PHILIPPINES

Statement of Mr. Jay Daniel R. Santiago, General Manager, Philippine Port Authority

Figure 42: Photo of Mr. Jay Daniel R. Santiago, General Manager, Philippine Port Authority

"Ports are the country's economic lungs. The progress of its nation is highly dependent on the efficiency of the ports. This is the reason why the Philippine Ports Authority (PPA) is driven by its vision to provide excellence in port services and operations and has set its lense towards continuous and progressive development in port management.

The UNCTAD TrainforTrade Port Management Programme has been an essential tool towards this end as it provides the necessary knowledge and expertise to the people in the country's port industry thereby raising their competence, improve productivity satisfaction and nurture a positive work environment.

Significantly, this UNCTAD programme has provided PPA, the opportunity to establish a mutually beneficial and fair relationship with our port industry partners, not to mention the participation of some government agencies but more importantly our cargo handling operators around the Philippines in its successful conduct from Cycle 1 to Cycle 3.

Indeed, the sharing of knowledge and expertise between participants from our cargo handling operators and selected personnel of the Philippine Ports Authority has strengthened the cooperation among the port stakeholders in our country. The Modern Port Management course has been a good platform for the UNCTAD participants to acquire vast knowledge and experience from international trade & transport, the organization of a port system, the functioning of a port system, the future challenges to ports, the methods & tools of modern port management, the commercial & economic management of a port, the administrative & legal management of ports, and the technical management and human resource development. The learnings have been rolled into one – the development of a Dissertation Paper that is of relevant to their respective offices.

It is noteworthy that graduates of this programme from the Philippine Ports Authority, from our cargo handling operators and from our partner government agencies, have become the local trainers as we expand and grow together with the experts from English-speaking countries."

Overview of the Philippine Ports Authority[5]

Our History

Prior to the creation of Philippine Ports Authority (PPA), port administration in the Philippines was merged with the traditional function of revenue collection of the Bureau of Customs (BOC). Port and harbor maintenance was the responsibility of the Bureau of Public Works (BPW). In the early 1970's, there were already 591 national and municipal ports plus 200 private ports scattered all over the country necessitating the need for long-range planning and rationalization of port development.

There was an identified need to integrate and coordinate port planning, development, operations and regulation at the national level. Around this time, the Bureau of Customs had proposed to the Reorganization Committee and to Congress the creation of a separate government agency to integrate the functions of port operations, cargo handling and port development and maintenance to enable the Bureau to concentrate on tax and customs duties collection. Moreover, the World Bank, as a condition for the grant of a port development loan in 1973, stipulated the creation of a port authority to oversee the implementation of projects under that loan.

[5] Section provided by the Philippine Port Authority.

Realizing that the establishment and operation of port authorities in other countries led to improved port operations, it was felt that the same benefits could be derived with a national port authority to administer and manage the country's ports. Hence, the Philippine Ports Authority was created under Presidential Decree No. 505 which was subsequently amended by P.D. No. 857 in December 1975. The latter decree broadened the scope and functions of the 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 the salient features of which were the granting of police authority to the PPA, the creation of a National Ports Advisory Council (NPAC) to strengthen cooperation between the government and the private sector, and the empowering of the Authority to exact reasonable administrative fines for specific violations of its rules and regulations. By virtue of its charter, the PPA was attached to what was then the Ministry of Public Works and Highways (MPWH) which also served as the executing agency for all port construction projects. Under this set-up, PPA prepared the general plans, programmes and project priorities while the MPWH was responsible for detailed engineering, actual construction and/or supervision of port construction projects

The PPA was subsequently removed from under the jurisdiction of the MPWH (DPWH) and attached to what is now the Department of Transportation and Communications (DOTC) for policy and programme coordination. Subsequently, by virtue of Executive Order No. 159, which was issued in 1987, the PPA is now vested with the function of undertaking all port construction projects under its port system, relieving DPWH of this responsibility. The executive order also granted PPA financial autonomy.

Our Mission, Vision, Mandate and Core Values

(new mission and vision statements, mandate and core value statements are now undergoing approval with proper authorities)

Mission

1. Provide reliable and responsive services in ports, sustain development of communities and the environment, and be a model agency of the government.
2. Establish a mutually beneficial, equitable and fair relationship with partners and service providers.
3. Provide meaningful and gainful employment while creating a nurturing environment that promotes continues learning and improvement.
4. Establish a world-class port operation that is globally competitive adding value to the country's image and reputation.

Vision - "By 2020, PPA shall have provided port services of global standards."

Mandate - "to establish, develop, regulate, manage and operate a rationalized national port system and national development".

Core Values

E - Excellence, Professionalism and Efficiency

C – Customer Satisfaction, Customer Focus

R – Responsible Citizenship, Sustainability, Accountability, Risk Management

E – Ethics. Integrity with moral bounds

S – Sincerity. Commitment to fulfill mandate

T – Teamwork. Synergy of working together with Esprit de corps

Our Organizational Structure, Executive Management and Staffing

In terms of structure, PPA is composed of a Head Offices situated in Manila and 25 Port Management Offices (PMOs) and Terminal Management Offices (TMOs) strategically located in Luzon, Visayas and Mindanao areas in the Philippines. Presently, our executive management is composed of:

- Atty. Jay Daniel R. Santiago – General Manager
- Hector E. Miole – Assistant General Manager for Operations
- Engr. Constante T. Farinas – Assistant General Manager for Engineering
- Atty. Elmer Nonnatus A. Cadano – Assistant General Manager for Finance and Administration

Presently, PPA has a total regular plantilla positions of 3,151 as approved by the Governance Commission for GOCCs.

Our Shipping and Trade Performance (culled from 2018 Annual Report posted in website)

In terms of shipping and trade performance, PPA has posted an increase in cargo throughput, container throughput and shipcalls, passenger traffic and cruise passenger traffic, to wit:

- Cargo Throughput – 260.953 MMTs, up by 2.92%
- Container Throughput – 7.573M TEUs, up by 7.96%
- Shipcalls – 468,439, up by 4.33%
- Passenger Trafffic – 76.798 M, up by 6.02%
- Cruise Passenger Traffic – 451,063, up by 308.06%

For further information on Philippine Ports Authority, please visit our website at www.ppa.com.ph.

The need to use Automatic Spreaders to Improve Service Efficiency of the Handling Operation for Self-Sustaining Vessels at Manila North Harbour

Author of the case study: Ms. Rhona Rey C. Santos, Business Analyst, DP World Asia Holdings Ltd

Figure 43: Photo of Ms. Rhona Rey C. Santos (author)

Mentor: Mr. Henry Rophen B. Virola, Vice President, Oceanic Container Lines

Figure 44: Photo of Mr. Henry Rophen B. Virola (mentor)

About the author

Ms. Rhona Rey C. Santos was enrolled in the UNCTAD Modern Port Management training when she was working at Manila North Harbour Port Inc. in Manila, Philippines as Operations Shift Manager and took her last role as Head of Gate Operations before she left the company in October 2019. Currently Ms. Santos is based in Hong Kong.

Being a part of the Operations Division, Ms. Santos was very much motivated to learn how she can further improve the way of work to make it more efficient, effective, and safer for everybody in the port. She explained that she was excited to join the UNCTAD programme.

> "I wanted to learn how port communities are getting connected and how it affects global maritime trade collectively. Little did I know that port operations are only a fraction of what the UNCTAD programme is about. The UNCTAD Port Management Programme gave me a holistic understanding and appreciation of what port management really is, and it was made possible through the knowledge transfer coming from the expertise of the trainers and the comprehensive modules we used. My most memorable moment during the programme would be the dissertation and the panel defense since it enabled me to apply what I have learnt and gave me a chance to contribute to my organization.
>
> The programme gave me a great appreciation and respect for the hard work done by UNCTAD and all the people of port communities and organizations behind this programme -- for documenting all these best practices and creating this network across the world. Coming from a developing country, everything that I have learned from this programme is significant and substantial not only for my organization but for the whole country since the benefit of improving trade affects the whole supply chain entirely. This programme gave us a canvas to paint strategic plans to develop Philippine ports, working at a standard, if not at par, to developed ports from other countries."

The recommendations from Ms. Santos dissertation presented below have been discussed and acted on by North Port Operations Management. The maintenance schedule for the automatic spreaders was created and applied. Although Ms. Santos is no longer working at North Port, her proposals continue to prove useful for her former organization. In 2020, the in-house crane operator training based on the proposed training course outline is being planned for the port.

> "Personally, this programme allowed me to confidently go out of my comfort zone and gave me a 'voice'. As with my current role, I am involved in executing ICT projects in ports hence I was able to practice technological innovation management which I have learned from the programme. Attending the programme was an experience of a lifetime. I am privileged and humbled to see, to feel and to learn first-hand from the expertise of the trainers. I believe that knowledge is not meant to be stored but rather to be used to encourage and empower others. I hope to pass and cultivate this knowledge to the next generation of future managers."

Background

Manila Port Harbour Incorporated (MNHPI) was established in April 2010 and has become a major player in the development of domestic maritime trade within the Philippines. MNHPI caters to domestic shipping by providing manpower and equipment support for both seaside and landside operations. Situated on a 52.5-hectare site, it has 46 berths handling containerized and non-containerized cargo from domestic vessels.

Since operations began, container volume throughput has increased by 93%, with an annual growth rate of 12% between 2010-2016; it now handles 99% of domestic containerized shipping. Breakbulk cargo throughput was 1.85m tonnes in 2016 comprising mainly iron and steel products, as well as rolling and general cargoes. The port employs 1,885 people, of which approximately 42% are dockworkers involved in cargo operations. Recently, the company has heavily invested in the upgrading of its Terminal Operating System (TOS) through a partnership with the global TOS leader NAVIS N4 to facilitate fast and reliable communication.

Introduction

Port efficiency is determined by both the cost of transit and the service quality needs of customers. Vessel size is increasing leading to greater demands on ports for deeper berths and more efficient cargo handling. Spending less time at port facilitates a reduction in ship operating costs and this provides a competitive advantage for some ports over others. Estimates from MNPHI show that the handling fee for one TEU is 52% of the total incurred port cost.

This study argues that improving efficiency in port operations, especially cargo handling operations, leads to a reduction in port costs, as well as a decrease in downtime caused by injuries to workers. Replacing the traditional wire sling and hook method for handling containers with automatic spreaders will reduce accidents and increase productivity according to the research. This will most likely lead to an increase in customer support for the use of automatic spreaders. This study has focused only on Lift-on/Lift-Off (LOLO) operations and has compared the onboard cycle time for both wire-sling and automatic spreader operations through random sampling. A total of 480 crane cycles were observed on site.

Assumptions made to facilitate the fieldwork were, the crane capability (speed) and competence of the crane operator are taken as a constant through the study, and each container is assumed to be uniform in weight and design.

Analysis

Over the years land has been reclaimed for more berths and the terminal operating system has been heavily invested in. However, the wire-sling method for handling cargo, including containers, is still widely used. Figure 45 shows very little improvement in gross crane handling productivity for the period 2011 to 2015. This impacts on berth efficiency and, by requiring vessels to stay longer in port, means that the ship and cargo owners incur costs which inevitably get passed on to consumers.

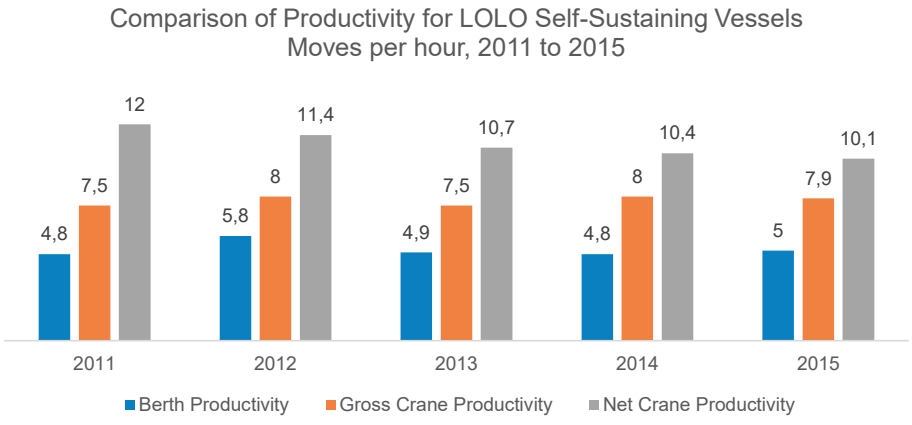


Figure 45: Berth and crane productivity – 2011 to 2015

In the wire-sling method, on-board stevedores are required to climb a container to latch/unlatch the wire slings on the container corner castings to secure it for take-on and lifting from/to the vessel. This method of container handling is hazardous for workers as they can get hit by objects caught in the slings/hooks, be injured by protruding sling wires or by tripping and falling off a container. Between 2012 and 2015, 80% of injuries sustained in port operations were due to wire-sling operations. Accidents result in loss of productivity not to mention incapacity of workers or in some cases fatalities.

Figure 46: Dockworker preparing to hook the wire sling onto a flatrack

An automatic spreader is used in crane cargo handling. The gear allows unassisted locking and unlocking of hooks to containers. This is faster and safer when compared to the conventional lashing/unlashing utilized in the wire sling method. Furthermore, the use of automatic container spreaders in ports is promoted by the International Labour Organization. Automatic spreaders were acquired by MNHPI in 2015 but thus far the gear has only been deployed 38% of the time as customers and staff may be still wary of such a cargo-handling method.

An analysis of discharging operations found that the total duration for discharge was faster than loading operations. This was especially true when automatic spreaders were used. The average time for standard discharging operations was 4.92 minutes but this was reduced to 2.59 minutes with an automatic spreader, equivalent to a worktime saving of 47%. A similar result was observed for loading operations.

For discharging operations using an automatic spreader, the total cycle duration of 2.59 minutes corresponds to 23 moves per hour. This shows that crane productivity was significantly higher by 8% for loading and 92% for unloading operations than conventional wire slings, which only yielded 12 moves per hour for both operations.

Standard time (in sec)	Tackle with Wire Sling					
Operation	**Taking on**	**Turning when loaded**	**Landing**	**Return empty**	**Total cycle duration (in min)**	**Crane productivity**
Discharging	16.22	169.40	13.00	96.43	**4.92**	**12.00**
Loading	12.15	170.83	35.07	75.29	**4.89**	**12.00**
Standard time (in sec)	**Tackle with Automatic Spreader**					
Operation	**Taking on**	**Turning when loaded**	**Landing**	**Return empty**	**Total cycle duration (in min)**	**Crane productivity**
Discharging	42.53	64.49	6.25	42.30	**2.59**	**23.00**
Loading	29.54	157.95	10.62	83.13	**4.69**	**13.00**

Figure 47: Total cycle duration (in minutes) and crane productivity (boxes/hour) for discharging and loading operation with wire

For a hypothetical volume exchange of 300/240 (inbound/outbound) TEUs, assuming one gang deployed for a 12-hour shift, a vessel crane set-up with wire sling can finish the discharging operations in 25 hours and the loading operations at 20 hours. With automatic spreaders the same throughput can be finished in 13 hours and 18 hours, respectively. The same volume was handled in less than three work shifts, equivalent to a 31% reduction (14 hours) in berth occupancy. Additionally, the use of automatic spreaders increased throughput by 45%.

The next chart below in Figure 48 identifies the causes of occupational accidents and shows the number of incidents recorded in the period 2012 to 2015. The research showed that 80% of workplace accidents where dock workers were injured involved wire-sling operations. The main cause at 39% is when workers are struck by an object while working with wire-sling gear. Next highest is 17% arising from workers getting caught in the tackle. Slipping or tripping at 12% and falling from a height at 11% make up the rest.

However, following the increase in automatic spreader usage the accident data shows much fewer accidents in 2016 – 2017. There was an 83% decrease in workers being struck by an object, and a 90% reduction in injuries from being caught-up in tackle.

The number of injuries incurred from falling from containers also reduced.

The study calculated an economic payback period to the business in less than one year with on-going savings of almost PHP60 million per annum thereafter. Savings arise from reduced gang size and less accidents.

Recommendations

1. Make the switch to automatic spreaders to facilitate continuous operations with significant savings.
2. Put workers welfare first by reducing the use of wire sling operations wherever possible.
3. Introduce continuous training for port operatives to maximise their handling skills, increase productivity and reduce accidents and near misses.
4. Revise maintenance processes to ensure equipment is serviced regularly to improve availability and reduce downtime.

Sustainable Development Goals

In the 2030 Agenda for Sustainable Development, sustainable transport is mainstreamed across several SDGs and targets. The targets of relevance to recommendations made in this study are:

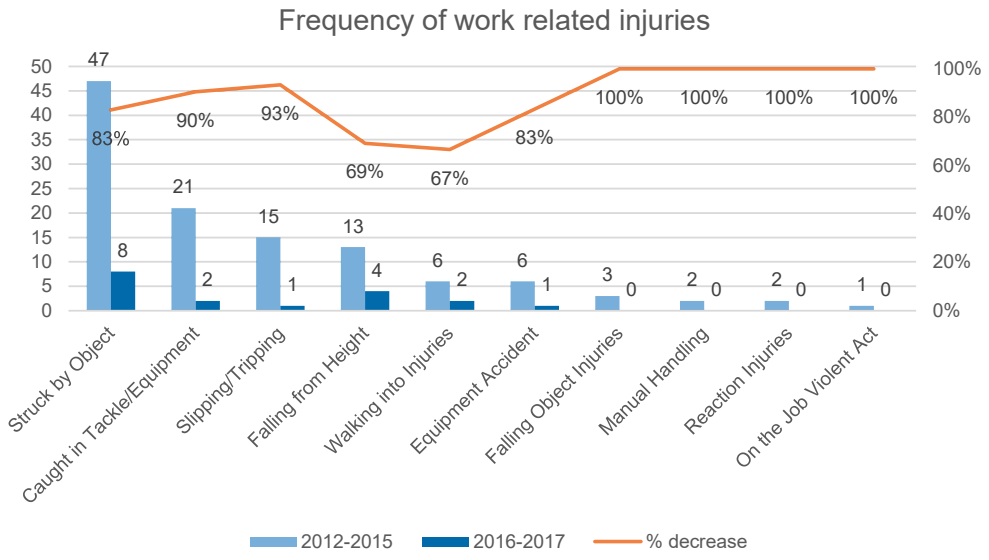
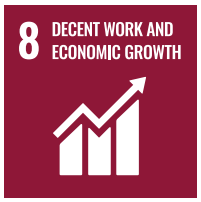


Figure 48: Pareto diagram for the frequency of work-related injuries – 2012 to 2017



SDG 8 – Promote sustained, inclusive, and sustainable economic growth, full and productive employment and decent work for all

The case study demonstrates the introduction of automatic spreaders will save lives and significantly reduce non-fatal accidents among dock workers. The improvement of the health and safety of workers is a key a key target of SDG 8 for "workers exposed to undue risks". Additionally, by providing specialist training for operatives, their skills and safety consciousness will increase and thereby improve their opportunities to benefit from better economic conditions along with the business.

SDG 9 – Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

SDG 9 is met using automatic spreaders which allow more efficient and productive loading/unloading of domestic containers.

Environmental Management System as Performance Measure for the Philippine Port Authority

Author of the case study: Mr. Fernando B. Mapalo Jr., Administrative Officer IV - Port Management Office, Philippine Ports Authority

Figure 49: Photo of Mr. Fernando B. Mapalo Jr. (author)

Mentor: Ms. Lilian T. Javier, Department Manager, Port Operations and Services Department (retired), Philippine Port Authority

Figure 50: Photo of Ms. Lilian T. Javier (mentor)

About the Author

When asked what motivated him to apply for the programme, Mr. Fernando B. Mapalo Jr. explained that he wanted to learn more about the best practices in port communities around the world.

> "I knew that the UNCTAD training could offer a lot in terms of the learnings I specifically would like to get, having participated in another UNCTAD training programme, the Port Performance Scorecard (PPS) before. In fact, my dissertation was much influenced by the idea of a port performance scorecard and measure."

The PMP had a particular personal resonance for him as he explained:

> "The Modern Port Management journey was very memorable for me because my mother passed away in June 2017, just months away before the completion of the programme. My mother was very supportive of me during the training programme and she was my inspiration to do good in the programme. The programme enabled me to have a holistic view and perspective in dealing with challenging issues and in coming up with solutions or recommendations for the continual improvement of the port where I belong and in collaborating with the Head Office in discipline areas where my inputs are required or being sought."

Prior to Mr. Mapalo's dissertation work, environmental policies and regulations among the ports were fragmented. He was determined to consolidate them and improve the port impact to the environment. Among the recommendations in his dissertation is the adoption of a port environmental policy, where all environmental activities and strategies in the Philippine Port Authority (PPA) shall be anchored. PPA Management adopted the recommendation in May 2018 and issued PPA Administrative Order No.05-2018, otherwise known as 'the Port Environmental Policy'. Mr. Mapolo concluded by saying:

> "The course inspired me to come up with something. I used the course's 'score cards' for measuring many aspects of PPA. Seeing the results, for me, I felt that the issue of climate change and environment, particularly port impact to the environment was extremely crucial. We have a big impact through our work, so it is our responsibility to mitigate these impacts to the environment. What we do should be sustainable."

Background

The Port Management Office of South Cotabato, Sarangani and General Santos (PMO-SOCSARGEN) is a field office of the Philippine Ports Authority. PMO-SOCSARGEN was established originally as a port management unit for the Port of General Santos, commonly known as Makar Wharf, and one of the pioneering ports constructed after the creation of the Philippine Ports Authority (PPA) in the 1970s. PMO-SOCSARGEN is located at the Port of General Santos, which is a multipurpose port catering to a variety of cargoes and considered one of the major gateway ports in the Philippines.

Introduction

In recent years environmental issues have been a growing concern for ports. The *Declaration of*

Rio de Janeiro on Environment and Development (1992) emphasised the need for sustainability and for environmental protection. The *European Seaport Organization (ESPO) Green Guide Towards Excellence in Port Environmental Management and Sustainability* was adopted in June 2012. Within this guide is a framework outlining how authorities can respond to environmental challenges under the 5Es:

- Exemplifying: setting a good example towards the wider port community by demonstrating excellence in managing the environmental performance of their own operations, equipment, and assets.
- Enabling: providing the operational and infrastructural conditions within the port area that facilitate port users and enhance improved environmental performance within the port area.
- Encouraging: providing incentives to port users that encourage a change of behaviour and induce them to continuously improve their environmental performance.
- Engaging: with port users and/or competent authorities sharing knowledge, means and skills towards joint projects targeting environmental improvement in the port area and the logistics chain.
- Enforcing: making use of mechanisms that enforce good environmental behaviour by port users where applicable and ensuring compliance.

The aim of this case study was to investigate the primary mechanisms used to measure and manage environmental performance in PPA ports. Over the years, PPA has implemented numerous environmental programmes on its own initiative and in collaboration with other organizations. However, PPA has no systematic process in place to measure environmental performance. Only traditional port performance measures are readily available, with limited data related to environmental matters. There is little published information on port environmental performance from PPA ports that can be used for sustainable management. For this study, twenty-five PPA designated environmental specialists were surveyed via email.

This case study is significant as it highlights the dearth of published data in the Philippines on environmental performance of ports. It is necessary to improve the availability of port environmental performance data as this forms the baseline from which the PPA can formulate and implement institutional approaches to improved environmental performance. This will also enable proactive responses to the challenges posed by climate change and bring about more sustainable management within the maritime sector.

Analysis

It is challenging to develop a port performance assessment in the Philippines due to the number of parameters involved as well as the lack of up-to-date reliable data. There are also issues of conflicting interpretations of data and the strong influence of local factors on data obtained.

Using a survey of twenty-five PPA employees, environmental responsibilities were reviewed in the port authority and port operator functions. The PPA corporate strategy does not mention environmental sustainability or an equivalent indicator regarding target outcomes. The PPA Vision 2020 regarding global standards and port services excludes environmental outcomes. That said, PPA does have an existing environmental policy although its scope remains unclear in actual application.

There is no doubt about the clear intent of PPA to address its environmental position in the performance of its mandate. The numerous Environmental Policy issuances (EPs) of PPA satisfies the criteria provided under ISO 14001. However, the numerous existing policies have varying scope and applicability e.g. some are only applicable to specific ports and processes. Furthermore, these policies were issued at the level of the PPA Management whereas within the organizational structure of PPA policy-making powers are vested solely in the Board of Directors . The challenge, therefore, is for the port authority to harmonize the various environmental policies into a single Environmental Policy which is duly approved and adopted by the PPA Board of Directors, whose scope and applicability covers all facets of operations of PPA. If this were the case then the overall environmental performance of the entire PPA can be assessed, evaluated, and objectively measured on a regular basis at Board of Directors level where actions can be agreed, directed, and followed up.

The ISO 14001:2015 Environmental Management System Requirements classifies environmental and related activities into:

1. Prevention of pollution
2. Protection or conservation of the environment
3. Fulfilment of compliance obligations
4. Enhancement of environmental performance

The Port Management Offices (PMOs) were surveyed for the corporate adoption of environmental policies/ programmes and the local implementation of green port initiatives. The study showed that 88% (22 PMOs) have existing environmental policies and initiatives. Of these, 80% have policies to reduce pollution and 68% aim to protect the environment; only 40% are directly related to the enhancement of environmental performance.

Figure 51 below shows the types of Common Green Port Initiatives (GPIs) and Environmental Best Practices (EBPs) implemented by Port Management Offices according to their nature or purpose. While the GPIs and EBPs are reported to the Head Office, there is no independent assessment or evaluation published showing how the results compare with PPA environmental policies.

All PPA ports need to measure their own performance to manage and improve environmental outcomes. However, only seven ports (26%) under PPA have implemented an environmental management system (EMS). The PPA needs to issue a single PPA Port Environmental Policy and adopt a uniform EMS as an environmental performance measure to regularly assess performance in terms of sustainable environmental management of PPA ports.

Recommendations

While responsibility for environmental issues have been assigned at various levels and functions in PPA, it is clear from the research that only the major ports have established a formal EMS. The other ports implement environmental programmes, activities, and projects (E-PAPs) on an ad-hoc basis. This indicates that overall environmental management in ports under the control of PPA is not institutionalized at the highest level and therefore does not permeate throughout the organization. In providing the needed link between performance and environmental strategy, PPA should pursue the following recommendations to measure and manage environmental performance of ports:

1. Establish, develop, and implement an Environmental Management System under ISO 14001 standards and applicable to all ports.
2. Harmonize all environmental policy issuances of PPA into a single Environmental Policy which is formally adopted.
3. Adopt the EMS as an environmental performance measure for PPA ports to assess and report on sustainable environmental management performance on an annual basis.
4. Incorporate selected green port initiatives/ environmental best practices by the PMOs as an initial standard component E-PAPs of the EMS.

Prevention of Pollution	Protection/Conservation of Environment	Enhancement of Environmental Performance
• Port waste management • Air quality monitoring • Water quality monitoring • Emission testing • Shore-based power supply utilization	• Tree and mangrove planting • Coastal and ports clean-up • Greening of port premises/ Gandang Pantalan/ Puerto Guapo/ In-port carbon sinks/ Port gardening vermicomposting/ Conversion of idle port land to herbal gardens • Energy conservation measures/ Observance of Earth Hour • Provision of efficient solar-based or LED lighting systems • Water conservation measures • Water clean-up/ underwater clean-up SCUBASURERO	• Conduct of port safety, health and environment inspection • Maintenance of valid environmental permits and licenses/ environmental clearance certificates • Membership in local environmental council • Lecture/ environmental extension program (e.g. mural painting, photography contest, fish feeding) • Computerization/ automation of system utilizing paperless transactions • Use of Euro 4 compliant fuels

Figure 51: Green port/environmental best practices in PMOs according to nature or purpose

a. Hot-Ironing or shore-based power supply for ships
b. Move to renewables for sources of energy
c. Quarterly reporting of air and water quality monitoring results
d. Create awareness of environmental matters among all staff in PPA

5. Improve environmental responsibilities in PPA by creating an Environmental Committee at the level of the PPA Board of Directors.
6. Regularly publish the environmental performance data in PPA and include environmental performance metrics in the PPA Annual Report in the same way as financial and operational measures are reported.

Sustainable Development Goals

In the 2030 Agenda for Sustainable Development, sustainable transport is mainstreamed across several SDGs and targets. The targets of relevance to this study and its recommendations are especially those related to SDG 7 which sets a goal of having much higher levels of ambition relating to renewable energy, including transportation and heating.

SDG 7 – Ensure access to affordable, reliable, sustainable and modern energy for all

By implementing this reports' recommendations and establishing an ISO 14001 standard for environmental planning and moving to green port initiatives, the Philippine Port Authority will be in line with the goals, targets, and indicators of the United Nations SDGs. The sustainable policies pursued by PPA will equip it with an environmental management system which will facilitate the collection of data that will inform policies to combat climate change.

Implementation Update

Following a presentation to Management at Philippine Port Authority, the formal adoption of one of the key recommendations of Mr. Mapolo's dissertation was agreed and an Administrative Order 'PPA No. 05-2018', otherwise known as 'The Port Environmental Policy', was approved. This order provides for all environmental activities and strategies in the Philippine Port Authority to be consolidated in one source to be reviewed and amended and approved by the Board of Directors on a regular basis.

Review and Improvement of the Training Impact Assessment/ Evaluation Programme of the Philippine Ports Authority

Author of the case study: Mr. Karlo F. Madrilejo, Port Operations Chief, Port Operations and Services Department, Philippine Port Authority

Mentor: Ms. Lilian T. Javier, Department Manager, Port Operations and Services Department, Philippine Port Authority

Figure 52: Photo of (left to right) Mr. Karlo Madrilleno (author), Ms. Lilian T. Javier (mentor) and Mr. Fernando Mapolo (cohort member)

About the Author

Mr. Karlo F. Madrilejo mentioned that his close friend who was also a participant in the UNCTAD programme, Mr. Fernando B. Mapalo Jr. (Toto), and his mentor and supervisor, Ms. Lilian T. Javier, played the most important roles for him to take part and enroll in the UNCTAD Modern Port Management training.

> "Toto was a big factor for me to join the programme as he is my close friend. The programme was exciting but at the same time incredibly challenging. I admitted I wanted to give up sometimes, but Toto and Ma'am Lilian pushed me through."

When asked about the most memorable moment in his journey with the UNCTAD Programme, Mr. Madrilejo replied:

> "I had to hurdle a lot of challenges for my dissertation paper especially during the mock defense where my mentor called me up the night before the presentation. She told me that I needed to revise my paper in order to come up with more logical recommendations! I worked all night and was nervous. When I learned that me and Toto graduated as the top two of the class, I was shocked. We were all hugging! Ma'am Lilian was very proud as we were both her mentees. It was very emotional and inspiring moment."

Mr. Madrilejo chose to work on finding solutions on human resources policy as his dissertation subject which correlated with an on-going ISO certification project he was working on for his mentor. "It was very enjoyable this way as I got to apply lessons learned from UNCTAD training on a day-to-day basis and I was working on a relevant project with real needs", explained Mr. Madrilejo. His recommendations were put into implementation and although he has moved to another department, his plans continue.

> "I think UNCTAD has reinforced and strengthened the values PPA has instilled in me. It has always been my dream to be part of PPA's Management, and the UNCTAD programme has provided me with a holistic knowledge on port operations and management. The training programme added knowledge and realization in the current position I am holding right now."

Mr. Madrilejo is still actively involved in the UNCTAD Port Management Programme, this time around as a mentor to another participant who also works on a hands-on project. He also decided to pursue further education by enrolling in a law school while continuing working with PPA.

> "I'm very grateful to UNCTAD and PPA management. UNCTAD inspired me to further enhance my knowledge and skills. The programme also helped me in terms of analysing, identifying problems, and many other different areas. I'm now applying these skills at work and in the new environment at the law school."

Background

The Philippine Ports Authority was formed in 1974. One of the powers of the PPA is to provide or assist in the provision of training programmes and training facilities for its staff and the staff of port operators in order to ensure efficient discharge of functions and responsibilities. The Human Resource Management Department and, more specifically, the Career Development Division, was tasked with establishing a PPA-wide career development system. Currently, PPA

uses training programmes to ensure the progress and development of employees, and to retain highly skilled personnel. Responsibility for delivering the training falls to the PPA Training Institute (PPATI) and the Human Resources Management Department (HRMD).

Introduction

The PPA has implemented a quality management system for the facilitation of vessel entrance and clearance processes. The implementation at the ports of Batangas, Cagayan de Oro, Davao, General Santos, Zamboanga, Ozamiz, Iloilo, Legazpi and Puerto Princesa have all been certified to ISO standard. Additionally, an expanded Management System on Port Safety, Health and Environment (PSHEMS) was developed and implemented in some PPA gateway ports, namely Iloilo, Cagayan de Oro, Batangas and General Santos, which have all been recognised by Partnerships in Environmental Management for the Seas in East Asia (PEMSEA). However, during numerous external audits by certifying bodies it was found that there was a need to conduct improved Training Impact Evaluation and Assessment (TIE/A) so that the workers could be certified to ISO standard for the continual improvement of the implemented quality management system.

The PPA is now faced with the challenge of extending the scope of its TIE/A programme beyond training that directly concerns management systems to all training programmes implemented and delivered by the PPA. PPATI is responsible for evaluating non-organic training (training of staff from port users/customers) while HRMD evaluates organic training (PPA staff training).

This case study provides a review and evaluation of the TIE/A programme that is currently implemented by the PPA. The policy requires the evaluation of courses conducted for both organic and non-organic training programmes before, during, and after implementation of the following:

- Newly developed programmes/courses
- Training delivered by new providers
- Regularly run training programmes that have been revised and upgraded
- Foreign-assisted training programmes
- Ad hoc and unprogrammed training courses approved by PPA management

Research carried out for this case study found that there was insufficient training evaluation data available for the period 2006 to 2013 and it was decided to exclude a review of the evaluation and impact survey forms used by the PPA at that time. Primarily data from existing documents was used for this study. The main documents reviewed were internal PPA circulars relating to TIE/A such as memorandum orders, guidelines, audit, and accomplishment reports. Annual financial statements were also examined to ascertain PPA's training related operating expenses.

Analysis

Training is considered effective when it contributes to the achievement of established development objectives. The effectiveness of training is usually measured under three headings:

1. Learning outputs: did training result in the acquisition of new knowledge and relevant skills?
2. Workplace behaviour outcomes: are trainees applying acquired skills in the workplace?
3. The impact of development capacity: is there evidence of improved institutional or organizational performance?

Each training programme can then be rated Good (training largely achieved objectives), Medium (training partially achieved objectives), or Poor (training did not achieve objectives). Establishing a valid need for training is the foundation on which its effectiveness can be determined.

Although the PPA has been implementing training programmes for ten years, only a few programmes to date have been subjected to TIE/A. There is insufficient data available between 2006 and 2013, although some TIE/A was conducted in 2014-2016 for management system trainings in selected port management offices. The highest numbers of TIE/A took place in 2016 when nine or 2.3% of training events were subjected to TIE/A as shown by the following table.

Turning to financial investment in training, PPA has increased expenditure from 9 million pesos (US$200,000) in 2014 to 49 million pesos (US$1 million) in 2016. The 2016 figure represents 0.8% of operating expenses. After examining

Type of Training Programme	2014	2015	2016
In-house Programmes	43	54	68
Management Succession Programmes	7	11	10
Quality Management System Programmes	5	20	67
PSHE/Integrated Management System Programmes	3	15	6
Foreign Training Programmes	10	18	14
Local Training Programmes	279	225	227
Total Number Implemented	**347**	**343**	**392**
Total Number Subjected to Training Impact Evaluation	**5**	**6**	**9**
Percentage Covered by TIE	**1.44%**	**1.74%**	**2.29%**

Figure 53: Training programmes implemented and subjected to TIE/A – 2014 to 2016

the PPA's annual financial statements, it was interesting to note that there was a significant increase in training costs between 2014 and 2016. However, training investment remained below 1% of PPA's total operating costs. The author asserts that the return on training investment needs to be determined in terms of benefit to the organization and the staff.

Assessing the current TIE/A policies of the PPA, it appears that certain provisions of the existing policy pertaining to responsibilities are not relevant to the current organizational structure of the PPA given that some titles and roles such as port district officers no longer exist. In addition, the positions of Industrial Relation Development Officer and Senior Industrial Relations Development Officer, which the PPA TIE/A policy identifies as responsible for undertaking the evaluation are not in the current approved staffing pattern of the PPATI nor HRMD. This points to a re-structuring which has taken place without updating of charts of roles and responsibilities.

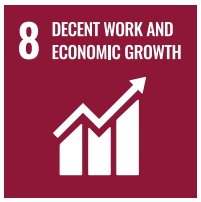
Recommendations

This case study recommends the following action points to improve the PPA's TIE/A programme:

- The TIE/A policy should be updated with specific attention given to responsibilities, scope, and criteria, as well as predetermined performance/success indicators.
- The survey forms should also be updated and should incorporate the current requirements on performance evaluation in the PPA strategic performance management systems.
- The PPA should create a single unit whose sole function is to monitor and evaluate the effectiveness of training programmes. This will eliminate the overlap of functions between the PPATI and HRMD. Furthermore, TIE/A may be decentralized to port management officers as this will facilitate timely completion of evaluations. This would also allow collaboration with the Information and Communications Technology Department to allow for TIE/A surveys to be taken online.
- The PPA should ensure that the TIE/A policy is consistently implemented for all training programmes run by the PPATI and HRMD.
- Impact evaluation for courses for both internal and external training should be conducted at stages of 6 months and again at 24 months following the delivery.

Sustainable Development Goals

In the 2030 Agenda for Sustainable Development, sustainable transport is mainstreamed across several SDGs and targets. The targets of relevance to this study and its recommendations are especially those related to:



SDG 8 – Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

By assessing the impact of the training that PPA staff are receiving, the PPA can foster a decent work environment that has benefited from new and adequate training. Training Impact Evaluation and Assessment policies ensure that PPA employees are receiving appropriate training that contributes to their continued personal development.

Implementation update

The following activities have been implemented to improve the PPA's TIE/A programme:

- Timely implementation and conduct of the evaluation and assessment is now taking place as part of the PPA's Human Resource Development Programme.
- Regular updating of the TIE/A survey instruments is in place to reflect development objectives and requirements on performance evaluation in the PPA strategic performance management systems.

D. GHANA

Statement of Mr. Michael Luguje, Director General, Ghana Ports and Harbours Authority

Figure 54: Photo of Mr. Michael Luguje, Director General, Ghana Ports and Harbours Authority

"The Ghana Ports and Harbours Authority (GPHA) has been privileged to be a founding member of the UNCTAD Port Management Programme English Language Network and has been an active participant since the signing of the Dublin Declaration in 2007.

GPHA recognizes the UNCTAD Port Management Training Programme as a very important tool to enhance capacity building. GPHA has successfully organized four (4) cycles of the UNCTAD Training for Trade Port Training Programme. So far, 106 middle level management staff from the Ports of Tema and Takoradi and their Port Communities have benefitted from the programme, with about 60% of the participants coming from GPHA. Indeed, till the outbreak of the COVID-19 pandemic, GPHA was organizing the Cycle Five (5) of the programme with 23 participants.

The programme has been successful and beneficial to GPHA and other Institutions in the Port Community like the Ghana Maritime Authority, Ghana Shippers Authority, Regional Maritime University, Ghana Revenue Authority (Customs Division), and members of the Ship Owners and Agents Association of Ghana.

The programme has strengthened Talent Management and Human Resource Development in our Ports. Some former participants have risen to occupy top positions in the Port Community.

As a result of the continuous training and professional development, it has created a pool of skilled staff with great potential to take on further responsibilities and show excellence in performance.

Most of the past participants from Ghana Ports and Harbours Authority and the Port community are used as local Instructors on UNCTAD Training Programmes.

Figure 55: Port of Tema

The Programme has also built strong network among staff of the Port and the Port Community, fostering strong collaboration in the Logistic chain.

Due to the benefits we derive from the UNCTAD Port Management Series, the Management of GPHA will continue to support the programme. GPHA will also continue to encourage more organizations in the Port community to participate and broaden the level of participation among their staff."

Overview of the Ghana Ports and Harbours Authority[6]

The Ghana Ports and Harbours Authority was established in 1986 to build, plan develop, manage, maintain, operate and control seaports in Ghana.

Currently, GPHA manages and operates the Ports of Tema and Takoradi in collaboration with private service providers. GPHA is currently, undertaking a Master Plan and Feasibility studies for the development of a third Port at Keta, which is close to the eastern border of Ghana.

In 2019, the two Ports of Ghana handled 27,700,243 metric tonnes of cargo. The Port of Tema handled 63% of the cargo.

In its bid to transform the seaports of Ghana into regional hubs, the GPHA has signed a concession agreement with Meridian Port Services to build a 3.5 million TEU Container Terminal with a draft of 16.0 metres at Tema. The first phase of the project has been completed to meet the demands of large vessels. This has increased the Port's capacity and reduced congestion.

At the Port of Takoradi, a dry bulk jetty has been constructed with operational infrastructure yet to be procured. In addition, a concession has been granted to Ibistek, a Ghanaian Company, to develop a Multipurpose Container Terminal which will increase the Port's capacity to handle up to one million TEUs.

Challenges faced by GPHA include reduction of revenue and container operations and high operating and General /Administrative cost.

Moving forward, GPHA is optimizing revenue generation and equipment utilization, cutting cost and enhancing Human Capacity.

[6] Section provided by the Ghana Ports and Harbours Authority.

A Study on the Evaluation of the Impact of the Performance Contract between Ghana Ports and Harbours Authority and the Government of Ghana

Author of the case study: Ms. Margaret Aidoo Quarcoopome, Principal Business Development Officer, GPHA

Figure 56: Photo of Ms. Margaret Aidoo Quarcoopome (author)

Mentor: Mr. Samuel Ntow-Kummi, General Manager, Corporate Planning, GPHA

Figure 57: Photo of Mr. Samuel Ntow-Kummi (mentor)

About the author

Ms. Margaret Aidoo Quarcoopome always strives for a challenging and dynamic working environment where she can contribute added values. Originally from the banking and finance sector, she left her previous field and joined the port community to support business development strategy work. "When I got the job at the port, I realized it was very much in line with what I wanted to do. I thought that 'here, I can have an impact'", said Ms. Quarcoopome.

Ms. Quarcoopome expressed her gratitude for her supervisor and mentor, Mr. Samuel Ntow-Kummi, who played an important part in her career journey.

> "He is very supportive and at the same time challenges me so much, which makes me love the job! The conversations and exchanges helped me develop myself. I really look up to him for his leadership skills and wanted to be like these role models at the port. He strongly encouraged me to join the UNCTAD programme as he wanted me to have more exposure. I took the chance and it was amazing. The course really opens you up with what is happening in the industry. The speakers brought real experiences. The programme further strengthens my knowledge and ability to add value to the system."

It is worth noting that Ms. Quarcoopome's mentor, Mr. Ntow-Kummi, is no stranger to the programme. Apart from participating as a mentor of three participants in Cycle 4 in Ghana, he was himself enrolled in training of the UNCTAD Modern Port Management Programme in the past and also contributed to the UNCTAD Ad Hoc Expert Meeting on Assessing Port Performance.

As Ms. Quarcoopome graduated from the programme as the best student in her year, Mr. Ntow-Kummi encouraged her to continue her education at the prestigious World Maritime University in Malmö, Sweden, where she received a full scholarship.

> "The UNCTAD Programme laid the foundation for me. Port Management is key to growing economies and trade globally. It has been an incredible journey – I look forward to being back at my work in Ghana and making an impact."

Meanwhile, her dissertation work has also influenced GPHA in a meaningful way through more efforts presently being made to use barges in transporting containers to the port and the challenge of delay of inland container depot (ICD) containers along the port access road are being seriously addressed.

> "I want to give back and I hope to contribute as a speaker for the global network of the port community in the future – to bring knowledge and skills to those in my industry. Currently I am also helping a few participants with their dissertations work and help consult with people who want to apply to the UNCTAD programme."

Finally, she believes that "whether you are male or female, the port industry is very interesting and dynamic. And it doesn't matter who you are, you can make an impact".

Background

Ghana Ports and Harbours Authority (GPHA) is a state-owned enterprise (SOE) which manages the ports of Tema and Takoradi in Ghana. GPHA is subject to state polices and regulations governing SOEs. The central purpose of this paper is to examine the impact and efficacy of the Government's policy relating to performance contracts between the state and GPHA.

As far back as 1987, the Government of Ghana introduced a programme of public enterprise reform. Subsequent administrations continued this policy. Performance contracts are seen as a good corporate governance tool to manage the efficiency and effectiveness of SOEs as major players in the economic life of Ghana.

There is significant academic literature surrounding agency theory as it relates to performance contracts. In the case of GPHA, the port management is the agent whereas the State is the principal. The State as the principal delegates certain roles and responsibilities to GPHA acting as its agent. Agency theory tells us that mechanisms must be introduced into this relationship to ensure that the agent does not misuse its power to the detriment of the aims of the principal.

Because Management of GPHA have much more information about the business than the shareholder (the State), there is potential for a conflict of interest to arise between both parties. A common approach to managing the challenges posed by conflict of interest issues is to set goals and targets agreed by both parties in a Performance Contract. Both parties sign an agreement to perform specific roles in achieving set goals and performing agreed obligations usually on an annual basis.

The performance reporting by port management covers annual plans for financial and operational performance as well as its labour force and capital expenditure plans. At a more detailed level, GPHA presents its budgets across various heads including corporate expenditure, procurement, maintenance and health and safety.

Both GPHA and the Department of Finance sign off on the terms and conditions of the annual performance contract. The State Enterprises Commission (SEC) acts as referee in the event of disputes arising. GPHA is held accountable for its performance through a system of quarterly review reports submitted to the SEC. Deviations from annual budgets, corporate plans, procurement plans and maintenance and health and safety plans must be reported on and justifications given.

The final stage of a strong oversight process is the requirement on GPHA to present and defend its annual accounts to the Parliamentary Select Committee on Employment, Social Welfare and State Enterprises. Clearly there exists a strong process to plan and agree performance goals for GPHA. There is also a clear division of responsibilities between the Government as shareholder and GPHA. Accountability rests on the shoulders of GPHA to deliver against agreed targets. Failure to meet agreed performance measures may result in sanctions.

Introduction

The objective of this case study is to analyse and assess the impact of annual Performance Contracts between GPHA and the Government. The overall objective is broken down into sub-tasks as follows:

- to examine any gaps in implementation of the performance contract within legal, administrative, or institutional frameworks.
- to establish if performance contracts have had an impact on GPHA's activity and throughput and identify challenges in the current performance contract.

The study was conducted in two stages. The first stage was face-to-face and telephone interviews with GPHA, and SEC managers directly involved in the performance management contracts process. Stage two required collection, analysis, and synthesis of data from other sources such as contract documents, budgets, and quarterly reviews over an eleven-year period.

Analysis and Research Findings

Indicators that provide a reliable link to the performance of GPHA operationally and financially were selected to give a comprehensive view of the performance. Throughput measures for container and other cargo traffic were used to assess operational performance against targeted performance. Similarly, for financial indicators factors such as operating profit, staff costs ratio to total revenue, return on investment (ROI), return on capital employed (ROCE), and labour productivity, etc. were chosen. The data was presented in tabular form with line graphs used to show the trends.

Chief among the implementation gaps identified within the Legal, Administrative, and Institutional framework was inadequate monitoring by the SEC. Nine out of ten respondents believed that the existence of the performance contract has been impactful. However, the majority felt the impact had been 'average'. The picture is very clear when respondents were asked about implementation challenges of the performance contract process within GPHA where the vast majority of respondents agreed on two things:

1. There is inadequate awareness and communication to staff.
2. Late submission of reports is a big problem.

Operational Performance Indicators showed an average variance of -1.5% over eleven years to 2016. While the range of variation moved from +16.6% in 2011 to -20% in 2009.

The trend lines in Figure 58 and 59 below show the deviation from targets for total cargo throughput and total container TEUs per annum for the period 2006 to 2016.

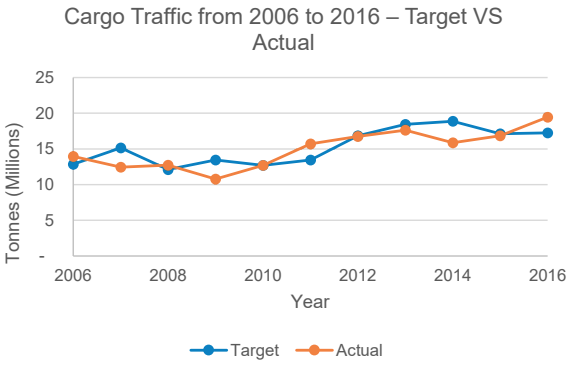


Figure 58: Cargo throughput – 2006 to 2016

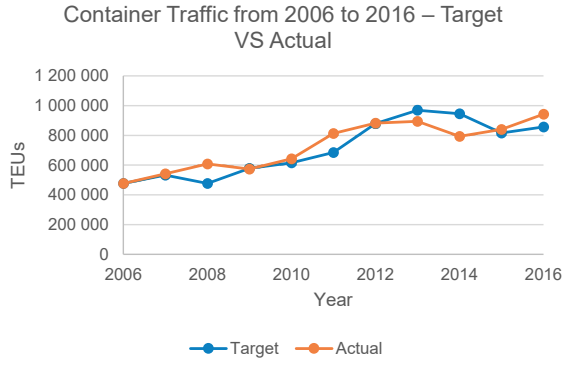


Figure 59: Container throughput – 2006 to 2016

The financial performance in terms of target versus actual is analysed across many factors including operating profit (see Figure 60 below), net income after tax, net profit margin, ratio of staff costs to revenue, ROCE, labour productivity, etc.

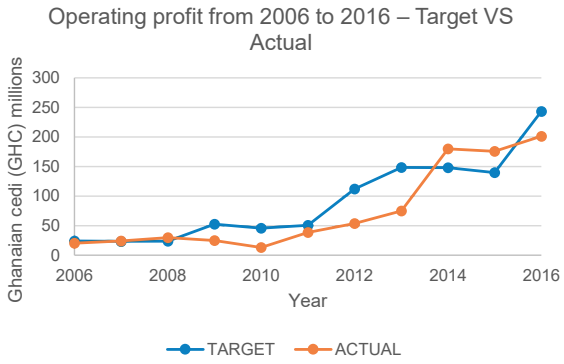


Figure 60: Operating profit of GPHA – 2006 to 2016

Conclusions

The case study findings showed that all parties believe in the idea that performance contracts are a useful tool for Government to hold SOEs accountable for their activities in meeting agreed targets. The interviewees were in no doubt that performance contracts are effective in directing GPHA's development. However, they felt that the GPHA holds the upper hand in negotiations with the SEC because they (SEC staff) do not have enough knowledge or information about the maritime industry and more particularly the port sector.

The observations suggest a lack of commitment to the process from the shareholder side. An indication of the lack of real engagement is the finding that GPHA frequently missed quarterly reporting deadlines without any sanction or corrective action being called for. The interviewees commented on the almost non-existent level of monitoring of physical projects by way of site visits and low levels of on-going performance monitoring throughout the contract period.

Additionally, even though it is provided for in the SEC legislation, feedback is not provided to GPHA so that corrective actions or further explanations can be given prior to annual reports being submitted to the legislature. Additionally, the process suffers from the perception that there is a focus on the ritual and compulsory nature of the reporting rather than on seeking out improvements.

Cargo traffic, operating profit, net profit margin, staff costs compared to revenue and return on capital employed showed the actual performance being unfavourable against the targets set over the study period. However, container traffic, net income after tax, administrative cost to revenue ratio, and labour productivity per capita showed the actual performance being favourable when compared to the targets.

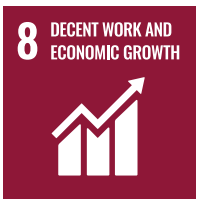
The mixed results from the sample indicators may be due to the fact that the targets were soft. This implies that that the performance contract through the targets has little impact on the real performance of GPHA.

Recommendations

1. Make the SEC more effective by increasing its resources of qualified staff and increase its powers to sanction non-conforming agencies it is responsible for holding to account.
2. Re-introduce a reward mechanism for SOEs who perform well.
3. Introduce the compulsory holding of AGMs for all SOEs to improve governance, transparency, and accountability.
4. Improve the competence of the Parliamentary Select Committee by allowing it to call on experts in the field under review so the members are better prepared in advance of meeting the SOE executive management.
5. Invest in technology to improve its data gathering and terminal management systems.
6. Prepare and implement an awareness process for all staff involved in the performance management process.
7. Put in place a comprehensive budget production and management process which will feed into the strategic and business planning, monitoring, and reporting process.
8. Establish performance contracts internally between the Board and the Director General and between the Board/Director General and Senior Managers.

Sustainable Development Goals

In the 2030 Agenda for Sustainable Development, sustainable transport is mainstreamed across several SDGs and targets. In this case the most relevant is:



SDG 8 – Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

The related targets fall under 8.1[7] and 8.2[8] which are linked to indicators 8.1.1[9] and 8.2.1[10]. Inclusive and sustainable growth comes about when well managed companies produce and implement carefully crafted development plans which are based on accurate data and information which is used in turn to inform their planning process. The recommendations emanating from this report point the way for the State Enterprise Commission and Ghana Ports and Harbours Authority to improve co-operation and deliver meaningful progress in setting performance targets to continuously improve throughput, financial returns, corporate governance and investment returns to the state, thus leading to sustainable growth and more productive employment.

[7] Sustain per capita economic growth in accordance with national circumstances and, in particular, at least 7 per cent gross domestic product growth per annum in the least developed countries.

[8] Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value added and labour-intensive sectors.

[9] Annual growth rate of real GDP per capita.

[10] Annual growth rate of real GDP per employed person.

An Assessment of Waste Oil Storage and Disposal Practices in Takoradi Port

Author of the case study: Mr. Kingsley Amamu Caiquo, Principal Maintenance Officer, Ghana Ports and Harbour Authority

Figure 61: Photo of Mr. Kingsley Amamu Caiquo (author)

Mentor: Mr. David K. Ham, Estate and Environmental Manager, Ghana Port and Harbour Authority -Takoradi

Figure 62: Photo of Mr. David K. Ham (mentor)

About the author

When asked about the Port Management Programme, Mr. Kingsley Amamu Caiquo said: "UNCTAD has broadened my knowledge in the port industry, and in fact, positively effects port activities of the nation."

In Ghana, students who graduate from accredited tertiary institutions are required under law to do a one-year national service to the country. It was then that Mr. Caiquo joined the port community and it has become his family ever since.

Mr. Caiquo is a strong believer in continuous self-development and lifelong learning. When he moved to the Marine Services Department in 2012, he was determined to master his work and decided to pursue further education at the Maritime Academy. In 2014, Mr. Caiquo also pursued a bachelor's degree in Engineering Physics, followed by a distance-learning master's degree. In 2016, when the opportunity to participate in the UNCTAD Modern Port Management course came up, he took this up right away.

> "I love learning and I also like teaching. This will never stop. Of course, it can be challenging – but it is the matter of time management.
>
> I really wanted to gain a deep insight into the industry because I was from a pure mechanical background. The programme broadened my knowledge in the port industry as well as the maritime sector in general. The issues of safety and environmental sustainability became priority in all my work ever since I completed the UNCTAD Module 4 section."

Mr. Caiquo cited Mr. Justice Kobina Yalley, a successful participant of the UNCTAD programme from Cycle 2, as his inspiration to join this endeavor. "I was inspired by the career progress of Mr. Justice. His performance after the UNCTAD Port Management Programme has been exceptional." However, the first time Mr. Caiquo applied to the UNCTAD programme, he got rejected. "Mr. Justice told me not to give up and to apply again the next time around. He was like a coach to me.".

Mr. Caiquo eventually got accepted for Cycle 4 and graduated among the top of his class. Mr. Caiquo's recommendations from the dissertation work have also been implemented.

> "To some extent, the port now has a recommended storage facility for waste oil in all departments that generate waste oil. The port also ensures that no waste oil is released to scrap dealers. Proper storage and disposal of waste oil is now a priority in Takoradi."

When asked about his memorable moments during the journey, Mr. Caiquo replied:

> "It was a wonderful experience and I really appreciate everything: practical exercises, way of thinking. I will always remember team number 5 and the group work. It was a good approach to learn. Team 5 was made of different professionals – civil and marine engineers, procurement, and finance, and we always learned new things whenever we met. It was opening the mind, having different perspectives from different departments."

Background

Ghana Ports and Harbours Authority is a state-owned enterprise which manages the ports of Tema and Takoradi in Ghana. The Port of Takoradi on the Atlantic Guinea Coast is located 225 km west of the capital city, Accra and 300 km east of Abidjan, the capital of Cote d'Ivoire. The port handles 6 million tonnes of throughput annually. Its strategic location just 45 nautical miles from the country's major oil and gas fields has seen vessel calls treble to 1,525 in ten years. Takoradi port has a staff complement of 770 comprised of 38 managers, 141 senior staff and 590 others.

The Mission Statement of the port is: "to provide efficient services to customers in an environmentally sustainable way to stimulate growth in the economy and sub-region."

The port Management has committed to the following goals to deliver its mission:

1. Protect the environment and comply with ISO14001:2015
2. Eliminate workplace accidents and comply with OSHAS 18001:2007
3. Ensure customer satisfaction and comply with ISO 9001:2015

By linking strategic goals with international standards of quality and best practice, the port can be seen to be taking its commitments seriously and in a way which can be audited and reported on openly and transparently on a regular basis.

Introduction

The multitude of activities that take place in ports everyday generate many different types of pollution. This case study focusses on the originating activities as a means of categorising types of pollution. For example, construction activities such as dredging berths or building quay walls disturb the sea and riverbed and may destroy aquatic life, this is called structural pollution. Accidental pollution arises from spillages of oil and wastewater or chemicals into the surrounding waterways which can contaminate the body of water and cause untold damage to the ecosystem. Then there is 'operational pollution' due to certain cargo handling activities such as grab cranes loading/unloading bulk products like grain or animal feed which can lead to dust particles polluting the air and contaminating the water.

The author turns his attention in this report to a common problem faced by all ports and that is how best to manage waste oil emanating from operations or from plant and equipment whether it is as a result of landside or waterside activities. The two departments under scrutiny are Mechanical, which is responsible for all port-owned maintenance of plant and equipment, and Marine Engineering, which is charged with maintaining all floating plant and equipment from tugs to pilot boats and other workboats. The output from privatised operations does not feature in the report. We are told that 77,073 litres of lubricating oils were consumed by port plant and equipment in 2016.

The objective of the case study is to assess whether the large volume of waste oil lubricants generated each year in Takoradi Port is disposed of in an environmentally acceptable manner and how well the policy of drain, store, and dispose of is adhered to and verified.

The analysis seeks to answer the following three key questions:

1. How is the lubricating oil drained?
2. What investment has the port made to provide for proper disposal facilities and practices?
3. Is the current operational process environmentally acceptable?

The case study points to regulations and the legal framework governing pollution which Takoradi Port is obliged to comply with. Chief among them in Ghana is the *Oil in Navigable Waters Act* – 1964 under which Takoradi Port is obliged to regulate shipping and other port activities and to avoid all forms of pollution in navigable waters. Additionally, Ghana is a signatory to the IMO MARPOL Convention requiring its ports to provide facilities for ships to store and dispose of waste oil. Also, on May 30 2003, Ghana signed up to the *Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposa*l dealing with human health protection and imposing strong controls on the movement, transport, treatment, reuse, recycling, recovery and final disposal of hazardous waste in an environmentally acceptable manner.

Analysis

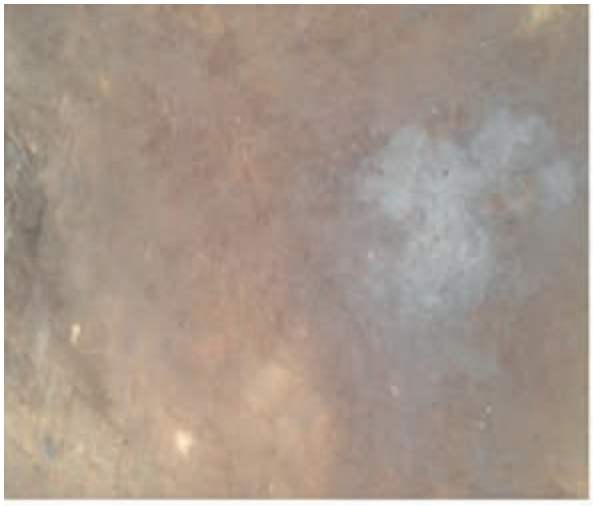
As part of the case study, the research was done through a combination of site visits and face-to-face interviews as well as a review of secondary sources gleaned from internal reports from GPHA and Nigeria

Ports Authority, and from UNCTAD publications. The researcher made several site visits to the Engineering and Marine Departments and importantly, to a licensed private company contracted to collect waste oil from the port and take it to its own certified treatment facility.

More than 37,000 litres of waste oil are generated by Takoradi Port operations annually. This does not include waste product collected from ships. The ship's agent hires in a licensed private sector waste company to deal with ships' waste oil.

The findings from site visits showed that waste oil generated by port-run operations is most often drained from plant and equipment using the gravity flow method and a smaller proportion by mechanical pumps. Both methods resulted in spillages being observed. Gravity feeding of oils into small containers resulted in accidental spillages due to mishandling of the containers while being carried. Waste product was observed on the ground, in drains and running into waterways, see photo montage shown in Figure 63 below (photos taken by Mr. Kingsley Amamu Caiquo).

It was further observed that oil spills were left to soak into soil and left unrecovered in open sea areas, whereas oil absorbing sheets were used to recover spills from the dry dock area. This indicates a lack of consistency in dealing with accidental spills and a lack of regard for the potential damage to the eco-system.



a. Waste oil spilled on the floor

b. Waste oil spilled into soil

c. waste oil spilled into gutter

d. Waste oil spilled into sea

Figure 63: Examples of waste oil spillages in Takoradi Port

Inconsistency was observed also in the type and suitability of container units used to store waste oil. Sometimes, completely unsuitable open drums were used alongside more appropriate sealed drums or ISO tanks. However, it was evident that no secondary containment e.g. bunded tank areas were used.

Furthermore, the analysis phase revealed that oil change intervals for mechanical plant and equipment are based on running hours and periodic planned maintenance (preventive maintenance) rather than adopting predictive maintenance routines by regularly sampling lube oils and sending them for laboratory analysis. The laboratory results will show the properties of the oil, suspended contaminants, and evidence of debris from wear and tear.

Maintenance engineers then have a professional laboratory analysis and data to base decisions on. The author suggests that there may be an opportunity here to reduce overall oil usage and, as a result, the volume of waste oil would also decline due to longer periods between oil changes based on lab test results.

During the analysis phase of the case study, it was recorded that only 30% of the interviewees said that they were aware of the impact that waste oil escaping into waterways or leaching through soil had on the environment.

The method of draining waste product in the port is ad hoc due to the lack of proper facilities rather than following best practice based on an accredited international standard. The study found that 65% of waste oil is drained by gravity into small containers with 35% drained by pumps into intermediate bulk containers (IBCs) which serve as storage tanks.

Up to 90% of the waste oil collected from port operations is passed on to mainly un-regulated scrap dealers with only 10% going to a privately operated and government regulated waste disposal company. Zeal Environmental Technologist Ltd. (Zeal) provides and operates a port waste oil reception facility for waste oil generated by the port and by ships calling there. This facility is a requirement of the MARPOL Convention referred to earlier. Under the sanctions clause of MARPOL, MSC was recently fined $50,000 for an incident resulting in pollution of the marine environment when oil discharged from the tanks of MSC Alexa. Zeal provides accredited systems to transfer waste oil from ships to road tanker and on to its purpose-built facility 20 km from Takoradi Port. Zeal is certified under ISO 14001:2004 and by the IPA-Ghana.

Conclusions

It is evident from the analysis that the method used to drain oil from port owned plant and equipment, and the lack of sufficient bunded storage units to hold product prior to collection and removal are the main reasons why waste oil gets spilled and ends up either leaching into the ground or flowing directly into nearby water

Figure 64: Road-tankers collecting waste oil from ship in Takoradi for transfer to treatment plant

channels. Around 5% or 2,000 litres of waste oil is spilled each year. Thus, a large quantity of hazardous waste ultimately ends up polluting the land and sea causing serious damage to water quality as well as the marine and aquatic life. There is no record of the number of spill incidents involving waste oil in the port or the magnitude of each spill. However, the author does point out that a relatively small spillage of 10 litres can completely cover a waterbody of one hectare.

Damage to soil which is not remediated by retrieving the waste oil is just as damaging as the same incident occurring in a body of water. Biological cycles in the soil are affected. Plants cannot develop, metal content of any surviving vegetation is increased. Then when the oil leaches into water it creates havoc with living organisms such as phytoplankton which fish depend on.

A lack of awareness among key workers about the damaging impact of waste oil spillages is alarming. At least if workers knew the real impact of oil spills, they are more likely to react in the right way to manage the threat to the environment rather than just ignore it.

The use of mainly unlicensed scrap dealers to take away 90% of the waste oil generated by port operations is more than likely going to mean that oil is not treated in accordance with proper environmental standards such as ISO 14001. This may lead at some future date to Takoradi Port suffering reputational damage if waste oil from the port ends up being disposed of in a way that is damaging to the environment or to human life.

Recommendations

1. Put in place a set of standard operating procedures for managing all aspects of waste oil from port operations.
2. Provide storage solutions that are appropriate and aligned with the risks involved in handling waste oil. All storage units to be bunded.
3. Train all relevant staff in the hazards posed by waste oil products. This will include health and safety briefings, so staff are familiar with their own safety needs and PPE and they know what to do in the event of a spillage of hazardous material such as waste oil.
4. Investigate the opportunities to save money and increase efficiency by moving to a maintenance schedule based on lab testing of lubricating oils rather than hours of use or run-time-based systems.
5. Examine the possibility of engaging a qualified and certified external service provider to take away all of the waste oil product emanating from Takoradi Port operations and in that way ensure the port is complying fully with its goal to protect the environment and comply with ISO 14001.

Sustainable Development Goals

In the 2030 Agenda for Sustainable Development, sustainable transport is mainstreamed across several SDGs and targets. The targets of relevance to this case study and its recommendations are especially those related to:

SDG 14 – Conserve and sustainably use the oceans, seas and marine resources for sustainable development

Green port policies are beneficial to climate action and in the case study outlined the recommended actions involve managing all waste lubricating oils from vessels and from port operations in compliance with ISO Environmental Standards and IMO MARPOL Regulations while also regulating the activities of licensed waste contractors. These actions will result in 40,000 tonnes of hazardous waste oils being treated in accordance with best international standards and remove the threat of any on this product entering the soil of waterways and polluting them. It also means that properly treated product can be recycled and reused for future generations. This will lead to a safer and cleaner marine environment.

Implementation update

Since completing his dissertation, senior management in GPHA have implemented several elements of Mr. Caiquo's recommendations, as follows:

- All departments must report to the Estate and Environment Department every time they have waste oil product for disposal. This ensures that accurate disposal records are kept and helps to facilitate appropriate inspections.
- Storage of waste product has been significantly improved as they now use covered containers with secondary containment areas.
- The ISO team and staff in the Safety Department have intensified their training and education in all areas of waste management.

Assessment of Waste Management Practices in The Port of Tema

Author of the case study: Ms. Delali Seglah, Principal Traffic Officer, Ghana Ports and Harbour Authority

Figure 65: Photo of Ms. Delali Seglah (author)

Mentor: Mr. Samuel Ntow-Kummi, General Manager, Corporate Planning, Ghana Ports and Harbour Authority

Figure 66: Mr. Photo of Mr. Samuel Ntow-Kummi (mentor)

About the author

When asked about her experience with the Port Management Programme, Ms. Delali Seglah said:

> "My whole career has been in port operations and therefore, the quest for pragmatic knowledge from experts in the field from all around the world in solving real issues on the ground – as well as for personal self-development motivated me to join the UNCTAD programme. The content of studies and the wealth of knowledge gained is an experience that is incomparable to any in the port industry."

Ms. Seglah's journey in the port community started right after her graduation. After finishing her one-year national service, she joined the port community with GPHA. She is an avid believer of lifelong learning and self-development. She had completed an advanced diploma, and a master's degree before joining the UNCTAD PMP.

> "Even though this is a certificate level programme, I was very eager to join because of its practicality. The skills and knowledge acquired has enhanced my decision making and implementation on best maritime practices as well as molded my attitude towards organizational activities."

Ms. Seglah expressed her view that there were a lot of added values from the programme:

> "There was so much that we gained from this programme: all the decision making, a broadened worldview, and the contribution to my confidence – it was a truly wonderful experience."

Ms. Seglah also appreciated that the programme brought everyone together from different departments and ports (Tema and Takoradi), who otherwise would not normally meet each other. "The network helps us participants in our daily work", she said.

The course also covers the United Nation's Sustainable Development Goals and this has inspired Ms. Seglah so much so that she chose to work on an environmental issue for her dissertation topic. Ms. Seglah went on to say:

> "In my daily work, I see the waste management company take the waste from the port and leave with piles of waste. I wondered what happens to all that waste. As a port, we can have a big impact on that, and I believe we should incorporate environmental sustainability goals into our practices. I also chose this topic to challenge myself since it is quite different from what I am used to working on in port operations."

Although her recommendations have not yet been implemented, she is not discouraged. She says "I look forward to sustainable waste management in the Ghana ports in the near future, it's a step by step process."

Background

Ghana Ports and Harbours Authority is a state-owned enterprise which manages the ports of Tema and Takoradi in Ghana. The Port of Tema on the Atlantic Guinea Coast is located 25 km east of the capital city, Accra. The port handles 75% of Ghana's international maritime trade with more than 1 million TEUs and 15 million tonnes of cargo handled annually. Tema is

strategically important for goods in transit to and from neighbouring land-locked countries of Burkina Faso, Mali, and Niger.

Tema port has a staff complement of 1,850 while a higher number still is engaged in the many private sector port related businesses providing services to vessels such as stevedoring, storage, berthing, freight forwarding and logistics, etc.

The Mission Statement of Tema Port is: "to provide efficient port facilities and deliver quality services to [its] customers".

It is against the background of massive growth in maritime trade leading to increasing generation of waste volumes both from ships and from the cargoes they are carrying that the issue of waste management is causing great concern for modern ports all over the world.

Introduction

Based on the premise that "waste management encompasses all the activities and actions required to manage waste from its inception to its final disposal", this case study attempts to take stock of how ships' waste is managed at the present time in the port of Tema. It assesses the effectiveness of current practices and benchmarks them against best practice. The dissertation paper also looks at the challenges facing port managers in moving to a better system for managing waste in the future and makes recommendations in that regard.

The definition of waste management for Tema Port is taken to include: "amongst other things, collection, transport, treatment and disposal of waste together with monitoring and regulation." The guiding principle is that "where waste cannot be avoided, it should be recovered, reused, recycled and treated. Waste should only be disposed of (in land fill) as a last resort".

Analysis

The case study draws on lessons from best practice in ports operating as best-in-class exponents of quality assured waste management systems. The research was done through field visits to the port and to the premises of all seven licensed waste management companies operating out of Tema. Survey forms were completed using ten criteria to determine how each operator scored in terms of availability of necessary resources and equipment and the adequacy of their capacity to handle waste products from ships.

Waste product generated on board ships is categorised in accordance with the *International Convention for the Prevention of Pollution from Ships* (MARPOL) 1973 as modified by the Protocol of 1978. The MARPOL Convention is probably the most important international marine environmental convention. It was developed by the International Maritime Organization with the objective to minimize pollution of the oceans and seas, including dumping, oil and air pollution.

Figure 67: MARPOL 2017 Consolidated Edition

Failure to treat and dispose of ships' waste properly damages precious ecosystems and threatens essential natural resources. Marpol Annex V groups shipboard waste into nine categories covering: Plastics, Garbage, Domestic, Cooking Oil, Operational wastes, Cargo residues, Animal cargoes and Fishing gear. Each category has a given procedure setting out how it must be managed and treated in the best interests of the environment

The case study discusses the approach adopted in British Colombia, Canada, in a report entitled "Resources from Waste: Integrated Resource Management Study" which proposed using solid and liquid waste to create energy, reduce greenhouse gas emissions, conserve water and recover nutrients. This approach, known as Integrated Resource Recovery (IRR), advocates a waste management hierarchy, see Figure 68 below.

Waste prevention is the preferred approach to waste management. It involves either avoiding the generation of waste entirely or reducing the quantity produced.

The Waste Management Hierarchy introduces five strategies for managing waste as follows:

1. Reduce: cut down on packaging or use more efficient processes that reduce waste.
2. Reuse: materials can be reused to prevent them becoming waste. Return reusable glass bottles for re-filling and re-sale as was common practice up to the 1960s in Europe.
3. Recycle or compost: this method requires segregation of materials such as metals, plastics and paper products which can all be recycled and turned into something else for example tyres are used to make garden furniture.
4. Recovery: dredged material recovered from a river or seabed can be de-contaminated and used as infill for quay wall construction elsewhere in the port.
5. Disposal: landfill which was once the most frequently used method to dispose of waste is in decline in modern economies but still presents a major environmental hazard in less developed countries. Many countries have turned to incineration to deal with waste which would previously have ended up in landfill dumps. The combustion generates energy which can be fed into the national grid for households and industry.

Tema Port in line with its mission to minimise environmental effects associated with its operations has introduced an integrated Management System which includes a quality Management System (ISO 9001:2015), an Environmental Management System (ISO 14001:2015) and an Occupational Health and Safety Management System (OHSAS 18001:2007). Adhering to international standards helps to create awareness among all stakeholders about the ports commitment to protecting and enhancing the environment. Adherence to the standard is independently audited and corrective actions must be taken to maintain the internationally recognised designation.

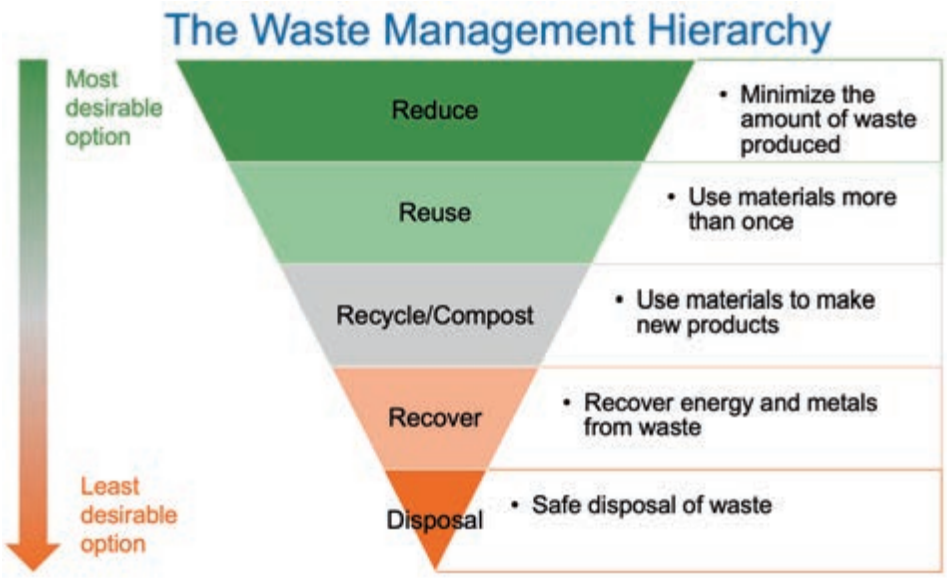


Figure 68: The Waste Management Hierarchy

Conclusions

The case study notes that there are seven licensed Port Waste Reception Facilities (PWRFs) whose role is to collect and properly dispose of segregated waste from vessels calling to Tema Port. Two of the PWRFs recently acquired bio-digester units which can turn organic waste, including sewage pumped ashore from tanks on ships, into fuel, and further reduce the amount of waste going to land fill.

The field research showed that the seven PWRFs operate different facilities and standards within their own private facilities when handling waste products. Capacity constraints mean that the PWRFs can only fully treat limited amounts of waste from ships and that far too much waste still goes to landfill.

The report notes that "collection and dumping (of ships waste) is undertaken by the private sector in an inefficient and hazardous way in the absence of proper risk management". Additionally, there are little or no safety measures in place for waste-workers such as immunizations and proper personal protective equipment.

Recommendations

The main recommendation is that Tema Port should view waste management as an opportunity to introduce Integrated Resource Recovery and thereby add value and provide much needed employment. Looked at this way output from ships' waste is considered to be inputs for other processes to enhance the natural environment.

Secondly, a path to implementation is recommended whereby Tema Port develops a modern integrated waste management plan incorporating a comprehensive integrated resource recovery plan with a priority on recycling and targets reductions in the final amounts of waste going to landfill.

Thirdly, Tema Port should publish and implement a formal guide to waste management in the port area. The dissertation paper provides an extremely useful guide and a list of the main topics that should be considered when drafting such a plan.

Sustainable Development Goals

In the 2030 Agenda for Sustainable Development, sustainable transport is mainstreamed across several SDGs and targets. The targets of relevance to this case study and its recommendations are especially those related to:

SDG 11 – Make cities and human settlements inclusive, safe, resilient, and sustainable

SDG 14 – Conserve and sustainably use the oceans, seas, and maritime resources for sustainable development

Managing all ships' waste in compliance with ISO Environmental Standards and MARPOL not only regulates the activities of licensed waste contractors but also will result in thousands of tonnes of waste which previously went by lorries to municipal dumps being treated locally and recycled. Hazardous ships' waste will no longer leach from landfill dumps and will not pollute the environment and ruin peoples' health when the runoff from the dump enters waterways. Treating the waste material within the port estate will reduce the volume and impact of HGVs traversing the road network bringing waste to illegal dumping grounds. Less HGVs means less emissions and a reduction in carbon footprint of the port's operations. Additionally, enforcement and monitoring of loading and unloading during and ship-to-shore operations will mean less product polluting the waterways. This will lead to a cleaner marine environment which aquatic life can thrive and provide improved fishing for local fishermen whose standard of living will improve.

E. NIGERIA

Statement of Ms. Bala Usman, Managing Director, Nigerian Ports Authority

Figure 69: Photo of Ms. Hadiza Bala Usman, Managing Director, Nigerian Ports Authority

"Having signed the 2007 Dublin Declaration as a pioneer member of the English-speaking network of the UNCTAD TrainforTrade Port Management Programme, and commenced local implementation of programme only in 2015, the Nigerian Ports Authority has made great strides to institute the programme into its system.

The appointment of Hadiza Bala Usman as Managing Director in 2016 was a great boost to the UNCTAD Port Management Programme. Identifying capacity development as a priority in her management agenda, she recognized the value of the UNCTAD programme and has since showed unwavering support by approving all UNCTAD-related matters. Consequently, the Nigerian Ports Authority Management has instituted the UNCTAD Port Management Programme as a vital tool for capacity development as exhibited in the following ways:

- *Approved provisions for the programme in the Authority's training plan and annual budgets,*
- *Celebrated and rewarded participants with excellent performance in the concluded Cycles,*
- *Approved and supported the provision of logistic resources for the implementation of successive Cycles,*
- *Supported the participation of NPA in UNCTAD international Coordination Meetings, Coaching* Workshops, Training of Trainers and Port Performance Scorecard Conferences,
- *Approved the implementation of Cycle 3, which is currently delayed due to the global COVID-19 pandemic.*

Management of Nigerian Ports Authority is fully aware that the UNCTAD Port Management Programme is designed for the greater benefit of the Nigerian port community and is committed to playing its pivotal role to develop the human capacity of the Nigerian maritime industry. To this end, it has encouraged the participation of stakeholders in the programme and supported the development of a pool of local resource persons to enhance the local content of the pedagogic sessions. The benefits of the shared knowledge among participants from a cross section of the port community are already becoming evident through effective collaboration among past participants. It is envisaged that members of the port community will sustain the UNCTAD Port Management Programme through their greater participation.

The CEO of NPA, Hadiza Bala Usman is committed to entrenching the programme and has rewarded excellent performers in the past 2 Cycles as pledged, through further training exposures and responsibilities. She has also encouraged the initiation of a succession plan for the sustenance of the PMP, where successful participants of the past Cycles are being groomed to take over the management of the local steering Committee.

Following the participation of its officers at the 2018 Performance Scorecard Conference in Geneva, NPA Management took note of, and immediately implemented some of the recommendations of the conference."

Overview of Nigerian Ports Authority[11]

With an area of 923,000 square kilometers of land ranging from the southern fringes of the Sahara Desert, across the Sahel and Guinea Savanna to the coastal rainforests in the Gulf of Guinea, as well as an 853 km coastline along the Atlantic Ocean, the Nigerian ports systems consists of six major ports distributed on its four navigational channels, the most prominent of which are the ports of Lagos, which include the Lagos Ports Complex, Apapa and Tin Can Island port.

[11] Section provided by the Nigerian Ports Authority.

In 2006, Nigerian Ports Authority adopted the Landlord Port model, ceding active cargo handling to the private sector, which currently operate the 6 ports through 26 terminal Concessions.

1. Lagos Ports
2. Tin Can Island Port
3. Rivers Port, Port Harcourt
4. Onne Port
5. Calabar Port
6. Delta Ports, Warri

Total Cargo throughput in 2019 for the six ports was 80,201,329 metric tonnes. The Lagos ports of Apapa and Tin Can Island handled over 70% of the general cargo, containers, RoRo and dry bulk.

Total personnel strength of the Authority currently stands at 3,961.

Onne Port, located in the Oil & Gas Free Trade Zone in South-South of Nigeria, was established on the Landlord Port Model to serve the oil and gas industry. It currently generates the highest oil and gas cargo throughput of the country.

The prevailing challenges of the Nigerian Ports are infrastructural deficiency, undeveloped intermodal facilities and poor inland connections. The institutional challenges of government interference and lack of enabling frameworks to allow for the efficient running of ports are also prevalent.

Outlook: Government is encouraging the trend of deep-water ports and other infrastructural developments through public-private partnership (PPP) schemes. Presently, there are over six deep-water Greenfield port proposals being processed for delivery on the PPP basis.

Figure 70: Onne Port on the Bonny River Channel

An Assessment of Noise Pollution on the Health of Port Workers: A Case Study of Dangote Sugar Refinery, Greenview Terminal, Lagos Port Complex

Author of the case study: Ms. Halimatu Abdul, Senior Manager - Occupational Health, Nigeria Ports Authority

Mentor: Ms. Eunice Ezeoke, Assistant General Manager Tariff and Billing, Nigeria Ports Authority

Figure 71: Photo of Ms. Halimatu Abdul (author, left) and Ms. Eunice Ezeoke (mentor, right)

About the author

Encouraged by her supervisor to apply to the UNCTAD programme, Ms. Halimatu Abdul was curious.

> "I wanted to know more on how ports work, and my colleague was in Cycle 1 of the programme. He shared his experiences with me, which have been exceptional. I also picked some of the training materials to read and I knew then that this is one programme I would like to be part of. I am so happy I did because the programme answered almost all of my questions and gave me better insight on port activities.
>
> Honestly, it was so worthwhile of my time and I wouldn't mind going through it again. The UNCTAD programme gives you exposure. When you work, you are more into your general departmental work, but this programme gives you the bird's eye view. It has broadened my horizons and knowledge. Each module of the programme deals with every aspect of the port and all of these aspects are very important for a port to perform optimally and effectively. I take cognizance of this when I have to make a decision."

Ms. Abdul expressed that the UNCTAD programme had a lot of impacts.

> "It has helped in no small way in carrying out my duty as an HSE practitioner within the port because now I realised a lot still needs to be done for NPA to be among the 5 best ports in the world in regards to Health, Safety and Environmental best practice, which is my aspiration."

As for her case study work, Ms. Abdul picked up noise pollution, which is under her responsibility. "I saw the problem in my work but up until then, the way we tackled it was reactive, not solving the problem at the root. I was determined to solve this key problem", she said.

Currently, Ms. Abdul's recommendations are being discussed with management and in the process of implementation.

According to Ms. Abdul, the programme also served as a networking platform for participants.

> "It was wonderful to meet and work with other colleagues. In our normal daily work, we would not have a chance to interact that much. However, in this course, we became friends. I was selected as the Deputy President of the class and part of the responsibility was to unite the class."

It seems that Ms. Abdul's involvement in the UNCTAD programme will not stop here. "Being among the best 3 participants, we were told that we will have a role to play in Cycle 3. We are looking forward to it", she said.

Background

The Nigerian Ports Authority (NPA) began operation in 1955 and by 1969 all NPA ports (public and private) were brought under the control of the Federal Government. In 2006, the NPA franchised out control of its operational activities to private operators and companies through concessions for periods of up to 25 years. The NPA has now been operating as a landlord for over 13 years. It oversees 26 terminals operated by private concessions.

Introduction

The restructuring of NPA revolutionized its port complexes. There are now many industries and production plants within port estates. This increase

in port activities has resulted in increases in traffic, machinery, and noise, exposing port employees to adverse working conditions. Greenview Nigeria Limited leases the concession at Terminal E, Lagos Port Complex and operates the Dangote Sugar Refinery (DSR) on the site. The DSR is the largest sugar refinery in sub-Saharan African and has the capacity to refine 1.44 million metric tonnes per annum. It operates 24 hours a day, employing 952 staff in two shifts. The sugar produced is transported daily by large trucks out of the port complex. It is a lucrative refinery and in 2018 reported a profit after tax of over US$102 million. There is a strategic plan in place to expand capacity to over 2.5 million metric tonnes.

Some of the machines and equipment in use at the refinery produce noise that can be harmful to the employees' health. A high level of exposure to occupational and environmental noise can result in hearing loss, high blood pressure, sleep disturbance, stress, myocardial infarction and, in some cases, stroke. In Nigeria, the *National Environmental Standards and Regulations Enforcement Agency* (NESREA) restricts factory noise above 85 decibels (dB) over a period of eight hours as it is dangerous to be exposed to noise levels above this for a prolonged period.

Analysis

As part of this case study, 142 participants who were drawn from those working in noise prone areas in DSR operations and production, as well as other port complex workers in adjoining terminals who are exposed to associated environmental noise were surveyed. Participants were surveyed regarding their past and current medical history in order to assess the impact on their health of working in or near DSR. Additionally, 138 participants submitted to an audiometric pure tone test to evaluate their hearing ability, and all participants took a thermogram stress test to identify if any exhibited early signs seen in individuals exposed to high levels of noise at work.

When surveyed, 94% of respondents reported that they considered their workplace noisy. 54% were exposed to noise from machinery within the refinery, while 25% indicated they were exposed to noise from traffic. The remainder were exposed to noise from other sources.

The sound level at DSR was measured at four different locations: at 10 metres away from the production area inside the refinery; 30 metres away from the refinery; beyond the perimeter fence of DSR at the APM Terminal and common user area; and at the adjacent truck park.

Figure 72: Photo of noise measurement at the Dangote Sugar Refinery Boiler Room

The survey showed that workers are exposed to noise pollution of 116 dB. This is significantly higher than the internationally accepted standard of 85 dB.

The majority of participants reported that they had no hearing test prior to their employment at DSR/NPA and those that reported having had hearing tests (19%) could not provide their results. This prevented a baseline analysis of participant hearing.

A little over half of those surveyed (58.5%) had at least one form of ear protection. Given that this protection is provided by DSR management, it is considered inadequate as the remaining 40% of participants had no ear protection. It was noted that the NPA does not provide ear protection to its employees.

Analysis of the stress test results found that 53 participants (37%) had signs of high levels of stress and 89 (63%) tested normal. This is in contrast to the participant survey, which indicated that 45.8% of those employed in the engineering department suffered from stress, and over all 96 participants (67.7%) reported that they were stressed. It was also found that half of all respondents believed that noise was affecting their performance at work.

Hearing loss was also found to be a problem where 23.2% of participants are currently having trouble hearing, mostly those employed with the operations department. 64 participants (45%) said that exposure to noise at work is affecting their health as they no longer hear clearly when being spoken to in a lower tone. They say they are stressed and drained after work because of noise levels. On the other hand, 37% of participants felt no impact from noise levels at work and 18% were undecided. The results of the audiometric

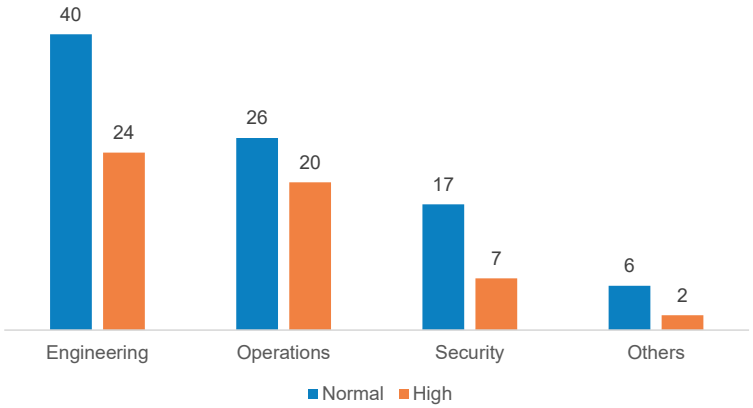


Figure 73: Results of participants stress tests per department

tests show that 38% of participants are within the acceptable range, but that 39.4% were found to have rapid hearing loss, which if not effectively managed could lead to irreversible, permanent hearing loss.

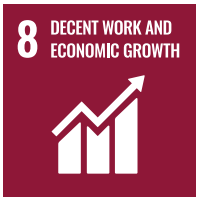
Recommendations

Noise pollution at DSR is at unacceptable levels according to both national and international standards. This needs to be tackled in order to ensure the health of employees and ensure that the DSR can pursue future expansion. The following steps should be taken to remedy the situation:

- DSR should design an effective health and safety policy framework to reduce hazardous work environments. Employees should also be educated on the risks of long-term exposure to noise.
- Hearing tests should be carried out on all DSR workers to identify those at risk and prevent employees from developing hearing damage due to prolonged exposure to high noise levels.
- All future employees should undergo pre-employment health-status screening to establish a baseline for their health at the outset of their employment.
- All DSR and relevant NPA employees that work in high-noise areas should be provided with adequate ear protection.
- The DSR should provide noise-free havens within the refinery so that workers can take regular breaks from areas of high-noise.
- The NPA should adopt a systematic approach to noise management, including a structured approach to noise mapping and abatement by introducing a noise management system. It should implement a version of the Noise Management System in European Ports initiative (NoMEPorts) under the acronym NoMNPorts – Noise Management System in Nigerian Ports.
- The NPA should enforce its oversight over terminal operators to ensure that there are no violations of health and safety laws with port complexes.
- There is a need for a regulatory policy on heavy duty equipment and machinery operating in the port specifying the type and acceptable noise level from them. This should be made available to all port stakeholders.
- Appropriate speed limit signage should be conspicuously placed within the port perimeter to prevent speeding thereby reducing noise from vehicular movement, as well as noise from truck horns.
- The NPA should introduce a hearing conservation programme and ensure compliance from all terminal and concession operators.

Sustainable Development Goals

The targets of relevance to this case study and its recommendations are those related to:



SDG 8 –- Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

Target 8.8[12] covers the promotion of safe and secure working environments for all workers. This is linked to indicator 8.8.1[13] looking at rates of fatal and non-fatal injuries to workers. Ensuring that DSR workers are adequately protected from high noise levels helps to look after their health and wellbeing and ensures that they will not suffer from hearing loss and other health risks associated with noise pollution. Implementing NoMNPorts will reduce the stress and concern that employees feel when confronted with noise levels affect their work performance.

Implementation update

The recommendations set out in the dissertation have been presented to senior management and an implementation roadmap has been agreed in three phases. Consideration has been given to decisions to replace existing equipment, structural changes in certain buildings and even new building construction. Even though the outbreak of Covid-19 has slowed down progress, two immediate goals have been achieved as follows:

- A newly formed 'Job Hazard Analysis Committee', of which Ms. Abdul is a member, has been given the remit to examine and report on all hazards inherent in jobs performed across all employee sectors in Nigeria Ports Authority.
- All employees that are exposed to noise in the course of their work are now provided with relevant and effective PPE.

[12] Protect labour rights and promote safe and secure working environments for all workers, including migrant workers, in particular women migrants, and those in precarious employment.

[13] Frequency rates of fatal and non-fatal occupational injuries, by sex and migrant status.

An Assessment of the Effectiveness of Nigerian Ports Authority Land Management System

Author of the case study: Ms. Nneka Chiedozie-Udeh, Senior Manager, Estate, Nigeria Ports Authority

Mentor: Ms. Margaret Ogbuitepu, Principal Manager, Legal, Nigeria Ports Authority

Figure 74: Photo of Ms. Nneka Chiedozie-Udeh (author, left) and Ms. Margaret Ogbuitepu (mentor, right)

About the author

Ms. Nneka Chiedozie-Udeh talked about her motivation in lifelong learning and self-development:

> "The original inspiration comes from a young age because of my father. He inspired me so much. He would go through my textbooks himself and ask questions. He also encouraged me to read a lot.
>
> As an enthusiastic and challenge-driven person, I like acquiring new skills and knowledge so as to be updated in my chosen career. This has motivated me to participate in various training courses within and outside Nigeria. So, when I heard about the UNCTAD Modern Port Management training from Cycle 1 participants, I asked questions and was told it was very good but challenging. With that, I knew that the UNCTAD Programme would give me the platform to research and an opportunity to proffer solutions to the various Land Management challenges, which is my daily work."

Her female colleagues played an important role in supporting Ms. Chiedozie-Udeh through the UNCTAD journey not only this one time.

> "There were six ladies in the class, and we studied together. When you read, you cannot remember everything. So, each time the lecture finished, we would discuss and exchange what we learned as a conversation. This was extremely effective."

"In the 1st Cycle, the best dissertation was from a female participant. I remember saying to the group at the orientation that 'Pass me the baton, a woman will be on top!'", said Ms. Chiedozie-Udeh. And indeed she collected that baton, graduating as the best participant in her year.

> "I remember my dissertation presentation was on my birthday and I remember not sleeping very well a night before because I was nervous. I even stayed at a hotel the night before to make sure that there won't be any disturbance from family."

When she learned about her achievement, Ms. Chiedozie-Udeh was overjoyed. "That became the best birthday gift so far", she said.

"As someone who believes in gender equality, I think we need more female role models especially in top management", said Ms. Chiedozie-Udeh. She also mentioned her mentor, also a female colleague, who helped her a lot through the process and was helping her to get the dissertation presented to the management. Ms. Chiedozie-Udeh does not want the baton to stop here. "I'm ready to mentor! And I want to continue further education to educate people", she said.

Background

The Nigerian Ports Authority (NPA) was established under the *Nigerian Ports Authority Act* (1955). It is governed by a Board of Directors. The Chairman and members of the Board are appointed by the President on recommendation of the Federal Minister for Transport. The structure of executive management of the NPA is a Managing Director over three Executive Directors who are each responsible for key areas of the organization. Each directorate consists of divisions headed by a General Manager who oversees departments managed by Assistant General Managers.

Introduction

In 2006, the Nigerian Federal Government transferred some of the NPA's functions to the private sector to reform and improve efficiency in Nigerian ports. The

Figure 75: Photo of the author (standing, 2nd left) with the team of researchers

role of the NPA was changed from cargo handling operations to a landlord type regulatory function. The NPA retained ownership and management of land and infrastructure, although the superstructures within the ports are built and operated by private companies. NPA's land properties are one of its primary revenue generating assets as rent is paid for use of the properties on multi-term leases of between one and twenty-five years. Effective management of the port lands is therefore crucial to the NPA's goals and vision.

This case study sought to assess the effectiveness of the current land management system. The focus was restricted to the Lagos area as the majority of NPA leases refer to this area and the Land Administration Office is based at the Lagos Ports Complex. Assessing the NPA's land management was challenging. Many of those who leased land and property from the NPA were reluctant to provide information. Similarly, there was a reluctance by many of those considered illegal occupants by the NPA. They would only talk to the research assistants who they assumed to be non-governmental organization workers.

Analysis

The *Nigerian Ports Act* restricted the authority of the NPA to lease its land holdings without the written authority of the President, although leases of less than five years could be approved by the Managing Director.

There were no identified principles and procedures for land management although it was found that leases for NPA properties were standardized and that reviews are scheduled to take place every three years. However, a review has not occurred since 2013.

Whenever the NPA acquires property through public acquisition it is required to:

1. serve a notice of intent to acquire, followed by a notice of intent to take possession, and the publication of both notices in a gazette (newspaper),
2. pay compensation for the property, and
3. ensure the land is used for a public purpose.

However, these procedures were not always followed, and this had led to inadequate security of tenure for tenants. In some cases, the original owners were not served notice, while in others full payment for the property was never made. Furthermore, sometimes the NPA only took partial possession of properties, leaving some exposed without perimeter fencing. These issues have caused litigation – there are currently several properties involved in litigation as a result of non-secured titles – and encroachment.

Encroachment is one of the primary concerns caused by this inadequate security of tenure. A review of encroachment on NPA properties showed that cases mainly arose from the following categories:

1. the original families from whom the land was acquired
2. individuals who claimed they bought the land from original owners
3. encroachment by individuals with no previous involvement
4. use by government authorities such as the Nigerian Army and Nigerian Navy, for example the navy occupies over nine hectares in the Rivers Port Complex.

In order to understand encroachment in the Lagos Port Complex, 74 households in the Tarkwa Bay encroachment area were interviewed. Over 36.6% had been on the land for over 30 years and 25% said that they had been allowed to stay on the land temporarily by NPA staff. With regard to land ownership, 48% claimed that they had purchased their property from the Onisiwo family. The occupants were also of mixed ethnicities: 9.5% originated in the Republic of Benin and 2.7% were from Ghana and Togo. Of the Nigerians occupying the encroached area in Tarkway Bay, over 50% were from states other than Lagos. Only 10.8% revealed that the NPA had tried to evict them while the vast majority had not experienced any threat of eviction.

An efficient land management system should provide up-to-date survey plans and provide a basic framework for planning and development of NPA properties. Currently, managers use their discretion to allocate land as long as the proposed use is port related and fits into existing land use in the area. Furthermore, the amount of rent a tenant pays is not based on current surveys and measurements.

Key to an efficient land management system is recruitment and training of qualified staff. In the NPA Lands department, it was found that only 3% of staff had specific land administration training and only 9.4% were trained as planners. Land managers have only a minimum knowledge of land use, land administration and geographic information systems. This means there is a shortage of appropriate officers who can adequately manage NPA properties.

All NPA leases have an environment clause with requires all lessees to comply with laws preventing pollution and illegal waste disposal. They are also required to prepare and implement a removal and remediation plan for hazardous materials. However, once the term of the lease has ended, this clause does not apply and there is no provision for an environmental assessment prior to renewal or surrender. This means that a lessee can surrender contaminated land to the authority.

The NPA Land Information Management System at Lagos Marina was observed. It was found that different port estate offices were often called upon to update their schedule of leases in Microsoft Excel spreadsheets. The land records files and survey plans were also kept in hard copy on shelves accessible by Estate Officers. These files are coded and numbered according to their subject areas. Only one clerical officer was deployed to manage the land record office and cater to the needs of ten Estate Officers as well as the Assistant General Manager of the Lands and Estates Division. The Estate Record Office is inadequately staffed and the fact that the files are openly accessible means that they can be easily lost or mixed up. Additionally, it was observed that there was no uniform format for recording and reporting the schedule of leases. Some ports have detailed records, but others do not.

Figure 76: The current file management system in the Land and Estates Department, Marina, Lagos

Recommendations

After analysing the effectiveness of the current NPA Land Management System, the following recommendations were made in order to improve efficiency:

1. Managers should be trained on modern land management systems.
2. More clerks should be deployed to land records management and training provided on electronic document management systems.
3. The NPA should develop a comprehensive policy and procedures for land management.
4. A database of all land parcels with accompanying surveys and relevant data should be created.
5. Improve property management through efficient, comprehensive valuation and tracking of land transactions. This will also increase revenue from rentals.

Sustainable Development Goals

The targets of relevance to this case study and its recommendations are especially those related to:

SDG 11 – Make cities and human settlements inclusive, safe, resilient, and sustainable

Target 11.3[14] which speaks to the need for 'sustainable human settlement planning and management' and identifies the ratio of land consumption rate to population growth rate is linked to proper land management proposals put forward in this case study.

Creating an efficient system to manage NPA residential areas and properties will ensure equitable management of the land for landlord and tenant. Implementing an environmental assessment on all properties will ensure that lessees adhere to the environmental clause in their lease and do not contaminate the land with waste materials which may damage the soil and contaminate the nearby waterways.

[14] By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries.

The Impact of Traffic Gridlock along Creek Road and Wharf Road on Cargo Dwell Time at APM Terminal, Apapa, Lagos Port Complex

Author of the case study: Mr. Bukar Kaumi, Senior Manager and the Port Security Officer, Lagos Port Complex, Apapa, Nigeria Ports Authority

Figure 77: Photo of Mr. Bukar Kaumi (author)

Mentor: Mr. Benjamin Humbe, Principal Manager Traffic, Nigeria Ports Authority

Figure 78: Photo of Mr. Benjamin Humbe (mentor)

About the Author

When asked about his experience with the Port Management Programme, Mr. Bukar Kaumi said:

> "The UNCTAD programme enabled me to know much more about modern administration and management of ports for better efficiency. The UNCTAD training programme made me understand the importance of port reforms and further strengthened my knowledge and ability to add value to the system.
>
> I was motivated to join the Modern Port Management programme. I saw it as an opportunity to advance my knowledge and contribute to adding value to the port system in Nigeria. I also heard before from participants from Cycle 1 that this programme will be a very serious business. I think I was so nervous I did not do well at first. However, quickly I decided to study hard."

Through his perseverance, the efforts paid off. Mr. Kaumi graduated among the top of his class. "I have good memories. My classmates were incredibly open. We interacted a lot and shared knowledge. I am sincerely happy that I joined this course. It was so impactful", he said.

As for his case study, Mr. Kaumi chose to work on a pressing problem that gives value to his work.

> "As I am Head of security at the Lagos port complex, I take this opportunity to do research that has an immediate impact in my day to day work. I could use the data from my findings almost right away in meetings. I think future participants of the programme should note that it is important to identify key problems that the port authority wants to address, on-going problems not theoretical ones, so that your work can be implemented and you feel motivated to bring about solutions."

Mr. Kaumi's dissertation recommendations are under implementation. The challenge of delay of ICD containers along the port access road is addressed officially and more efforts are being made to use barges in transporting containers to the port.

For Mr. Kaumi, self-development and lifelong learning never stops. He got trained in several security courses as well as obtained a Port Facility Security Officer (PFSO) certificate from the International Maritime Organization. He is presently studying for a Master's in Security Intelligence at University of Lagos. "I always seek the knowledge to do the job professionally", he said.

Background

The Nigerian Ports Authority (NPA) is a federal government agency that governs and operates the ports in Nigeria. The Lagos Port Complex is the oldest and largest port in Nigeria. It is situated in Apapa. In 2006, the NPA adopted the Landlord Model of port management, and port operations in Apapa were taken over by private concessions.

Prior to port concession, the NPA had truck transit parks for the temporary parking of trucks while waiting to load. However, these spaces are now leased to terminals meaning that trucks end up queuing and parking along roads outside the port. This reduces available road space, creating bottlenecks. Additionally, road construction along Creek Road and the closure of Liverpool Road has severely reduced road capacity. A survey by the Nigerian Shippers Council found that 7,000 trucks use the Lagos Logistics Ring Road daily, which includes Apapa, and determined that only 2,500 of those trucks have genuine business in the port. This case study looks at the traffic gridlock on the two roads into Apapa, Creek Road and Wharf Road, to examine its impact on cargo dwell time.

Introduction

Coastal countries have an economic advantage over those that are landlocked. In West Africa, Nigerian Ports currently benefit from a captive market in their landlocked neighbours. However, this situation is changing as there is now competition from ports in Benin (Cotonou Port), Ghana (Tema Port) and Togo (Lome Port). These ports are attracting regional traffic and are becoming transhipment ports for interior countries. These ports have the advantage of better road networks and rail systems meaning they can provide efficient and cost-effective port services.

Operational efficiency ensures a quick turnaround time for vessels as well as a low cargo dwell time. It is dependent on factors such as sufficient manpower, provision of navigational aids, channel depth, suitable cargo handling equipment, infrastructure, and interconnectivity to the hinterland. For over a decade, the Lagos Port Complex has been experiencing serious traffic gridlock. An increase in operational activities has seen a corresponding increase in high volumes of vehicular traffic without commensurate investment in infrastructure. The roads are in a poor state of repair and this, coupled with an inadequate traffic management policy, has contributed to traffic gridlock, and impacted on the competitiveness of NPA ports.

The impact is most notable in cargo dwell time and the resulting delays prevent customers (importers and exporters) from meeting contractual obligations. A report by the World Bank indicated that Nigerian Ports have the worst cargo dwell time compared to other ports in the region. The report noted that this is stalling trade and causing consumer price inflation as the increased costs incurred by cargo dwell time are passed on to customers. The President of Dangote Group, operator of Terminal E in Lagos Port Complex, estimated that the Nigerian economy is losing 140 billion Nigerian Naira (approximately US$385 million) weekly because of traffic gridlock in Apapa. A World Bank report also notes that NPA has the lowest penalty charges compared to other ports in the region for containers and other cargo using the port estate as a storage area beyond the permitted period.

Creek and Wharf Roads are two major roads linking Apapa Port to its hinterland. They are dual carriageway roads. From the port gate, Creek Road is 2.5 km and terminates at Liverpool Bridge while Wharf Road is 2.4 km and terminates at Marine Beach. Along these roads, there are several private businesses such as banks and petroleum tank farms. However, due to rapid port development, the two roads are stretched beyond capacity and are collapsing due to lack of regular maintenance.

It has not been possible to quantify other factors that cause delay such as vehicle and equipment breakdown as there are no available, reliable data. Additionally, some companies were reluctant to participate in this study.

Analysis

The average cargo dwell time at APM Terminal in 2011 was chosen as the baseline for this study. At that time, the road network connecting to the hinterland was good and traffic was free flowing. Data from 2014-2018 was compared against this baseline. As the following chart shows, by 2018, average cargo dwell time had increased to 20.8 days from 10.8 days.

The number of trucks along Creek and Wharf Roads was counted. At the time these roads were surveyed, 140 trucks were counted on Creek Road and 285 trucks were on Wharf Road. However, it should be noted that this number increases when trucks form a queue in more than one lane.

Truck Turnaround Time refers to the amount of time taken for a truck conveying cargo to complete a process and/or reach a destination. Under normal circumstances, the average inward and outward journey should be around 30 minutes. The data analysis showed that one truck took over a day to

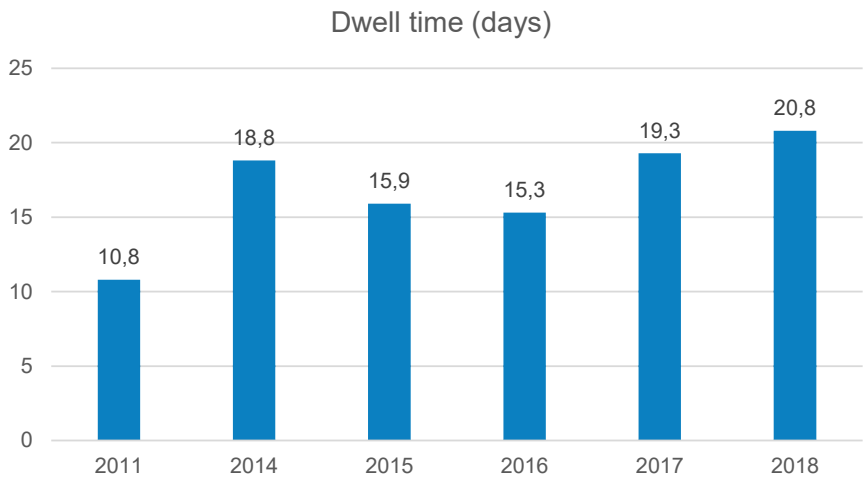


Figure 79: Cargo dwell time from 2011 (baseline) and 2014-2018

complete its inward journey to the port. On the same day, a truck travelling outward took over 20 hours. By contrast, on another day, a truck took 19 hours to complete an inward journey while an outward journey took just under 3 hours. The disparity in this case was found to be caused by a broken-down truck on Creek Road. Such breakdowns inhibit steady movement of trucks in both directions, causing standstill and creating a high level of truck idle time.

Another contributor to cargo dwell time is operational stoppage within the port caused by traffic gridlock in the terminal. Operational stoppage at APM Terminal usually occurs when the movement of trucks outbound comes to a standstill and the queue extends back to the ATM Terminal Exit Gate, preventing trucks from leaving the terminal. Figure 80 below shows that in the six months analysed over 936 hours working time delay (equivalent to 1 month and 8 days) was caused by gridlock.

An analysis of 100 questionnaires completed by stakeholders (freight forwarders, transporters, terminal operators, shipping agents and public servants) revealed that they considered traffic gridlock was due to the poor state of the roads. Additionally, the freight forwarders and transporters indicated that demurrage and other charges incurred by cargo dwell time was having a serious impact on their business. The respondents also pointed to systems failures

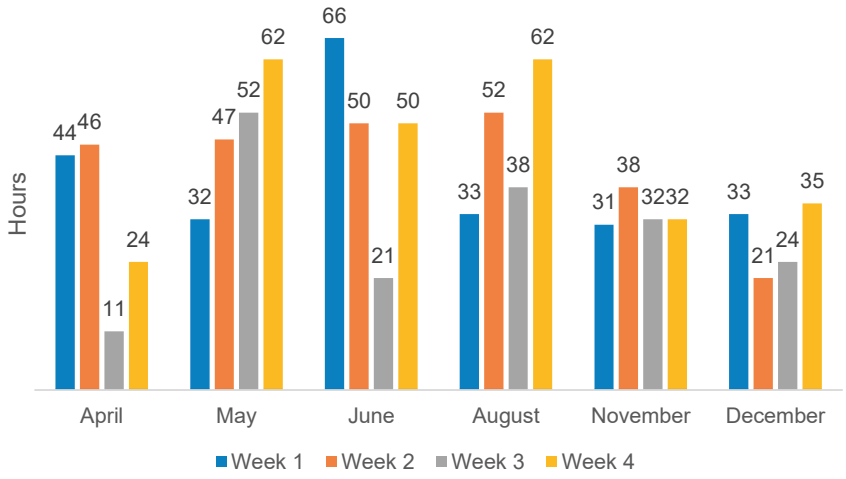


Figure 80: Operational Stoppages at APM Terminal for selected months in 2019

within the terminal as a major cause of traffic hold-ups and congestion in the terminal. The call-up system for trucks to be serviced came in for direct criticism. Shippers and forwarders also complained about the lack of space for holding empty containers leading to congestion and delays for truckers.

The study instanced figures for one day, 9 August 2019, when the terminal operator issued 3,665 Terminal Delivery Orders or instructions to hauliers to collect containers, and dockets for delivery of 365 containers to the terminal for export. These numbers are well in excess of the handling capacity of the terminal and therefore traffic chaos ensues.

Large numbers of trucks lined up with valuable cargoes provide ample opportunity for criminal activity. The case study reveals that many truck drivers have been intimidated and robbed and have had their cargoes stolen while parked up waiting to be serviced.

The toll on the environment and health of local residents is enormous due to dust, noxious fumes and carbon dioxide emanating from the HGVs burning diesel while they stop, start and queue for long hours. Noise pollution from engines, oil spills from poorly maintained vehicles and over-loaded trucks causing damage to already poorly maintained roads are some of the deadly impacts arising from congestion in the port. The report notes that HGVs damage drains running alongside the road network and this contributes to large scale flooding during heavy downpours making life even more difficult for inhabitants of the area.

With the main problems identified, the study turns next to identifying why no significant actions have been taken to manage and eliminate the gridlock. Several efforts have been made over the past ten years by the Federal Government, the Lagos State Government and the NPA to solve this persistent problem in Apapa Port. However, promising short-term results were not followed through with permanent changes. The research suggests that a lack of political will to enforce and sustain policies that work in the short term is one reason why the gridlock persists. The author contends that the primary cause of the consistent failure to address the issue on a long-term basis is related to a behavioural trait in Nigeria which focuses on short termism to the detriment of long-term change. Reference is made in the study to 'Hofstede's Dimensions Theory', on the influence of culture on the behaviour of citizens who exhibit respect for traditions with little propensity to plan or save for the future and mainly focus on quick or short-term results.

Recommendations

It is necessary to take immediate action to rectify the issue of traffic gridlock in the Lagos Port Terminal. The following solutions have been identified:

- Large numbers of trucks are parked for several days along the 1.6 km port access road while waiting for a Customs escort. The NPA should encourage customers to escort the containers in a timely manner.
- The sheer number of checkpoints (Customs, Local and Federal Government Collects) along the road impedes traffic flow. The NPA should liaise with relevant groups to reduce the impact on traffic flow.
- Freight forwarders do not take delivery at night due to fear of theft or pilfering, and trucks are parked along port access roads overnight. The NPA should engage port and state police to provide a more secure environment.
- It was observed that the present manual call-up system used to schedule the movement of trucks is being abused. The NPA should introduce an electronic calling system.
- The NPA and Shipping Council should implement a moratorium on container detention fees accrued by traffic gridlock. This will stop the practice of rushing to the port to return empty containers to avoid detention fees.
- The NPA should embark on the education of stakeholders with a view to re-orient their thinking on the implementation of long-term solutions to the problem.

Sustainable Development Goals

The targets of relevance to this case study and its recommendations are especially those related to:

SDG 9 – Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

The building of quality, reliable and sustainable infrastructure to support economic development and human well-being with a focus on affordable and equitable access

for all is a target of SDG 9. Furthermore, a recent SDG progress report from the UN has welcomed the fact that financing for investment infrastructure has increased in developing countries, while at the same time noting that the least developed countries lag behind in investment terms. Improving the quality of the roads into the Lagos Port Complex will have a positive image on traffic gridlock and cargo dwell time and provide sustainable infrastructure that will allow the port to remain competitive. So, together with SDG 11's targeting of reductions in carbon and air pollution, the recommendations of this case study are clearly in accord with the developments sought by the sustainable development goals.

CONCLUSIONS

UNCTAD is proactive in delivering on the Sustainable Development Goals

UNCTAD's Port Management Programme brings together a network of people working in ports around the globe in a spirit of co-operation and partnership. This 8th edition of the UNCTAD TrainForTrade Port Management Series features fifteen of the best dissertations researched, produced and presented by staff working in English speaking port communities in Africa and Asia.

Ports are key facilitators of international trade and many of the papers featured in PMS volume 8 demonstrate just how seriously port managers take their responsibilities when it comes to implementing the SDG targets and indicators.

UNCTAD's commitment to delivering on the Sustainable Development Goals is clearly stated as follows:

> "The 2030 Agenda for Sustainable Development is a global plan of action for people, planet, and prosperity, which demands an entirely new level of international partnership in pursuit of the future we all want. With more than fifty years of trade and development expertise and experience, UNCTAD is already implementing a number of the Sustainable Development Goals. The two areas of critical importance to this transformative agenda where UNCTAD contributes most, are Partnership and Prosperity."

The network of sponsoring ports from Ireland together with the ports in developing countries combine to create a powerful vehicle which can support UNCTAD's goal of contributing to delivering on several key targets of the SDG Agenda.

The Report of the Secretary-General of UNCTAD to the fourteenth session of the United Nations Conference on Trade and Development[15] underscores four action lines needed to fulfil the ambitions of the 2030 Sustainable Development Agenda:

- Building productive capacity to transform economies
- More effective States and more efficient markets
- Tackling vulnerabilities, building resilience
- Strengthening multilateralism, finding common solutions

Through these actions, in total, UNCTAD contributes to progress on fifty-two specific SDG targets, grouped under ten of the seventeen Sustainable Development Goals.

The SDGs addressed in the case studies

The case studies in PMS volume 8 list fifteen cases where one or more of the targets and indicators put forward in the SDG programme are clearly identifiable. In some cases, actions have already taken place while in others, recommendations have been approved and implementation plans have been drawn up. The most common SDGs referenced in the case studies are (number of occurrences in brackets):

SDG 8 Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all (5)

SDG 11 Make cities and human settlements inclusive, safe, resilient and sustainable (4)

SDG 9 Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation (3)

SDG 14 Conserve and sustainably use oceans, seas and marine resources for sustainable development (3)

SDG 6 Ensure availability and sustainable management of water and sanitation for all (1)

SDG 7 Ensure access to affordable, reliable, sustainable and modern energy for all (1)

[15] From Decisions to Actions, Report of the Secretary-General of UNCTAD to UNCTAD XIV, United Nations, 2015.

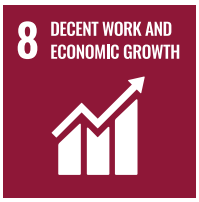
Figure 81: The most addressed Sustainable Development Goals

Projects undertaken in member ports pursuant to the case studies

The 2030 Agenda for Sustainable Development mainstreams sustainable transport across several SDGs and targets. The following section sets out some of the real examples of projects that are underway in ports who are members of the English-speaking network of UNCTAD's TrainForTrade Port Management Programme and that are reported above.

SDG 6 – Ensure availability and sustainable management of water and sanitation for all

SDG 6 calls for substantially increased water-use efficiency across sectors to address water scarcity and substantially reduce numbers affected by water scarcity. A case study in Johor Port Berhad, Malaysia delivers a rainwater harvesting system which will reduce the demand on the potable water supply by more than 9 million litres annually and encourage a self-sufficient, sustainable management system. The SDG 6 indicator 6.4.1 calls for a change in water use efficiency over time. This change is already happening in JPB. Implementing the recommendations proposed is also having an impact on reducing CO_2 levels by providing sufficient irrigation water for many thousands of plants and trees that absorb carbon from the atmosphere.



SDG 8 – Promote sustained, inclusive, and sustainable economic growth, full and productive employment, and decent work for all

One port terminal in the Philippines, Manila Port Harbour Inc., has introduced automatic spreaders to handle containers to increase productivity and improve the working conditions of dockworkers. Figures show there has been a 90% decrease in non-fatal accidents involving workers caught in tackle and that productivity increased by 45% on the container handling area. The improvement of the health and safety of workers is a key target of SDG 8 for "workers exposed to undue risks". Additionally, by providing specialist training for operatives, their skills and safety consciousness will increase and thereby improve their opportunities to benefit from better economic conditions along with the business.

Another initiative in the Lagos Port Complex, Nigeria covers the provision of better healthcare and well-being for workers facing damaging noise levels in their daily work. SDG target 8.8 covers the promotion of safe and secure working environments for all workers.

This is linked to indicator 8.8.1 looking at rates of fatal and non-fatal injuries to workers. Ensuring that a large cohort of workers working in or near a sugar refinery in Lagos Port Complex will be adequately protected from high noise levels helps to look after their health and wellbeing and ensures that they will not suffer from hearing loss and other health risks associated with noise pollution. Already, steps have been taken to accurately assess workers health and to supply all relevant staff with appropriate personal protective equipment. Implementing new standards of health and safety will reduce the stress and concern that employees feel when confronted with noise levels that can affect not just their work performance but all aspects of their life.

SDG 9 – Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

Another case study in Johor Port Berhad, Malaysia is a practical example showing how innovation and technology can drive important environmental gains. Efficient transportation services are key drivers of economic development and maritime transport is a critical enabler of trade. The volume of sea-borne trade in the seas around Johor and Singapore are increasing year-on-year. Increasing the reliability of Vessel Traffic Systems within the area controlled by Johor Port Authority, Malaysia will ensure that the port has the technical infrastructure to grow capacity in a safe and secure manner. The proposed state-of-the-art VTS which will operate on a 24 hours a day basis will help prevent vessel accidents at sea which result devastating damage to human and marine life.

SDG 11 – Make cities and human settlements inclusive, safe, resilient and sustainable

In the West Aceh area of Sumatra, Indonesia lies the small port of Meulaboh. Here a project is in hand to use ships to transport thousands of tonnes of produce currently moved by lorries. This has the potential to significantly reduce green-house gas emissions in villages of the region. The particulates from burning hydrocarbons are responsible for air pollution and damage the health of citizens. Reducing diesel fumes from HGVs will lead to an improved environment and a better health outlook for citizens affected by airborne pollutants. There is likely to be a significant decline in road injuries and fatalities as the number of lorries on the roads is reduced substantially. This project can also be linked to SDG 14 covering Life Below Water. Better regulation and monitoring of loading and unloading during ship-to ship and ship-to-shore operations will mean less product polluting the waterways. This will lead to a cleaner marine environment in which aquatic life can thrive and provide improved fishing for local fishermen whose standard of living will improve.

SDG 14 – Conserve and sustainably use the oceans, seas and marine resources for sustainable development

In the port of Takoradi, Ghana a project is being implemented which will eliminate oil pollution in the soil and waterways and recycle more than 40,000 litres of waste lubricating oil. Green port policies are beneficial to climate action and in this case study the recommended actions involve managing all waste lubricating oils from vessels and from port operations in compliance with ISO Environmental Standards and IMO MARPOL Regulations. The project includes new steps to regulate the activities of licensed waste contractors. These actions will result in 40,000 tonnes of hazardous waste oils being treated in accordance with best international standards and remove the threat of any on this product entering the soil of waterways and polluting them. It also means that properly treated product can be recycled and reused for future generations. This will lead to a safer and cleaner marine environment.

It can be clearly seen from the examples given above that the elements to develop and implement projects in ports which can have substantial environmental benefits within port communities in developing countries are in abundant supply. Employing the framework provided by the SDGs will provide a focus and a crucial justification in any cost benefit analysis which must take account of the environmental impact of such developments in the future.

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