

Republic of South Sudan
Ministry of Transport, Roads and Bridges

The Project
on
Monitoring Support and Improvement for the
Operation and Management
of Juba River Port
in the Republic of South Sudan
Completion Report

July 2017

Japan International Cooperation Agency (JICA)
The Overseas Coastal Area Development Institute of Japan

EI
JR
17-088

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1. Outline of the Project

1.1 Background of the Project

JICA cannot dispatch experts at the moment to directly support the improvement of river port operation due to the civil conflict in South Sudan. On the other hand, it is important to reinforce the know-how and skills acquired during the previous technical assistance conducted from 2011 and to follow up the monitoring activities. Furthermore, as JICA plans to extend a grant aid project for the installation of port facilities and equipment after peace and order are restored, supporting activities by experts are required for proper management and operation of such facilities and equipment.

1.2 Purpose of the Project

The purpose of this project is to ensure that the know-how and skills acquired during the previous technical assistance are maintained and to help facilitate the commencement of the grant aid project and succeeding technical assistance.

1.3 Outline of the Project

In this project, third country training (conducted at Bandari College in Mombasa port, Kenya) was carried out for JRPA staff.

Training fields were i) operation and maintenance of cargo handling equipment, ii) maintenance of port facilities and iii) port statistics, which are particularly important for river port operation and management.

The number of participants were six (6); four (4) for i) and ii), and two (2) for iii). Participants were chief class.

Three Japanese experts were dispatched to Bandari College to facilitate the effective implementation of the training through the following activities.

- 1) Overall coordination/Training program
 - a) Preparatory works for invitation of trainees from JRPA in cooperation with JICA
 - b) Technical transfer activities which are not included in other expert assignments
- 2) Operation and maintenance of cargo handling equipment
 - a) Technical transfer activities based on JRPA Operation Manual
 - b) Technical transfer activities on safe mechanized cargo handling
 - c) Technical transfer activities on maintenance of cargo handling equipment
- 3) Maintenance of port facilities
 - a) Technical transfer activities based on JRPA Operation Manual

- b) On-site facility maintenance
- 4) Port procedures and port statistics (hereinafter referred to as “port statistics”)
 - a) Technical transfer activities based on JRPA Operation Manual
 - b) Technical transfer activities on port procedures
 - c) Technical transfer activities on port statistics

Overall Picture of the Third Country Training

Training will be implemented on only the most important aspects of port management and operation due to limited resources

Objective	i) to maintain know-how and skills acquired during the former Technical Assistance ii) to help facilitate the commencement of the grant aid project and succeeding technical assistance
Priority Field	A. Cargo Handling B. Maintenance for Cargo Handling Equipment & Civil Facilities C. Port Procedures and Statistics
Two (2) Training Course	i) Cargo Operationa, Infrastructure & Equipment Maintenance ii) Basic Port Documentation & Statistics
Personal Target & Follow-up	Setting of a personal target by each trainee in advance Action Plan prepared by each trainee and Proposal for the next technical assistance by the experts

A Training Course for Two (2) Weeks for Four (4) Trainees		A Training Course for One (1) Week for Two (2) Trainees	
i-1) Training on Mechanized Cargo Handling		i-2) Maintenance of Cargo Handling Equipment & Civil Facility	
Subjects	Knowledge on Mechanized Cargo Handling	Maintenance of Cargo Handling Equipment	Port Procedures
	Laws and Regulations related to Cargo Handling	Maintenance & Inspection of Cargo Handling Equipment	Entry/Exit Procedures and Documentation
	Kinds & Characteristics of Cargo Handling Equipment	Repair of Cargo Handling Equipment	Port Statistics
	Electric & Hydraulic Control of Cargo Handling Equipment	Maintenance Management of Civil Facilities (including Attached Facilities)	Laws and Regulations related to Port Statistics
	Safety in Cargo Handling	Maintenance Management of Civil Facility	Items to be collected as Port Statistics
	Method for Cargo Handling	Maintenance & Repair of Civil Facilities and its Practical Exercise	Compilation Method of Port Statistics
Cargo Handling using Crane and its Operational Exercise	Maintenance & Repair of Interlocking and its Practical Exercise	Practical Exercise for Compilation of Data using Computer	
Cargo Handling using Folklift and its Operational Exercise	Maintenance & Repair of Asphalt Pavement and its Practical Exercise		
Dangerous Cargo Handling			
Lectures using JRPA Operation Manual	Lectures using JRPA Operation Manual	Lectures using JRPA Operation Manual	JICA Experts
Lectures on Monitoring Items which are conducted by JRPA			

1.4 Counterpart Agencies

Implementation Agencies: Directorate of River Transport, Ministry of Transport, Roads and Bridges of South Sudan (Responsible person: Director General) and the Ministry of Infrastructure of Central Equatoria State (Responsible person: First Director General)

Counterpart Agency: Juba River Port Administration (JRPA)

1.5 Composition of the Project Team

Name	Assignment	Organization	Pre-Survey	Training
Akira KOYAMA	Leader/Overall Coordinator/ Training Program/Port Statistics (1)	The Overseas Coastal Development Institute of Japan (OCDI)	○	○
Susumu KIMURA	Operation & Maintenance of Mechanized Cargo handling	OCDI	—	○
Eiji HASEBE	Maintenance of Port Facilities/ Port Statistics (2)	OCDI	○	○

2. Contents of the Activities

2.1 Work in Japan (No.1): March 2017

- 1) The Team contacted the Port Manager of JRPA and collect information on the current status of Juba river port. The Team was fortunate that Mr. Zubeir, Port Manager of Juba river port, participated in a JICA training course in Japan, as he was able to provide the Team with timely information. The Team also explained the third country training program and asked him to nominate trainees.
- 2) The Team prepared a work plan containing the basic policy, tentative schedule, project implementation method etc. and submitted it to JICA Headquarters.

2.2 Pre-Survey in Bandari College: 9th April to 16th April, 2017

- 1) Based on the work plan, the Team consulted Bandari College regarding the third country training. The Team explained that two training courses would be conducted; one is a course (A) for cargo operations, infrastructure & equipment maintenance over a period of two weeks, and the other one is a course (B) for basic port documentation & statistics lasting one week. These two courses would start on the same day. Schedule of Course (A) was determined to be from 22nd May to 2nd June while that of Course (B) was set from 22nd May to 26 May respectively.

Regarding training programs, the Team prepared draft programs and discussed arrangements with Bandari College. The Team expressed their expectation that trainees would be chief class and play a role in the training of trainers (TOT) after completion of the training courses; therefore, the Team asked Bandari College to ensure that the contents of the program were suitable for TOT. Furthermore, the Team requested Bandari College to include trainings on site in the program and prepare hand-outs for each lecture.

- 2) Accommodations and transportation from/to airport were determined to be arranged by Bandari College.

2.3 Work in Japan (No.2) : from the middle of April to the middle of May

- 1) The Team prepared a pre-survey report and detail training plan, and submitted it to JICA Headquarters. (The detailed training plan is attached in Appendix.)
- 2) The Team had asked the Port Manager of JRPA in advance to nominate chief class members of JRPA who were highly motivated in order to maximize the training output. As a result, suitable members were nominated.
- 3) The Team asked the nominees to prepare a presentation paper in advance which covered

their personal goal and skills which they hoped to acquire during the training program. All the nominees prepared the presentation paper.

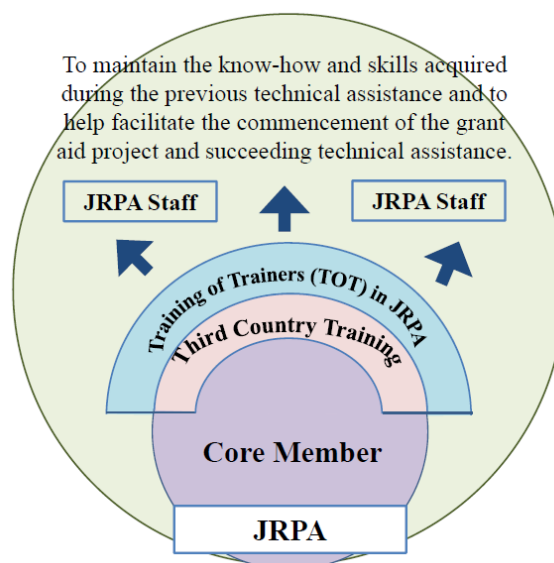
Nominees and their Personal Goal

		What is your purpose for participation on the study tour?	What kind of skills do you want to acquire in the study tour?	How to utilize the skills and know-how acquired in the study tour?
Training Course I	William Wruuda	I want to increase my low carrier to upper carrier as a refreshment course	I want to acquire the new technique, modern machinery which is now computerized.	Improvement of the new skills in the operation management I want to make sure to train the young one.
	Emmanuel Kamal	To increase my carrier to upper carrier as to refreshment course	To acquire the modern technology which is computerized	To improve the system in operation
	Kamal Awad	To acquire more skills in maintenance and operation cargo handling equipment at electrical port	Maintenance of cargo handling equipment and repair of electrical port	This is by implementation of the skills acquired practical at Juba river port
	Joel Pauline	To acquire a skill in port management operation	Maintenance of cargo handling equipment and maintenance of port facility	To utilize the skill, is through implementation of the study tour course at Juba river port Administration (JRPA)
Training Course II	Charles Juma	To acquire a skill on port management operation and cargo handling facilities	A skill on cargo handling of statistics data and warehouse logistics	To utilize the skill, is through implementation of the study tour course at Juba river port
	Charlaine Jansuk	Refreshment of my carrier Upgrading of my carrier Sharing of the knowledge with my advance friends Building of good relationship with my partners	Acquiring the modern skill in the world technology Unique and famous system of operation Collection of real and standard statistical information	Preventing the skills by using it Production of annual report to the institution and the public at large Train the other friends

2.4 Implementation of training in Bandari College : from 20th May to 4th June, 2017

The third country training was implemented in Bandari College, Mombasa port, Kenya. During the training, the Team reported two times on the progress of the training to JICA.

- 1) Upon commencement of the training, the Team explained the details of the training program to trainees and stressed that trainees would be expected to be engaged in Training of Trainers (TOT) after they returned back home.
- 2) The Team conducted two series of lectures respectively. When conducting lectures, the Team reviewed operation and maintenance of cargo handling equipment, maintenance of port facilities and compilation of port statistics by utilizing JRPA Operation Manual. Furthermore, the Team focused on practical skills and know-how which would be useful on site in consultation with Bandari College.
- 3) One trainee complained of his physical condition. Bandari College immediately called an ambulance which took him to a hospital where he recovered soon. Bandari College's prompt response was greatly appreciated.
- 4) The final training programs are shown below.



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Cargo Operations, Infrastructure & Equipment Maintenance

KPA/HR-BC/FM/010A
ISSUE NO: 001
DATE OF ISSUE: 11/11/15
ISSUED BY: DP (ACAD)
AUTHORISED BY: HBC



BANDARI COLLEGE
COURSE TIMETABLE

COURSE TITLE: CARGO OPERATIONS INFRASTRUCTURE & EQUIPMENT MAINTENANCE COURSE.

START DATE: 22.05.2017 END DATE: 02.06.2017

TIME/DATE	0800 – 1000		1030 – 1230		1400 - 1500		1530 -1630
MONDAY 22/05/2017	Registration/ Trainee presentation/Outline Twalib & Z. Otwori	B	Lecture by JICA Expert	L	Cargo handling Operations- Conventional Cargo Lugho	B	Cargo handling Operations- Container Operations. Lugho
TUESDAY 23/05/2017	Equipment Operations in Cargo Handling Mbalanya	R	Equipment Operations in Cargo Handling Mbalanya	U	Equipment Operations in Cargo Handling Mbalanya	R	Equipment Operations in Cargo Handling Mbalanya
WEDNESDAY 24/05/2017	Lecture by JICA	E	Import cargo Documentation Shigali	N	Export Cargo Documentation Shigali	E	Export Cargo Documentation Shigali
THURSDAY 25/05/2017	Stevedoring operations Kenga	A	Stevedoring operations Kenga	C	Bulk Cargo Operations Mwajambia	A	Bulk Cargo Operations Mwajambia
FRIDAY 26/05/2017	Practical- conventional cargo, Terminal Engineering & Container Operations. Lugho & Nyamao	K	Practical- conventional cargo, Terminal Engineering & Container Operations Lugho & Nyamao	H	Practical- conventional cargo, Terminal Engineering & Container Operations Lugho & Nyamao	K	Practical- conventional cargo, Terminal Engineering & Container Operations Lugho & Nyamao

Course Coordinator: M. TwalibSignature Date.....

Training Officer: Zipporah OtworiSignature..... Date. 22/05/2017.....

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BANDARI COLLEGE
COURSE TIMETABLE

COURSE TITLE: CARGO OPERATIONS, INFRASTRUCTURE & EQUIPMENT MAINTENANCE COURSE.

START DATE: 22.05.2017 END DATE: 02.06.2017

TIME/DATE	0800 – 1000		1030 – 1230		1400 - 1500		1530 -1630
MONDAY 29/05/2017	Repair of Cargo Handling Equipment Nyamao	B	Repair of Cargo Handling Equipment Nyamao	L	Replacement of equipment parts Nyamao	B	Replacement of equipment parts Nyamao
TUESDAY 30/05/2017	Lecture by JICA	R	Lecture by JICA	U	Outline- Civil Works/ Maintenance of interlocking block pavement Okwar	R	Maintenance of interlocking block pavement Okwar
WEDNESDAY 31/05/2017	Maintenance of Asphalt concrete pavement Okwar	E	Maintenance of Asphalt concrete pavement Okwar	N	Maintenance of other civil infrastructure Okwar	E	Maintenance of other civil infrastructure Okwar
THURSDAY 01/06/2017	HOLIDAY						
FRIDAY 02/06/2017	Maintenance of other civil infrastructure Okwar	K	Maintenance of other civil infrastructure Okwar	H	Action Plan JICA Expert	K	Course Evaluation/ Closing ceremony R. Watene

Course Coordinator: M. TwalibSignature Date.....

Training Officer: Zipporah OtworiSignature..... Date. 22/05/2017.....

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Basic Port Documentation & Statistics

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AUTHORISED BY: HBC



**BANDARI COLLEGE
COURSE TIMETABLE**

COURSE TITLE: *BASIC PORT DOCUMENTATION & STATISTICS COURSE FOR S/SUDAN.* START DATE: 22.05.2017. END DATE: 26.05.2017

TIME/DATE	0800 – 1000		1030 – 1230		1400 - 1500		1530 -1630
DAY/ DATE	0800-1000	1000- 1030	1030-1200	120- 1400	1400- 1500	1500- 1530	1530 - 1700
MONDAY 22/05/2017	Registration/ Trainee presentation/Outline Twalib & Z. Otwor	B	Port documentation Shigali	L	Inbound Cargo Documentation Shigali	B	Inbound Cargo Documentation Shigali
TUESDAY 23/05/2017	Outbound Cargo Documentation Shigali	R	Outbound Cargo Documentation Shigali	U	Productivity of Cargo Handling Equipment B. Mwajambia	R	Productivity of Cargo Handling Equipment B. Mwajambia
WEDNESDAY 24/05/2017	Collection of Port Statistics E. Kafana	E	Collection of Port E. Kafana	N	Collection of Port Statistics (Office Visit) E. Katana	E	Collection of Port Statistics (Statistics Office Visit) E. Katana
THURSDAY 25/05/2017	Methods of Compiling Port Statistics Golicha	A	Methods of Compiling Port Statistics Golicha	C	Sample statistics of the port Golicha	A	Practical- Sample statistics of the port Golicha
FRIDAY 26/05/2017	Lecture JICA Expert	K	Action Plan JICA Expert	H	Course Evaluation & Closing R.Watene/ ALL	K	END

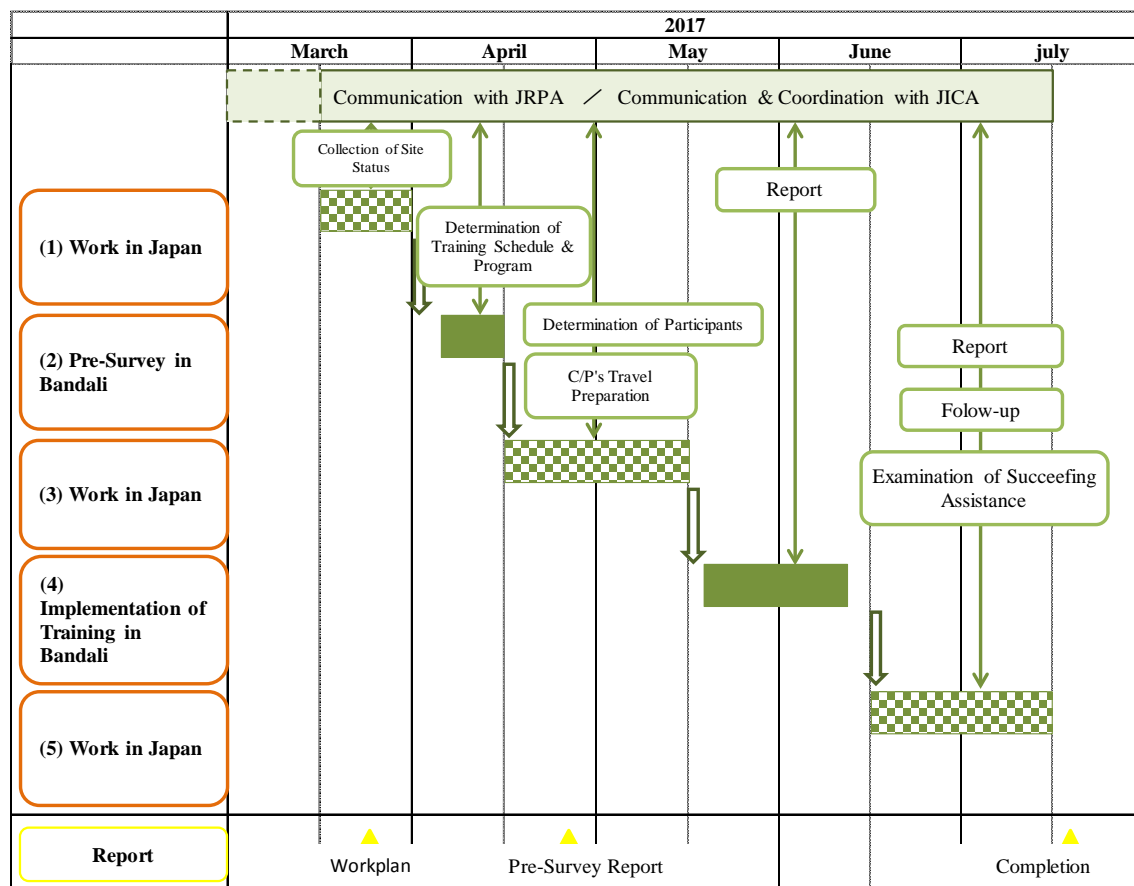
Course Coordinator: *M. Twalib*Signature Date.....

Training Officer: *Zipporah Otwor*Signature.....*Zipporah Otwor*.....Date. *22/05/2017*.....

2.5 Work in Japan (No3): from the latter half of June to the middle of July

- 1) The Team pointed out that group trainings in Japan, third country training, etc. might be possible types of assistance even before peace and order would be restored. On the other hand, the Team stressed importance of implementation of the grant aid project which would depend on peace and order situation.
- 2) The Team submitted a completion report to JICA in which the above ideas for subsequent technical assistance were included.

Implemented Schedule of the Project



: Major Items for Communication/Coordination

3. Challenges and Lessons Learnt

Results of questionnaires and comments by trainees indicated that they were satisfied with the training in Bandari College.

Challenges and lessons learnt through the training courses this time are summarized as follows.

Exchanging views with JRPA staff using e-mail is not easy. The Team was very lucky because Mr. Zubeir, Port Manager of JRPA participated in a JICA group training course; therefore the Team was able to inform him of details of a third country training plan and sufficiently exchange views in advance. This allowed the Team to conduct thorough preparations which contributed to the successful implementation of the training.

The Team has maintained good relations and communications with Bandari College as both parties had a similar experience on October 2014. As the purpose of the training and a draft training program prepared by the Team were sent to Bandari College long before the scheduled training, the representatives of Bandari College had sufficient time to become well acquainted with the purposes and contents of the training course. This is also thought to be a reason that the training program produced good results.

Furthermore, trainees understood well the meanings and purposes of the training this time through the Port Manager beforehand in the preparation stage though the Team explained the same at the beginning of the training course. Trainees also understood that they would be expected to take part in Training of Trainers (TOT) upon completion of the course. The trainees prepared their personal goals and action plans as requested. However, it is difficult for the Team to follow-up on their action plans; therefore the Team would like to ask JICA, specifically JICA South Sudan Office to follow-up their action plans.

In particular, the follow-up items are as follows;

- ① To share the knowledge and materials obtained from the training with other JRPA staff,
- ② To obtain and collect the cargo data from barge companies by JRPA statistics staff, etc.

Experts of the Team accompanied trainees during most lectures and on-site trainings. This also contributed to a successful outcomes because experts of the Team were able to grasp the intention/needs of trainees and communicate them to lecturers. At the request of the Team, lecturers sometimes gave lectures/instructions on site rather than in a classroom environment as originally planned.

Members of the Team had the following roles. One expert of the Team accompanied each course and served as an interface between trainees and lecturers. Meanwhile, the third expert's role was to communicate and coordinate with executives and training officers of Bandari College. Based on this role demarcation, the Team was able to realize smooth implementation of the training.

It was confirmed anew that careful preparations and sufficient communication led to positive outcomes.

However, there were challenges. One of the limitations of group training was that it was difficult to prepare a specific training course for a trainee who had a specific specialty.

Operations of Bandari College seemed to considerably improve comparing to the previous training conducted on October 2014. This might be because the Team requested Bandari College to prepare lecture materials in advance; in addition training officers functioned well as coordinators. However, Information on how to conduct lectures was not always shared among lecturers. In future, if this type of training is conducted again at Bandari College, further close communications will be needed and requests from the JICA Experts should be explained repeatedly.

Appendix

1. Material List used in the Training

Bandari College

- 「Key Performance Indicators (KPIs), Presentation on Statistics」
- 「Productivity of Cargo Handling Equipment」
- 「Export Documentation」
- 「Import Documentation」
- 「Statistics Section (KPA)」
- 「Study on Development of Port Statistics and Performance Indicators in PMAESA Ports」
- 「Cargo-Handling Equipment on Board and in Port」
- 「Repairs in Maintenance」
- 「An Introduction to Cranes」
- 「Equipment Safety Checklist」
- 「How to Maintain a Forklift」
- 「Forklifts」
- 「Port Equipment」
- 「Infrastructure Maintenance, Concrete Material」

JICA Experts

- 「Training in Bandari」
- 「Monitoring after Leaving of the Project Team」
- 「Regulation on the Use of the Public Property」
- 「Regulation on Cargo Handling Service Provider」
- 「General Rules for the Use of the Jetty Area (Draft for Consultation)」
- 「Port Statistics (Overview of the Statistics)」
- 「Cargo Handling Operation Manual in Juba River Port (Mechanized Cargo Handling)」
- 「Manual for Safe Cargo Handling Operations」
- 「Manual for Port Statistics」
- 「Port Facility Maintenance」
- 「Harmonized System」

2. Pictures of Training



Orientation



Lecture by Bandari College Lecturer



Lecture by JICA Expert



Lecture by JICA Expert



Lecture by JICA Expert



Lecture by Bandari College Lecturer

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Field Training



Field Training



Field Training



Field Training



Completion Certificate



Closing Ceremony

3. Other Activities

1) Actual Dispatch

Assignmet	Name	Organization	2017					
			March	April	May	June	July	
Leader/Overall Coordinator/ Training Program/Port Statistics(1)	Akira KOYAMA	OCDI		■		■		
Operation & Maintenance of Mechanized Cargo Handling	Susumu KIMURA	OCDI				■		
Maintenance of Port Facilities/ Port Statistics(2)	Eiji HASEBE	OCDI		■		■		
Third Country Training				■ Pre-Survey		■ Implementation		
Report				▲ Workplan	▲ Pre-Survey Report			▲ Completion Report

2) Detailed Training Plan

Detailed Training Plan at Bandari College, Mombasa

1. Training Course:

- i) Training for Mechanized Cargo Handling, Maintenance of Cargo Handling Equipment and Civil Works
- ii) Training for Port Procedures and Statistics

2. Venue of Training

Bandari College, Mombasa, KENYA

3. Training Schedule

- i) For Training i): from Monday, 22nd May, 2017 to Friday, 2nd June, 2017 (one day before and after for traveling from/to Juba, South Sudan)
- ii) For Training ii): from Monday, 22nd May, 2017 to 26th June, 2017 (one day before and after for traveling from/to Juba, South Sudan)

4. Participants

For Training i)

Willian Wruda

Kamal Emmanuel

Kamal Award

Joel Pauline

For Training ii)

Charles Jume

Chaplain Jansuk

5. Training Program

- i) Training for Mechanized Cargo Handling, Maintenance of Cargo Handling Equipment and Civil Works

6. Accommodation and Meals

Provided by Bandari College (Dormitory and Canteen in Bandari College)

7. Transportation from/to Airport

Provided by Bandari College

8. Allowance

Provided by the JICA Project Team based on JICA's rule

9. JICA Project Team

KOYAMA, KIMURA and HASEBE of OCDI and the JICA Project Team will fully attend the training and will give some lectures themselves.

10. Air Ticket

Provided by JICA South Sudan Office

11. VISA

Each trainee shall obtain a visa to enter Kenya by himself. Detailed information on obtaining a VISA will be provided by JICA South Sudan Office.

12. Yellow Card

Each trainee is required to obtain a yellow fever vaccination certificate prior to entering Kenya.

3) Action Plan

William Wruda

Action Plan

(Name) Willian Wruda

(Title of Training Course) Mechanized Cargo Handling, Maintenance of Infrastructure and Equipment

1. Your Goal

- i) Learning the new technology and operation of computerized cargo handling equipment
- ii) Making operation training of cargo handling equipment to the young staff of the operation department of JRPA
- iii) Acquiring the capability to perform operation of the new cargo handling equipment without accident

2. What you learnt in this training Course

- i) How to operate Fork Lift and Harbor Crane
- ii) Cargo handling operations and container operations
- iii) Civil works maintenance of interlocking block pavement
- iv) Repair of cargo handling equipment
- v) Export and import documentations

3. Actions to be taken after going back to JRPA

- i) My Action is to train JRPA staff in the operation department of JRPA
- ii) I will teach them on cargo operation using materials which I obtained in this training course.
- iii) I will train them on how to handle cargo safely.

4. Required outputs

- i) We need;
 - Fork Lift 25 ton
 - Crawler Crane 120ton
 - Belt Conveyer
- ii) I need more training; therefore I ask JICA and OCDI to continue to train us.
- iii) I hope Juba River Port Extension Project by JICA will start soon. We need new facilities and equipment.

Emmanuel Kamal

Action Plan

(Name) Emmuel Kamal

(Title of Training Course) Cargo Operations, Infrastructure & Equipment Maintenance

1. Your Goal

- i) Learning the new technology and operation of computerized cargo handling equipment
- ii) Making operation training of cargo handling equipment to the young staff of the operation department of JRPA
- iii) Acquiring the capability to perform operation of the new cargo handling equipment without accident

2. What you learnt in this training Course

- i) Cargo handling operation of conventional cargo
- ii) Equipment operation in cargo handling
- iii) Practical operation of conventional cargo terminal equipment
- iv) Export and import documentations

3. Actions to be taken after going back to JRPA

- i) My Action Plan is to implement the skills obtained on the study tour course in JRPA
- ii) To provide good services to JRPA operation department such as safe cargo handling and efficient cargo handling
- iii) To train young JRPA staff. There are six or seven staff in the operation department of JRPA

4. Required outputs

- i) We need;
 - Fork Lift 25 ton
 - Crawler Crane
 - Reach Stacker
 - Mobile Crane 35ton
- ii) I need more training; therefore I ask JICA and OCDI to continue to train us.
- iii) We want more support from Japanese Government and JICA. Juba river port needs more facilities and equipment.

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Kamal Awad

Action Plan

(Name) Kamal Awad Frajalla

(Title of Training Course) Cargo Operations, Infrastructure & Equipment Maintenance

1. Your Goal

- i) To achieve knowledge, competences and experiences in cargo handling operations.
- ii) To acquire skill, knowledge about maintenance of operation equipment.
- iii) Learning the new technology about port facilities.

2. What you learnt in this training Course

- i) Have acquired knowledge about types of cargoes
 - Containerizing - Conventional cargo - Bulk Cargoes (Liquid – Dry)
- ii) Have acquired knowledge about types of operation equipment
 - Mobile Crane - Crawler Crane - Huber Crane - Forklift
- iii) Have acquired knowledge how to maintain and repair cargo handling equipment.
- iv) Have acquired knowledge in documentation of export, import cargo and stevedoring operation.
- v) Have acquired idea about civil works, asphalt and civil infrastructure.
 - Interlocking block pavement
 - Asphalt concrete pavement

3. Actions to be taken after going back to JRPA

- i) I will be able to train technicians of JRPA about the knowledge acquired during the training course.
- ii) Training of trainers (TOT) from another port in south Sudan about cargo handling operation equipment.
- iii) Awareness about the importance of safety for staff of JRPA in general and maintenance section in particular.
- iv) I will be able to supervise about civil works and civil infrastructure in JRPA.

4. Required outputs

- i) To JICA ,OCDI more training for JRPA staff to improve capacity building and skills
- ii) To JICA ,OCDI specialized training for maintenance section of JRPA preferably practically
- iii) Implementation of JRPA construction project is needed.
- iv) Link of relationship needed between JICA,OCDI, KPA and JRPA for consultation

Joel Pauline

Action Plan

(Name) Joel Pauline

(Title of Training Course) Cargo Operations, Infrastructure & Equipment Maintenance

1. Your Goal

- i) My goal is to change the current condition of maintenance and repair of port facilities in JRPA
- ii) To present good service to the port users in maintenance of computerized machines and other equipment
- iii) To acquire the capability to maintain the new cargo handling without breakdown, and train the other new staff in JRPA

2. What you learnt in this training Course

- i) How to manage and how to maintain port equipment (Fork-Lift, Mobile Crane, Crawler Crane, Reach stacker, Harbor Crane, Hopper and Grab
- ii) Maintenance of Asphalt concrete pavement and repair of crocodile cracks, Interlocking block pavement and Civil Engineering work
- iii) Export documentation and import documentation. Export documentation means shipping the goods and service out of the country and Import documentation means shipping the goods and service in the country.
- iv) Repair of cargo handling equipment and Replacement of equipment parts

3. Actions to be taken after going back to JRPA

- i) To utilize the skills by implementation of the study tour course of Juba River Port Administration
- ii) Initially I start by organizing the two important sections of Maintenance department and Operation department in JRPA, these two departments need complete materials every one need (warehouse, workshop and all type of tools...so on)
- iii) Secondly I will make same training to my staff: who did not attend in this training in Bandari college

4. Required outputs

- i) Crawler crane, mobile crane, 120t-----35t
- ii) Fork-lift, truck with crane 15t/25t-----20t
- iii) Belt conveyer ,hopper, grab 10m-----
- iv) Reach stacker and one gantry crane 40t
- v) Two small cars for JRPA staff: for the services
- vi) Capacity building of JRPA needs more training in all sections: I request to JICA/OCDI to organize training in maintenance and Operation before end of the Project, because OCIDI/JICA will provide as with cargo handling equipment and this port equipment need good management For this reason I request to ocdi to arrange for as training title mechanized cargo handling and Maintenance of cargo handling equipment, civil engineering work in JAPAN duration of two Months, before end of the Project.

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Charles Juma

Action Plan

(Name) Charles Peter

(Title of Training Course) Basic Port Documentation and Statistics

1. Your Goal

To achieve statistics data collection and information which is to be analyzed, compiled and presented

2. What you learnt in this training Course

A lot as for statistics data information, book documentation, port procedures, etc.

3. Actions to be taken after going back to JRPA

Action is to implement what has been achieved physical or practical
Establishment of collecting data and information is very important. I will invite people from barge companies periodically and ask them to submit data. JRPA will compile such data as port statistics
I will also

4. Required outputs

Required outputs are the goal in every business of whatever we do, but with the use of port facilities or equipment to achieve the outputs as targeted ends.
We need more training; therefore we request JICA to prepare more training course in Japan and/or other countries. I will appeal my idea to my boss.

Other comments

1. Training of Juba river port administration staff to a level as the one of port Mombasa and like any other ports in the world through JICA technical cooperation project and enhancement of operation management capacity of inland waterway in the Republic of South Sudan will be still necessary.
2. The construction of Juba river port which is an expansion project of Juba river port through JICA grant aid is very essential.
3. The Port is supposed to be like any sustainable organization just like airport or civil aviation which develops by revenue collection that it collects. In the near future, Juba river port depends on revenue collection for it is progress of development, not to depend on the third party from outside resources for it is development.
4. Tariff system; There must be law that governs the procedures.
5. Collection of data information is very essential because for future use. Of course, we analyze statistics and compile and present

Chaplain Jansuk

Action Plan

(Name) Chaplain Jansuk Augustino

(Title of Training Course) Basic Port Documentation and Statistics

1. Your Goal

- i) Setting f new system of statistics development in Juba River Port
- ii) Addition of new staffs in statistics department
- iii) Setting up in new facilities to enable the work of statistics more smooth (e.g. computer, printer and furniture)
- iv) TO make the use of statistic useful

2. What you learnt in this training Course

- i) Method of compiling and documentation of port statistics
- ii) How to generate and be more productive in my home port
- iii) How to control statistics to be in right information for wise decision making
- iv) How to differential the types of cargo, transshipment, transit and cargo handling

3. Actions to be taken after going back to JRPA

- i) Quick improvement of statistics data and information in a right channel
- ii) Compiling of statistics information for further decision in a new future
- iii) I am going to organize and train our more staffs to join the statistics and know the importance of statistics
- iv) To improve the new system of data entry and reporting duration to the management oboard

4. Required outputs

- i) From the point of view, Juba River Port in the near future is going to be one of the standard port which is going to have good modern system of revenue collection.
- ii) All the staffs of Juba River Port has acquired basic knowledge of managing the port function.
- iii) Juba River Port is going to acquire its financial budget independently.
- iv) Also, once more through with the help of JICA and OCDF with the training that supported us, it makes Juba River Port strong. We still need more support from you for better knowledge
- v) We need your support to install the statistic development in Juba River Port Administration (JRPA).

The Project on Monitoring Support and Improvement of the Operation and management of Juba River Port in the Republic of South Sudan Completion Report

4) Questionnaire

William Wruda

~ Questionnaire ~

◆ Purpose of Questionnaire:
Questionnaire is used for the evaluation and monitoring of the program. Please give us your constructive opinions to improve our program.

◆ Date of Submission:
Please follow the instructions of the JICA Officer and Training Coordinator.

◆ Basic Information:
Please fill out the following.

Course Name	The Project on Monitoring Support and Improvement for the Operation and Management of Juba River Port	
Name of Participant	Mr. M ^r . WILLIAM WRUDA ABUJO	
Country	The Republic of South Sudan	
Sex	<input checked="" type="checkbox"/> Male	<input type="checkbox"/> Female
Age	43 YEARS	
Course Duration	14 WEEKS	

PART I Program output

Course Objective
The purpose of this project is to ensure that the know-how and skills acquired during the previous technical assistance are maintained and to help facilitate the commencement of the grant aid project and succeeding technical assistance.

Q1. Have you achieved Course Objective?
 Fully Achieved 十分達成できた 達成していない Not achieved
 4 3 2 1

Q2. Any comments or suggestions, especially if your rating is 1 or 2.
 NO

Q3. Please describe the subjects of the Course from the following viewpoints, and give the reason.

(1) Subjects that were especially useful	- cargo handling	<Reason>
(2) Subjects that were not necessary	-	<Reason>
(3) Subjects that were not covered, but should have been included	-	<Reason>

1/4

Q8. Do you think the knowledge and experience you acquired through the course is useful?

A Yes, it can be directly applied to work.

B It cannot be directly applied, but it can be adaptable to work.

C It cannot be directly applied or adapted, but it can be of reference to me.

D No, it was not useful at all.

Q9. Did you get appropriate facilitation (e.g. an advice for better understanding of the lectures, advice for making an action plan, etc.) by Japanese side in order for you to achieve your objective?
 Yes, very much 満足した 満足していない No, not at all
 4 3 2 1

Q10. Concerning the accommodations, please mark your level of satisfaction.
(※If you didn't stay at JICA Center or Hotels, please mark X.)

	← Satisfied 満足した 満足していない Unsatisfied →				X
■ Facilities at Bandari College	<input checked="" type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/>
■ Meals at Bandari College	<input checked="" type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/>
■ Service at Bandari College	<input checked="" type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/>

Q11. Any comments or suggestions for improvement concerning Q1~Q10 above, especially if your ratings are negative. Please also write the question number corresponding to each of your comment (See an example). NO

example:
 Q6---We had many important lectures. But in the most of lectures we didn't have enough time to ask questions. I think we need more discussions for deepening our understanding. I also wanted to have opportunities to exchange opinions with other participants to polish my idea of action plan.

PART III Findings and Learnings

1-4. (Essential): "Your findings on useful Knowledge"

Q1. Of the knowledge you acquired through the program, please choose the useful knowledge (method, service, organization, system, institution, concept), techniques and skills which can be adaptable or adaptable to solve problems in your country.

Q4. Please describe the subjects of the Course from the following viewpoints, and give the reason.

(1) Subjects that were especially useful	- conventional cargo handling equipment operation in cargo handling	<Reason>
(2) Subjects that were not necessary	NO	<Reason>
(3) Subjects that were not covered, but should have been included	NO	<Reason>

PART II Program Design

Q1. Do you find the design of the course appropriate for you (your organization) to achieve the Course Objective?
 (※design of course: structure of modules in the course)
 Yes, appropriate 適切である 適切ではない No, inappropriate
 4 3 2 1

Q2. Do you find the period of the course appropriate?
 Long 長い Appropriate 適切 Short 短い

Q3. Do you find the number of participants in the course appropriate?
 Too many 多い Appropriate 適切 Too few 少ない

Q4. Did you have enough opportunities to get direct experiences such as site-visits and practices in the course?
 Yes, enough 十分あった なかった No, very few
 4 3 2 1

Q5. Did you have enough opportunities to participate actively in the course, such as discussions and workshops?
 Yes, enough 十分あった なかった No, very few
 4 3 2 1

Q6. Was the quality of lectures good enough for you to understand clearly?
 Yes, very good 良かった 不十分だった No, poor
 4 3 2 1

Q7. Were you satisfied with the textbooks and materials used in the course?
 Yes, very much 満足した 満足していない No, not at all
 4 3 2 1

Q2. Please describe why the knowledge you chose is useful.
 - It is useful for better productivity of conventional operation.

Q3. Please describe how to adopt or adapt it (them) into your organization or your country. Also, if there are any obstacles when adopting or adapting it, please describe.
 - The adoption is through practical operation of conventional cargo and container handling system.

※あなたの回答はJICAが事業改善のために使用させていただきます。ご協力ありがとうございます。
 ※Your comments may be quoted and used by JICA for improving our program. Thank you very much for your cooperation.

- Please it is of very grateful for your support project to handling our situation in Juba River port, please keep supporting.

2/4

4/4

The Project on Monitoring Support and Improvement of the Operation and management of Juba River Port in the Republic of South Sudan Completion Report

Emmanuel Kamal

~ Questionnaire ~

◆ Purpose of Questionnaire:
Questionnaire is used for the evaluation and monitoring of the program. Please give us your constructive opinions to improve our program.

◆ Date of Submission:
Please follow the instructions of the JICA Officer and Training Coordinator.

◆ Basic Information:

Please fill out the following.

Course Name	The Project on Monitoring Support and Improvement for the Operation and Management of Juba River Port
Name of Participant	Mr./Ms. <u>EMMANUEL KAMAL LALA</u>
Country	The Republic of South Sudan
Sex	<input checked="" type="checkbox"/> Male <input type="checkbox"/> Female
Age	<u>46 YEARS.</u>
Course Duration	<u>TWO WEEK</u>

PART I Program output

Course Objective

The purpose of this project is to ensure that the know-how and skills acquired during the previous technical assistance are maintained and to help facilitate the commencement of the grant aid project and succeeding technical assistance.

Q1. Have you achieved Course Objective?

← Fully Achieved 十分達成できた 4 3 2 1 Not achieved →

Q2. Any comments or suggestions, especially if your rating is 1 or 2.

Q3. Please describe the subjects of the Course from the following viewpoints, and give the reason.

(1) Subjects that were especially useful	<i>Equipment operation & cargo</i>	<i>Reason: To handle conventional cargo and Container cargo safely.</i>
(2) Subjects that were not necessary		
(3) Subjects that were not covered, but should have been included		

1/4

Q8. Do you think the knowledge and experience you acquired through the course is useful?

<input checked="" type="checkbox"/> A	Yes, it can be directly applied to work.
<input type="checkbox"/> B	It cannot be directly applied, but it can be adaptable to work.
<input type="checkbox"/> C	It cannot be directly applied or adapted, but it can be of reference to me.
<input type="checkbox"/> D	No, it was not useful at all.

Q9. Did you get appropriate facilitation (e.g. an advice for better understanding of the lectures, advice for making an action plan, etc.) by Japanese side in order for you to achieve your objective?

← Yes, very much 満足した 4 3 2 1 No, not at all →

Q10. Concerning the accommodations, please mark your level of satisfaction.

(※If you didn't stay at JICA Center or Hotels, please mark X.)

	← Satisfied 満足した <input checked="" type="checkbox"/> 4 <input type="checkbox"/> 3 <input type="checkbox"/> 2 <input type="checkbox"/> 1 Unsatisfied →	X
■ Facilities at Bandari College	<input checked="" type="checkbox"/> 4 <input type="checkbox"/> 3 <input type="checkbox"/> 2 <input type="checkbox"/> 1	<input type="checkbox"/>
■ Meals at Bandari College	<input checked="" type="checkbox"/> 4 <input type="checkbox"/> 3 <input type="checkbox"/> 2 <input type="checkbox"/> 1	<input type="checkbox"/>
■ Service at Bandari College	<input checked="" type="checkbox"/> 4 <input type="checkbox"/> 3 <input type="checkbox"/> 2 <input type="checkbox"/> 1	<input type="checkbox"/>

Q11. Any comments or suggestions for improvement concerning Q1~Q10 above, especially if your ratings are negative. Please also write the question number corresponding to each of your comment (See an example).

example:
Q9—We had many important lectures. But in the most of lectures we didn't have enough time to ask questions. I think we need more discussions for deepening our understanding. I also wanted to have opportunities to exchange opinions with other participants to polish my idea of action plan.

PART III Findings and Learnings

1-4.(Essential): "Your findings on useful Knowledge"

The best of Knowledge I do acquire is going to be useful in my port.

Q1. Of the knowledge you acquired through the program, please choose the useful knowledge (method, service, organization, system, institution, concept), techniques and skills which can be adoptable or adaptable to solve problems in your country.

3/4

Q4. Please describe the subjects of the Course from the following viewpoints, and give the reason.

(1) Subjects that were especially useful	<i>Equipment operation</i>	<i>Reason: for Safety cargo handling.</i>
(2) Subjects that were not necessary		
(3) Subjects that were not covered, but should have been included		

PART II Program Design

Q1. Do you find the design of the course appropriate for you (your organization) to achieve the Course Objective?

(※design of course: structure of modules in the course)
← Yes, appropriate 適切である 4 3 2 1 No, inappropriate →

Q2. Do you find the period of the course appropriate?

← Long 長い 4 3 2 1 Short 短い

Q3. Do you find the number of participants in the course appropriate?

← Too many 多い 4 3 2 1 Too few 少ない

Q4. Did you have enough opportunities to get direct experiences such as site-visits and practices in the course?

← Yes, enough 十分あった 4 3 2 1 No, very few →

Q5. Did you have enough opportunities to participate actively in the course, such as discussions and workshops?

← Yes, enough 十分あった 4 3 2 1 No, very few →

Q6. Was the quality of lectures good enough for you to understand clearly?

← Yes, very good 良かった 4 3 2 1 No, poor →

Q7. Were you satisfied with the textbooks and materials used in the course?

← Yes, very much 満足した 4 3 2 1 No, not at all →

2/4

Q2. Please describe why the knowledge you chose is useful.

It is for the better cargo handling in Juba River Port in a near future.

Q3. Please describe how to adopt or adapt it (them) into your organization or your country. Also, if there are any obstacles when adopting or adapting it, please describe.

Through direct implementation of cargo handling equipment.

※あなたの回答はJICAが事業改善のために使用させていただきます。ご協力ありがとうございます。
※Your comments may be quoted and used by JICA for improving our program. Thank you very much for your cooperation.

*It is very successful to achieve this training in bandari, for the better use in Juba Port
Thanks for Jica and OCTSI for their great support for us, Keep support Juba River Port Administration*

The Project on Monitoring Support and Improvement of the Operation and management of Juba River Port in the Republic of South Sudan Completion Report

Kamal Awad

~ Questionnaire ~

◆ **Purpose of Questionnaire:**
Questionnaire is used for the evaluation and monitoring of the program. Please give us your constructive opinions to improve our program.

◆ **Date of Submission:**
Please follow the instructions of the JICA Officer and Training Coordinator.

◆ **Basic Information:**

Please fill out the following.

Course Name	The Project on Monitoring Support and Improvement for the Operation and Management of Juba River Port
Name of Participant	Mr./Ms. <i>Kamal Awad Frajalla Yugu</i>
Country	The Republic of South Sudan
Sex	<input checked="" type="checkbox"/> Male <input type="checkbox"/> Female
Age	<i>37 Year</i>
Course Duration	<i>22-05-2017 ~ 02-06-2017</i>

PART I Program output

Course Objective

The purpose of this project is to ensure that the know-how and skills acquired during the previous technical assistance are maintained and to help facilitate the commencement of the grant aid project and succeeding technical assistance.

Q1. Have you achieved Course Objective?

Fully Achieved 十分達成できた	達成していない Not achieved
<input checked="" type="checkbox"/> 4	<input type="checkbox"/> 3 <input type="checkbox"/> 2 <input type="checkbox"/> 1

Q2. Any comments or suggestions, especially if your rating is 1 or 2.

Q3. Please describe the subjects of the Course from the following viewpoints, and give the reason.

(1) Subjects that were especially useful	<i>maintenace of cargo handling equipment</i>	<i>Because it is a part of my section</i>
(2) Subjects that were not necessary		
(3) Subjects that were not covered, but should have been included		

1/4

Q8. Do you think the knowledge and experience you acquired through the course is useful?

<input checked="" type="checkbox"/> A	Yes, it can be directly applied to work.
<input type="checkbox"/> B	It cannot be directly applied, but it can be adaptable to work.
<input type="checkbox"/> C	It cannot be directly applied or adapted, but it can be of reference to me.
<input type="checkbox"/> D	No, it was not useful at all.

Q9. Did you get appropriate facilitation (e.g. an advice for better understanding of the lectures, advice for making an action plan, etc.) by Japanese side in order for you to achieve your objective?

Yes, very much 満足した	満足していない No, not at all
<input checked="" type="checkbox"/> 4	<input type="checkbox"/> 3 <input type="checkbox"/> 2 <input type="checkbox"/> 1

Q10. Concerning the accommodations, please mark your level of satisfaction.

(※If you didn't stay at JICA Center or Hotels, please mark X.)

	満足した Satisfied	満足していない Unsatisfied		X
Facilities at Bandari College	<input checked="" type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
Meals at Bandari College	<input checked="" type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
Service at Bandari College	<input checked="" type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1

Q11. Any comments or suggestions for improvement concerning Q1~Q10 above, especially if your ratings are negative. Please also write the question number corresponding to each of your comment (See an example).

example:
Q9—We had many important lectures. But in the most of lectures we didn't have enough time to ask questions. I think we need more discussions for deepening our understanding. I also wanted to have opportunities to exchange opinions with other participants to polish my idea of action plan.

PART II Findings and Learnings

1-4.(Essential): "Your findings on useful Knowledge"

Q1. Of the knowledge you acquired through the program, please choose the useful knowledge (method, service, organization, system, institution, concept), techniques and skills which can be adoptable or adaptable to solve problems in your country.

3/4

Q4. Please describe the subjects of the Course from the following viewpoints, and give the reason.

(1) Subjects that were especially useful	<i>EXPORT and import documentation Charges</i>	<i>Necessary in (JRPA) To Avoid documentation by private Companies.</i>
(2) Subjects that were not necessary		
(3) Subjects that were not covered, but should have been included		

PART III Program Design

Q1. Do you find the design of the course appropriate for you (your organization) to achieve the Course Objective?

(※Design of course: structure of modules in the course)

Yes, appropriate 適切である	適切ではない No, inappropriate
<input checked="" type="checkbox"/> 4	<input type="checkbox"/> 3 <input type="checkbox"/> 2 <input type="checkbox"/> 1

Q2. Do you find the period of the course appropriate?

Long 長い	Appropriate 適切	Short 短い
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Q3. Do you find the number of participants in the course appropriate?

Too many 多い	Appropriate 適切	Too few 少ない
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Q4. Did you have enough opportunities to get direct experiences such as site-visits and practices in the course?

Yes, enough 十分あった	なかった No, very few
<input checked="" type="checkbox"/> 4	<input type="checkbox"/> 3 <input type="checkbox"/> 2 <input type="checkbox"/> 1

Q5. Did you have enough opportunities to participate actively in the course, such as discussions and workshops?

Yes, enough 十分あった	なかった No, very few
<input checked="" type="checkbox"/> 4	<input type="checkbox"/> 3 <input type="checkbox"/> 2 <input type="checkbox"/> 1

Q6. Was the quality of lectures good enough for you to understand clearly?

Yes, very good 良かった	不十分だった No, poor
<input checked="" type="checkbox"/> 4	<input type="checkbox"/> 3 <input type="checkbox"/> 2 <input type="checkbox"/> 1

Q7. Were you satisfied with the textbooks and materials used in the course?

Yes, very much 満足した	満足していない No, not at all
<input checked="" type="checkbox"/> 4	<input type="checkbox"/> 3 <input type="checkbox"/> 2 <input type="checkbox"/> 1

1- cargo handling operations (conventional cargo)
2- equipment operation in cargo handling
Q2. Please describe why the knowledge you chose is useful.
<i>To avoid the cargos is handling manually in (JRPA)</i>
Q3. Please describe how to adopt or adapt it (them) into your organization or your country. Also, if there are any obstacles when adopting or adapting it, please describe.
<i>currently (TOT) Training of Trainer About the Knowledge I have acquired during the course period.</i>

※あなたの回答はJICAが事業改善のために使用させていただきます。ご協力ありがとうございます。
※Your comments may be quoted and used by JICA for improving our program. Thank you very much for your cooperation.

Thanks for JICA and OCGI for been supporting (JRPA) your cooperation cooperation is high appreciate appreciated. and we are looking forward for more cooperation to improvement of (JRPA)

4/4

The Project on Monitoring Support and Improvement of the Operation and management of Juba River Port in the Republic of South Sudan Completion Report

Joel Pauline

~ Questionnaire ~

◆ Purpose of Questionnaire:
Questionnaire is used for the evaluation and monitoring of the program. Please give us your constructive opinions to improve our program.

◆ Date of Submission:
Please follow the instructions of the JICA Officer and Training Coordinator.

◆ Basic Information:
Please fill out the following.

Course Name	The Project on Monitoring Support and Improvement for the Operation and Management of Juba River Port
Name of Participant	Mr/Ms. JOEL PAULINO LADO
Country	The Republic of South Sudan
Sex	<input checked="" type="checkbox"/> Male <input type="checkbox"/> Female
Age	34 Years
Course Duration	22-05-2017 ~ 02-05-2017

PART I Program output

Course Objective
The purpose of this project is to ensure that the know-how and skills acquired during the previous technical assistance are maintained and to help facilitate the commencement of the grant aid project and succeeding technical assistance.

Q1. Have you achieved Course Objective?
 Fully Achieved 十分達成できた 達成していない Not achieved →
 4 3 2 1

Q2. Any comments or suggestions, especially if your rating is 1 or 2. **NO comments**

Q3. Please describe the subjects of the Course from the following viewpoints, and give the reason.

(1) Subjects that were especially useful	Port equipment
<Reason>	Because of the equipment working in a good condition = output
(2) Subjects that were not necessary	All are necessary for all experience.
<Reason>	
(3) Subjects that were not covered, but should have been included	NO,
<Reason>	

Q8. Do you think the knowledge and experience you acquired through the course is useful?

A Yes, it can be directly applied to work.

B It cannot be directly applied, but it can be adaptable to work.

C It cannot be directly applied or adapted, but it can be of reference to me.

D No, it was not useful at all.

Q9. Did you get appropriate facilitation (e.g. an advice for better understanding of the lectures, advice for making an action plan, etc.) by Japanese side in order for you to achieve your objective?
 Yes, very much 満足した 満足していない No, not at all →
 4 3 2 1

Q10. Concerning the accommodations, please mark your level of satisfaction.
 (※If you didn't stay at JICA Center or Hotels, please mark X.)

	満足した	満足していない	Unsatified	X
Facilities at Bandari College	<input checked="" type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
Meals at Bandari College	<input checked="" type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
Service at Bandari College	<input checked="" type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1

Q11. Any comments or suggestions for improvement concerning Q1~Q10 above, especially if your ratings are negative. Please also write the question number corresponding to each of your comment (See an example).

example:
 Q6-----We had many important lectures. But in the most of lectures we didn't have enough time to ask questions. I think we need more discussions for deepening our understanding. I also wanted to have opportunities to exchange opinions with other participants to polish my idea of action plan.

PART III Findings and Learnings

1-4.(Essential): "Your findings on useful Knowledge"

Q1. Of the knowledge you acquired through the program, please choose the useful knowledge (method, service, organization, system, institution, concept), techniques and skills which can be adoptable or adaptable to solve problems in your country.

Q4. Please describe the subjects of the Course from the following viewpoints, and give the reason.

(1) Subjects that were especially useful	Maintenance of port facilities
<Reason>	To give a good output.
(2) Subjects that were not necessary	Maintenance of the equipment
<Reason>	Because good maintenance results a good output.
(3) Subjects that were not covered, but should have been included	Safety and ware house logistics.
<Reason>	

PART II Program Design

Q1. Do you find the design of the course appropriate for you (your organization) to achieve the Course Objective?
 (※design of course: structure of modules in the course)
 Yes, appropriate 適切である 適切ではない No, inappropriate →
 4 3 2 1

Q2. Do you find the period of the course appropriate?
 Long 長い Appropriate 適切 Short 短い

Q3. Do you find the number of participants in the course appropriate?
 Too many 多い Appropriate 適切 Too few 少ない

Q4. Did you have enough opportunities to get direct experiences such as site-visits and practices in the course?
 Yes, enough 十分あった なかった No, very few →
 4 3 1

Q5. Did you have enough opportunities to participate actively in the course, such as discussions and workshops?
 Yes, enough 十分あった なかった No, very few →
 4 3 1

Q6. Was the quality of lectures good enough for you to understand clearly?
 Yes, very good 良かった 不十分だった No, poor →
 4 3 2 1

Q7. Were you satisfied with the textbooks and materials used in the course?
 Yes, very much 満足した 満足していない No, not at all →
 4 3 2 1

Q2. Please describe the knowledge you chose is useful.
Repair of cargo Handling Equipment and maintenance of Port Facilities.
Maintenance of port facilities.

Q3. Please describe how to adopt or adapt it (them) into your organization or your country. Also, if there are any obstacles when adopting or adapting it, please describe.
Adopting through by practicing.

※あなたの回答はJICAが事業改善のために使用させていただきます。ご協力ありがとうございます。
 ※Your comments may be quoted and used by JICA for improving our program. Thank you very much for your cooperation.

The Project on Monitoring Support and Improvement of the Operation and management of Juba River Port in the Republic of South Sudan Completion Report

Charles Juma

~ Questionnaire ~

◆ Purpose of Questionnaire:
Questionnaire is used for the evaluation and monitoring of the program. Please give us your constructive opinions to improve our program.

◆ Date of Submission:
Please follow the instructions of the JICA Officer and Training Coordinator.

◆ Basic Information:

Please fill out the following.

Course Name	The Project on Monitoring Support and Improvement for the Operation and Management of Juba River Port
Name of Participant	Mr./Ms. <i>Charles Peter Nyambi Sejis</i>
Country	The Republic of South Sudan
Sex	<input checked="" type="checkbox"/> Male <input type="checkbox"/> Female
Age	<i>48</i>
Course Duration	<i>7 days</i>

Reason. Safety information is very essential for every worker at the port or at work place.

Q4. Please describe the subjects of the Course from the following viewpoints, and give the reason.

(1) Subjects that were especially useful	<i>port documentation</i> Because it contains vast port unit of section, carrying work at the port.
(2) Subjects that were not necessary	<i>private entity.</i> It has nothing to do with port activities because it is out side the port modern.
(3) Subjects that were not covered, but should have been included	<i>Safety information</i> It aware every one about the danger of accident, so safety is first.

PART I Program output

Course Objective
The purpose of this project is to ensure that the know-how and skills acquired during the previous technical assistance are maintained and to help facilitate the commencement of the grant aid project and succeeding technical assistance.

Q1. Have you achieved Course Objective?
 Fully Achieved 十分達成できた 達成していない Not achieved

Q2. Any comments or suggestions, especially if your rating is 1 or 2.
NO. Suggestion.

Q3. Please describe the subjects of the Course from the following viewpoints, and give the reason.

(1) Subjects that were especially useful	<i>Statistic information data.</i>
(2) Subjects that were not necessary	<i>Private entity.</i> it has got different system than that of port activities.
(3) Subjects that were not covered, but should have been included	<i>ware house logistics and safety information system.</i>

Q8. Do you think the knowledge and experience you acquired through the course is useful?

A Yes, it can be directly applied to work.

B It cannot be directly applied, but it can be adaptable to work.

C It cannot be directly applied or adapted, but it can be of reference to me.

D No, it was not useful at all.

Q9. Did you get appropriate facilitation (e.g. an advice for better understanding of the lectures, advice for making an action plan, etc.) by Japanese side in order for you to achieve your objective?
 Yes, very much 満足した 満足していない No, not at all

Q10. Concerning the accommodations, please mark your level of satisfaction.
 (※If you didn't stay at JICA Center or Hotels, please mark X.)

	Satisfied 満足した	満足していない Unsatisfied	X
Facilities at Bandari College	<input checked="" type="checkbox"/> 4 <input type="checkbox"/> 3 <input type="checkbox"/> 2 <input type="checkbox"/> 1		<input type="checkbox"/>
Meals at Bandari College	<input checked="" type="checkbox"/> 4 <input type="checkbox"/> 3 <input type="checkbox"/> 2 <input type="checkbox"/> 1		<input type="checkbox"/>
Service at Bandari College	<input checked="" type="checkbox"/> 4 <input type="checkbox"/> 3 <input type="checkbox"/> 2 <input type="checkbox"/> 1		<input type="checkbox"/>

Q11. Any comments or suggestions for improvement concerning Q1~Q10 above, especially if your ratings are negative. Please also write the question number corresponding to each of your comment (See an example). *Q3. ad Q9.*

example:
 Q9—We had many important lectures. But in the most of lectures we didn't have enough time to ask questions. I think we need more discussions for deepening our understanding. I also wanted to have opportunities to exchange opinions with other participants to polish my idea of action plan.

PART II Findings and Learnings

1-4. (Essential): "Your findings on useful Knowledge"

Q1. Of the knowledge you acquired through the program, please choose the useful knowledge (method, service, organization, system, institution, concept), techniques and skills which can be adoptable or adaptable to solve problems in your country.

PART II Program Design

Q1. Do you find the design of the course appropriate for you (your organization) to achieve the Course Objective?
 (※design of course: structure of modules in the course)
 Yes, appropriate 適切である 適切ではない No, inappropriate

Q2. Do you find the period of the course appropriate?
 Long 長い Appropriate 適切 Short 短い

Q3. Do you find the number of participants in the course appropriate?
 Too many 多い Appropriate 適切 Too few 少ない

Q4. Did you have enough opportunities to get direct experiences such as site-visits and practices in the course?
 Yes, enough 十分あった なかった No, very few

Q5. Did you have enough opportunities to participate actively in the course, such as discussions and workshops?
 Yes, enough 十分あった なかった No, very few

Q6. Was the quality of lectures good enough for you to understand clearly?
 Yes, very good 良かった 不十分だった No, poor

Q7. Were you satisfied with the textbooks and materials used in the course?
 Yes, very much 満足した 満足していない No, not at all

port documentation because it facilitate easy running of operation of the port.

Q2. Please describe why the knowledge you chose is useful.
As mentioned above, port documentation can be at a base or reference for any previous dates.

Q3. Please describe how to adopt or adapt it (them) into your organization or your country. Also, if there are any obstacles when adopting or adapting it, please describe.
Adopting is tough by practising, because practicing makes better or improves more.

※あなたの回答はJICAが事業改善のために使用させていただきます。ご協力ありがとうございます。
 ※Your comments may be quoted and used by JICA for improving our program. Thank you very much for your cooperation.

The Project on Monitoring Support and Improvement of the Operation and management of Juba River Port in the Republic of South Sudan Completion Report

Chaplain Jansuk

~ Questionnaire ~

◆ Purpose of Questionnaire:
Questionnaire is used for the evaluation and monitoring of the program. Please give us your constructive opinions to improve our program.

◆ Date of Submission:
Please follow the instructions of the JICA Officer and Training Coordinator.

◆ Basic Information:

Please fill out the following.

Course Name	The Project on Monitoring Support and Improvement for the Operation and Management of Juba River Port
Name of Participant	Mr./Ms. <u>CHAPLAIN JANSUK AUGUSTINE LOWANI</u>
Country	The Republic of South Sudan
Sex	<input checked="" type="checkbox"/> Male <input type="checkbox"/> Female
Age	<u>38 YEARS</u>
Course Duration	<u>ONE WEEK</u>

PART I Program output

Course Objective

The purpose of this project is to ensure that the know-how and skills acquired during the previous technical assistance are maintained and to help facilitate the commencement of the grant aid project and succeeding technical assistance.

Q1. Have you achieved Course Objective?

Fully Achieved 十分達成できた 達成していない Not achieved --
 4 3 2 1

Q2. Any comments or suggestions, especially if your rating is 1 or 2.

This time the course is very interesting especially in my department of Statistics. Things are all well.

Q3. Please describe the subjects of the Course from the following viewpoints, and give the reason.

(1) Subjects that were especially useful	Port documentation Productivity Port statistics Reason: For easy analysis of export and import cargoes. An overall measures how specific resources are managed to timely objectives.
(2) Subjects that were not necessary	Reason:
(3) Subjects that were not covered, but should have been included	Reason:

1/4

Q8. Do you think the knowledge and experience you acquired through the course is useful?

A Yes, it can be directly applied to work.
 B It cannot be directly applied, but it can be adaptable to work.
 C It cannot be directly applied or adapted, but it can be of reference to me.
 D No, it was not useful at all.

Q9. Did you get appropriate facilitation (e.g. an advice for better understanding of the lectures, advice for making an action plan, etc.) by Japanese side in order for you to achieve your objective?

Yes, very much 満足した 満足していない No, not at all --
 4 3 2 1

Q10. Concerning the accommodations, please mark your level of satisfaction.

(※ If you didn't stay at JICA Center or Hotels, please mark X.)

	Satisfied/満足した					Not satisfied/満足していない					X
	4	3	2	1	0	4	3	2	1	0	
Facilities at Bandari College	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Meals at Bandari College	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Service at Bandari College	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q11. Any comments or suggestions for improvement concerning Q1~Q10 above, especially if your ratings are negative. Please also write the question number corresponding to each of your comment (See an example).

example:

Q8-----We had many important lectures. But in the most of lectures we didn't have enough time to ask questions. I think we need more discussions for deepening our understanding. I also wanted to have opportunities to exchange opinions with other participants to polish my idea of action plan.

There are more to be added, but the period of course is very limited, not enough.

PART III Findings and learnings

1-4. (Essential): "Your findings on useful Knowledge"

Q1. Of the knowledge you acquired through the program, please choose the useful knowledge (method, service, organization, system, institution, concept), techniques and skills which can be adoptable or adaptable to solve problems in your country.

Q4. Please describe the subjects of the Course from the following viewpoints, and give the reason.

(1) Subjects that were especially useful	Collection of port statistics Compiling port statistics Plan of actions Reason: To reach the decision making, to gather all information in one form/files to organize before for a better future.
(2) Subjects that were not necessary	Reason:
(3) Subjects that were not covered, but should have been included	Reason:

PART II Program Design

Q1. Do you find the design of the course appropriate for you (your organization) to achieve the Course Objective?

(※ design of course: structure of modules in the course)

Yes, appropriate 適切である 適切ではない No, inappropriate --
 4 3 2 1

Q2. Do you find the period of the course appropriate?

Long 長い Appropriate 適切 Short 短い

Q3. Do you find the number of participants in the course appropriate?

Too many 多い Appropriate 適切 Too few 少ない

Q4. Did you have enough opportunities to get direct experiences such as site-visits and practices in the course?

Yes, enough 十分あった なかった No, very few --
 4 3 2 1

Q5. Did you have enough opportunities to participate actively in the course, such as discussions and workshops?

Yes, enough 十分あった なかった No, very few --
 4 3 2 1

Q6. Was the quality of lectures good enough for you to understand clearly?

Yes, very good 良かった 不十分だった No, poor --
 4 3 2 1

Q7. Were you satisfied with the textbooks and materials used in the course?

Yes, very much 満足した 満足していない No, not at all --
 4 3 2 1

Port documentation
 Collection of Port Statistics
 Compiling port statistics method
 Reason: For easy analysis of export and import cargoes. An overall measures how specific resources are managed to timely objectives.

Q2. Please describe why the knowledge you chose is useful.

To improve the efficiency and effectiveness of Juba River Port to high quality productivity in a near future.

Q3. Please describe how to adopt or adapt it (them) into your organization or your country. Also, if there are any obstacles when adopting or adapting it, please describe.

It is very clear that the department of statistics has acquired the right channel of performing and indicators of statistics in the Port.

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 ※Your comments may be quoted and used by JICA for improving our program. Thank you very much for your cooperation.

The course is useful and effective to the base of our understanding.
 All the lectures are soft and clear.
 Only the duration of the courses is very short.
 The lectures were busy, the time is limited.
 All the teachers are pouring out every thing which is useful.

4/4

Materials used by Lecturers (Added Edition)

Training Materials

The Project on Monitoring Support and Improvement of Operation
and Management of River Port in the Republic of South Sudan
Completion Report (Training Materials)

Bandari College

- B1. 「Key Performance Indicators (KPIs), Presentation on Statistics」
- B2. 「Productivity of Cargo Handling Equipment」
- B3. 「Export Documentation」
- B4. 「Import Documentation」
- B5. 「Statistics Section (KPA)」
- B6. 「Study on Development of Port Statistics and Performance Indicators in PMAESA Ports」
- B7. 「Cargo-Handling Equipment on Board and in Port」
- B8. 「Repairs in Maintenance」
- B9. 「An Introduction to Cranes」
- B10. 「Equipment Safety Checklist」
- B11. 「How to Maintain a Forklift」
- B12. 「Forklifts」
- B13. 「Port Equipment」
- B14. 「Infrastructure Maintenance, Concrete Material」

JICA Experts

- J1. 「Training in Bandari」
- J2. 「Monitoring after Leaving of the Project Team」
- J3. 「Regulation on the Use of the Public Property」
- J4. 「Regulation on Cargo Handling Service Provider」
- J5. 「General Rules for the Use of the Jetty Area (Draft for Consultation)」
- J6. 「Port Statistics (Overview of the Statistics)」
- J7. 「Cargo Handling Operation Manual in Juba River Port (Mechanized Cargo Handling)」
- J8. 「Manual for Safe Cargo Handling Operations」
- J9. 「Manual for Port Statistics」
- J10. 「Port Facility Maintenance」
- J11. 「Harmonized System」

KEY PERFORMANCE INDICATORS (KPIs)

PRESENTATION ON STATISTICS

25TH MAY 2017

Growing Business, Enriching Lives



TYPES OF PERFORMANCE MEASURES

- 1. Output/Production measures:** An indicator that capture total tonnage, port throughput, berth throughput, number of ship call, receipts and delivery at the gate.
- 2. Productivity measures:** An indicator that measure port productivity per hour/day.
- 3. Utilization measures:** An indicator that measure the intensity of facility utilization.
- 4. Service measures:** Efficiency indicator on service delivery



PRODUCTION MEASURES

- **TRAFFIC MEASURES**
(quantity per unit time)

- containers/time
- TEUs/time
- tonnage/time
- cargo value/time
- revenue/time

Secondary measures —

- container status
- origin or destination
- commodity class

- **THROUGHPUT MEASURES**
(movements per unit time)

- ship throughput
- quay transfer throughput
- container yard throughput
- receipt/delivery throughput

total equivalent terminal throughput



TERMINAL TRAFFIC EXAMPLE

VESSEL	Discharged		Loaded		Transshipped	
	20'	40'	20'	40'	20'	40'
Alpha	146	41	161	56	40	11
Beta	208	72	197	37	57	21
Gamma	127	90	212	111	33	17
Delta	241	63	301	59	61	25
Epsilon	308	81	362	107	97	34
Zeta	170	53	192	105	87	17
TOTALS	1200		1425		375	3000
		400		475		125
		1600		1900		500
						4000

Traffic = 4000 Containers
 = 3000 X 20' + 1000 X 40'
 = 5000 TEUs



SHIP THROUGHPUT

ACTIVITY		MOVES
'Local' containers discharged	— 1600	1600
'Local' containers loaded	— 1900	1900
Transshipment containers discharged	— 500	500
Transshipment containers loaded	— 600	600
Containers shifted via quay	— 125	250
Containers shifted in vessel	— 40	40
Containers restowed via quay	— 50	100
Containers restowed in vessel	— 40	40
Hatch covers lifted and replaced	— 70	140
TOTAL EQUIVALENT CONTAINER MOVES		5170

TRAFFIC
'ADDITIONAL'
MOVEMENTS

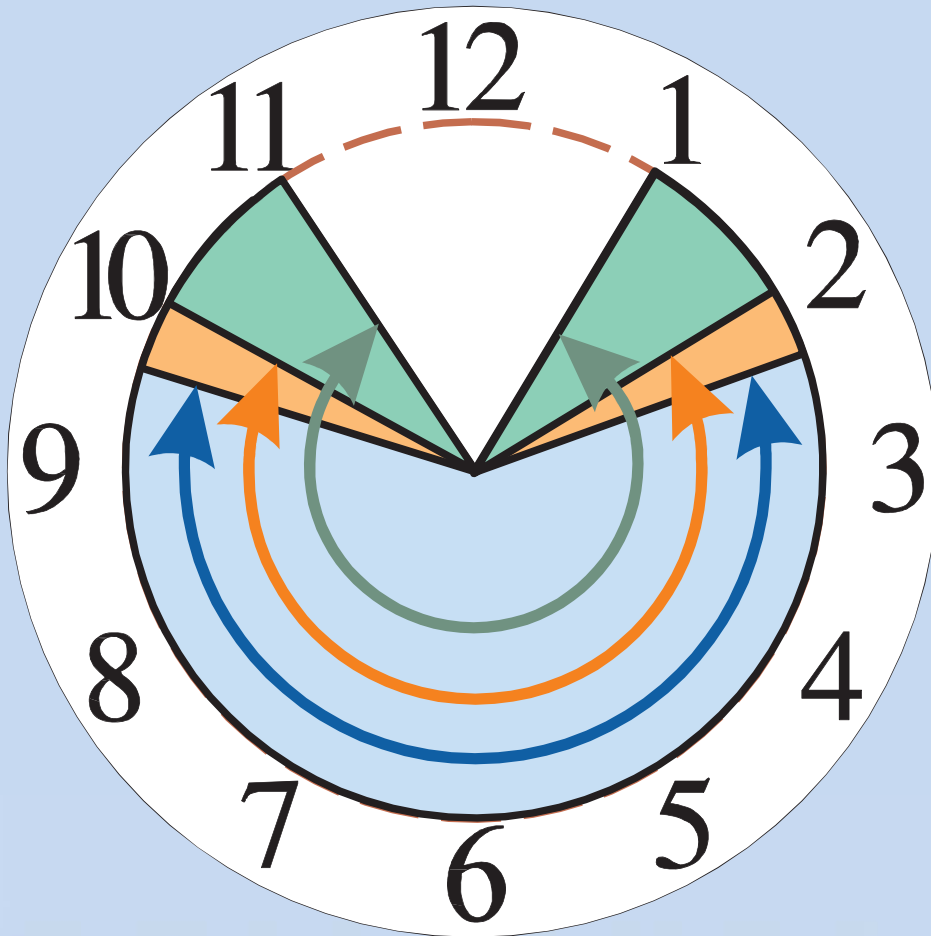


PRODUCTIVITY INDICATOR

- Ship productivity
- Crane
- Quay productivity
- Terminal area productivity
- Storage area productivity
- CFS area productivity
- Equipment productivity
- Labour productivity
- Cost-effectiveness



SHIP PRODUCTIVITY MEASURES



- Container moves/ship-hour in port
- Container moves/ship-hour at berth
- Container moves/ship-working hour

SHIP PRODUCTIVITY MEASURES

EVENT	TIME			
Ship arrives in port	05.30			
Ship berths	08.15			
Work starts	09.15	} 12.5 hrs	} 14 hrs	} 18 hrs
Work finishes	21.45			
Ship leaves berth	22.15			
Ship leaves port	23.30			



SHIP PRODUCTIVITY EXAMPLE

$$\frac{638 \text{ moves}}{\text{ship's time in port}} = \frac{638}{18.0} = 35.4 \text{ moves/ship-hour in port}$$

$$\frac{638 \text{ moves}}{\text{ship's time at berth}} = \frac{638}{14.0} = 45.6 \text{ moves/ship-hour at berth}$$

$$\frac{638 \text{ moves}}{\text{ship working hours}} = \frac{638}{12.5} = 51.0 \text{ moves/gross ship working hour}$$

NET WORKING TIME

$$\begin{aligned} &= \text{Gross working time} - (\text{non-operational time} + \text{idle time}) \\ &= 12.5 - ([2 \times 0.5] + [0.5 + 0.25]) \text{ hrs} \\ &= 12.5 - 1.75 \text{ hrs} = 10.75 \text{ hrs} \end{aligned}$$

PRODUCTIVITY

$$\frac{638}{10.75} = 59.3 \text{ moves/net ship working hour}$$



GROSS CRANE PRODUCTIVITY

Gross Berth Working Time = 12.5 hours
No. of cranes at work = 3
∴ Gross Crane Working Time = 37.5 hours
Equivalent container moves = 638

∴ Gross crane productivity = $\frac{638 \text{ moves}}{37.5 \text{ hours}}$
= 17.0 moves/crane/gross working hour



NET CRANE PRODUCTIVITY

$$\begin{aligned}\text{Non-operational time} &= 2 \times 0.5\text{hr mealbreaks/crane} \\ &= 3\text{hrs}\end{aligned}$$

$$\begin{aligned}\text{Idle times} &= 0.25\text{hr/crane} + 0.5\text{hr delay} \\ &= 1.25\text{hrs}\end{aligned}$$

$$\therefore \text{Non-working time} = 4.25\text{hrs}$$

$$\therefore \text{Net working time} = 37.5 - 4.25\text{hrs} = 33.25\text{hrs}$$

$$\begin{aligned}\therefore \text{Net crane productivity} &= \frac{638 \text{ moves}}{33.25 \text{ hours}} \\ &= 19.2 \text{ moves /crane / net working hour}\end{aligned}$$



LABOUR PRODUCTIVITY

TRAFFIC = 4000 CONTAINERS

WORKFORCE	LABOUR-HOURS	PRODUCTIVITY
All employees (300)	$300 \times 8 \times 5$ = 12,000 staff-hours	$4000 \div 12,000$ = 0.33 container/staff-hour
Operational employees (180)	$180 \times 8 \times 5$ = 7,200 staff-hours	$4000 \div 7200$ = 0.55 container/staff-hour
One operation (75)	75×8 = 600 staff-hours	$520 \div 600$ = 0.87 container/staff-hour $615 \div 600$ = 1.0 TEU/staff-hour $675 \div 600$ = 1.1 moves/staff-hour



UTILIZATION INDICATOR

- Quay utilization
- Storage utilization
- CFS storage utilization
- Gate utilization
- Equipment utilization
- Berth Occupancy

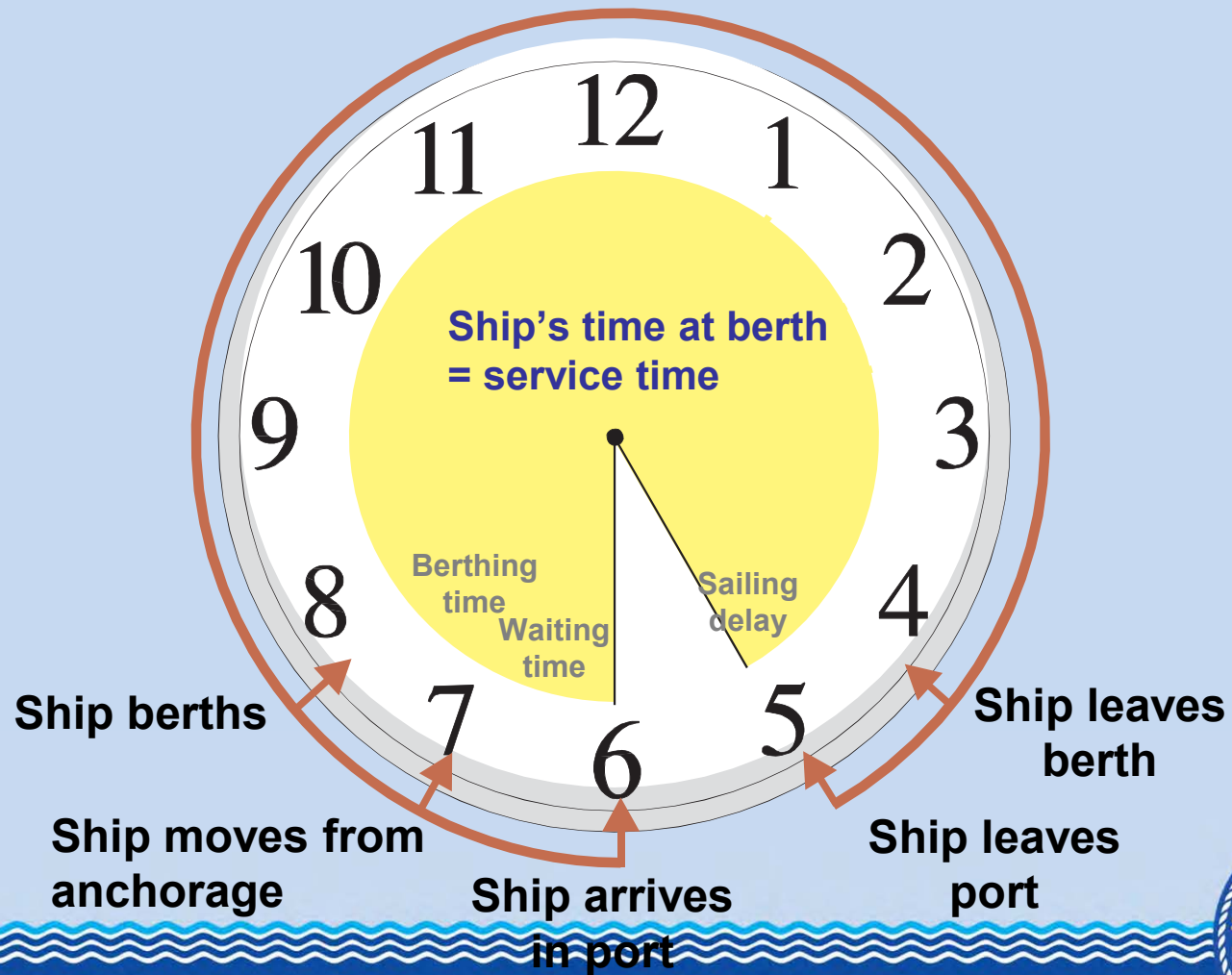


SERVICE MEASURES

- Ship turnaround time
- Cargo dwell time
- Road vehicle turnaround time
- Rail service measures
- Equipment downtime
- Equipment availability & reliability



SHIP TURNAROUND TIME



SHIP TURNROUND TIME EXAMPLE

Waiting time 1.0hr (06.00 - 07.00)	} 1.75 hours
Berthing time 0.75hr (07.00 - 07.45)	
Service time (07.45 - 16.15)	8.5 hours
Sailing delay (16.15 - 17.00)	0.75 hours
SHIP TURNROUND TIME	11.0 hours



THANK YOU

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PRODUCTIVITY OF CARGO HANDLING EQUIPMENT

B. A. Mwajambia

OVERVIEW

- Ships and Ports compete
 - Innovations and technological changes.
- If a port fails to follow the changes in shipping, in time it will fall behind the competition.
- The changes in ports are mainly in connection with **port cargo handling techniques** and construction of dedicated terminals.
- Cargo Handling Equipment vital in operations.
- The main objective of the port is to ensure **good** and **effective services** to its **customers** at **minimum cost**.
- Good services are offered by the equipment, facilities and the management.
- Huge investment needs ROI.
- ROI = Financial thru repeat customers and new customers = reputation in terms of performance (productivity & Customer satisfaction)

Productivity

- If you cant measure it, you cant manage it (Peter Drucker)
- You can't improve what you can't measure
- How to measure performance:
 - Efficiency – doing things in a right way
 - Effectiveness – doing the right things
 - **Productivity – combination of efficiency and effectiveness**
measure of outputs divided by inputs

The Relationship Between Efficiency, Effectiveness And Productivity

- **Efficiency**

Determined by the amount of resources that are necessary to obtain certain results.

To meet daily production quota, a specific machine that uses up energy is committed to an operation.

If we are able to meet our daily production with less energy and fewer operators, we have operated more efficiently.

- **Effectiveness**

Determined by comparing what a process can produce with what they actually produce

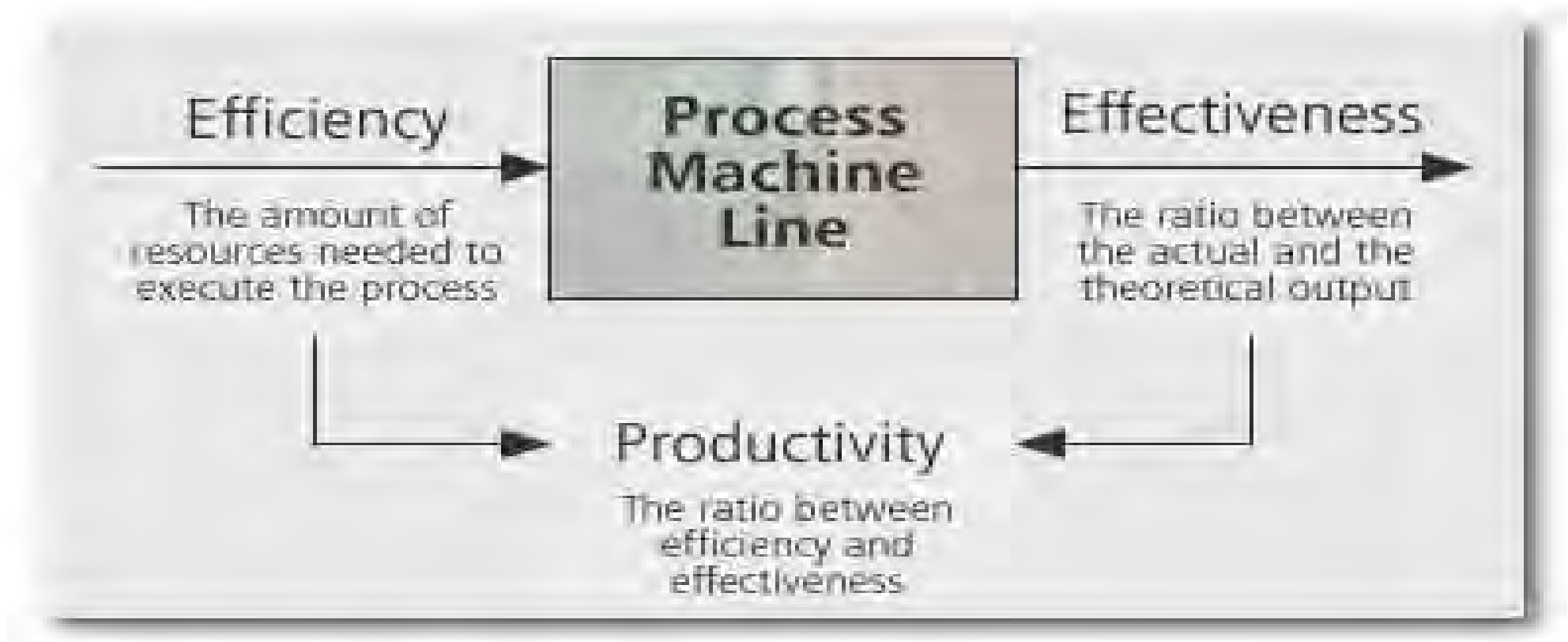
It does not tell anything about the efficiency – the amount of resources that have to be committed to obtain that output

- **Productivity**

Determined by looking at the production obtained (effectiveness) versus the invested effort in order to achieve the result (efficiency)

- If we can achieve more with less effort, productivity increases.

The Relationship Between Efficiency, Effectiveness And Productivity



PRODUCTIVITY

- An overall measure of the ability to produce a good or service.
- Productivity measures **how specified resources are managed to accomplish timely objectives** stated in terms of **quantity** and **quality**.
- Productivity may also be defined as an **index that measures output** (goods and services) **relative to the input** (labour, materials, energy, etc., used to produce the output).
- Equipment performance and productivity are closely related.
 - Performance = the total optimization of all elements related to the equipment to get the desired productivity.
- Productivity of equipment is mainly based on performance of [maintenance](#) and operation.

Equipment maintenance

- A World Bank technical report stated that, on average, equipment maintenance costs range from 15–25 per cent of the total operating costs in a port.
- Maintenance of equipment is the most important aspect of equipment productivity.
- Equipment deteriorates and fails to attain its economical life because of poor maintenance.
- Technological growth of equipment handling systems has led to procurement of sophisticated equipment by ports to improve their productivity.
- This equipment needs proper maintenance and management.

Factors directly affecting maintenance and operation

- Poor equipment inventory and too much old equipment
- No standard system of maintenance
- Non-availability of spare parts
- Poor supervision and control of maintenance work
- Poor leadership
- Lack of control and supervision of operators
- Bad driving practices
- Lack of skilled manpower
- Poor incentives and motivation schemes
- Shortage of technicians and operators
- Poor working environment
- Employee participation

Categories of Maintenance

- There are three broad categories of maintenance:
 - i. Preventive maintenance,
 - ii. Corrective maintenance
- Running maintenance.

Preventive Maintenance

- Preventive maintenance is mainly **based on routine inspection of equipment at scheduled time** in order to avoid major breakdown of the equipment.
- This maintenance for all types of equipment is **done according to a monthly schedule** prepared by the engineer in-charge at the end of every month.
- All **equipment is grouped by type and model** in order to list out maintenance tasks to prepare weekly, monthly, quarterly, half-yearly and yearly schedules according to the manufacturers recommendations.
- These **schedules are printed in ready-made forms** for instant use.
- Technicians assigned for doing maintenance work are instructed by the supervisor giving instructions in a repair book where name, type of maintenance (weekly or monthly, for example), and time of starting work are noted.
- The **repair book is used as a document instead of a job card** for giving instructions to the technicians and keeping records of all types of repairs.

Example of Preventive Maintenance Schedule

TASKS	SCHEDULE A WEEKLY	SCHEDULE B MONTHLY	SCHEDULE C QUATERLY	SCHEDULE D HALF- YEARLY	SCHEDULE E YEARLY
Washing & Cleaning	P	P	P	P	P
Air filter element	C	C	R	R	R
Air compressor	--	--	CL	CL	CL
Lift chain and Chain wheel	A	A & L	A & L	A & L	A & L
Tyres and Rims	W	W	W	W	W & I

Source: Shahjahan A. S. M. (2000)

Corrective Maintenance

- Corrective maintenance involves:
 - breakdown repairs resulting from irregular component failures
 - damages due to accidents, caused by defective components and human errors.
- Done in the same way as preventive maintenance:
 - Instructions are written in different column of the repair book.
- No printed schedule is prepared.
 - The repair book acts as a job card to the technicians.

Running Maintenance

- This maintenance is often performed during operation.
- Mobile workshops and small forklifts are used by the technicians to attend to the running problems of equipment in different locations.

Productivity

- Productivity = output/input
 - Partial Productivity** (measures of output against a specific input) Partial Productivity e.g. items made/employee
 - concerned with efficiency of one particular characteristic
 - Multifactor Productivity** (ratio of output to a group of inputs such as labour and material)
 - an index of output obtained from more than one of the resources used in production/service.
 - Total Productivity** (includes all inputs in an organization i.e. labour, materials, overheads, capital)
 - broadest measure of productivity & is concerned with the performance of entire organization.
 - Total Productivity = Revenues, Profits/All inputs

Cargo Handling Equipment Productivity

- Partial Productivity
 - Machine Units of output per machine hour, Output per unit machine
- Why Cargo Handling Equipment Productivity?
 - How much does it cost to handle each tonne of cargo?
 - Are set targets being achieved?
 - Are customers being satisfied by the services being offered?
 - Are we being effective in our services?
 - Are we being efficient in our services

Cargo Handling Equipment Productivity Measures

- Machine / Equipment productivity:
 - Usually the tonnage / moves made per equipment or group of equipment per working hour
 - Calculated per machine and can be expressed in gross and net values.
 - Crane Productivity
 - Reachstacker
 - Forklift
 - Terminal tractor
 - Bulk loader / unloader
 - etc

Equipment Downtime

- The total time in hours when each or type of equipment is not available for operation due to breakdown repairs, preventive maintenance, waiting for spares and other reasons.
- It is calculated for a given period by using the formula:
$$\text{Downtime} = (\text{Downtime in hrs.} / \text{possible machine hrs.}) * 100$$

where possible machine hours are the number of hours that berths in the port are scheduled to work in that period.

Equipment Availability

- This is a measure of the proportion of the time that each or type of equipment is accessible for berth operations.
- It can be calculated for a given period by using the formula:
 - Availability = (available machine hours / possible hours) * 100

where available machine hours are calculated by subtracting downtime from possible machine hours.

Equipment Utilization

- This is a measure of proportion of the time that a machine is actually engaged in work.
- It is calculated by using the formula:

$$\text{Utilization} = \frac{(\text{Recorded machine hours}) * 100}{\text{possible machine hours}}$$

where the recorded machine hours are the **number of hours actually worked by the machine in a given period.**

Type of equipment	Capacity (ton)	Numbers	Down time		Availability		Utilization	
			hrs.	%	hrs.	%	hrs.	%
Mobile crane	20-30	5	31500	75	10500	25	8400	20
Mobile crane	6-10	17	52836	37	89964	63	57120	40
Forklift truck	5	20	33600	20	134400	80	80640	48
Forklift truck	3	46	200928	52	185472	48	123648	32
Forklift truck	2.5	16	30912	23	103488	77	64512	48
Tractor	20-25	13	61152	56	48048	44	38220	35
Trailer	6-25	39	117936	36	209664	64	127764	39
Shore crane	2-3	25	54600	26	155400	74	94500	45

Source: Shaikhwan A. S. M. (2000)

Demand Availability

- This is a measure of the time that equipment is available when requisitioned by the operation department.
- It can be calculated for a given period using the formula:

$$\text{Demand availability} = \frac{(\text{No. of machines supplied}) * 100}{\text{No. of machines demanded}}$$

Mean Time Between Failure (MTBF)

- This denotes reliability of the equipment and is expressed as duration of time the equipment is utilized before failure occurs.

$$\text{MTBF} = \frac{\text{Worked hours}}{\text{Frequency of failures.}}$$

Mean Time To Repair (MTTR)

- This measures the average duration of time the equipment is laid up for repair
- It can also denote the maintainability of the equipment.

$$\text{MTTR} = \frac{\text{Breakdown time}}{\text{Frequency of failures.}}$$

Factors Influencing Choice of Cargo Handling Equipment

- Different types of equipment is used for handling different cargo.
- Choice of type of equipment / equipment system will depend on:
 - The nature of the cargo,
 - Type of packing / packaging
 - Handling costs,
 - Resources available including land, labour and equipment,
 - Weather conditions,
 - Competitive situation compared with other ports,
 - Types of vessels,
 - Distribution arrangements,
 - Tidal conditions,
 - Inter-modal transport facilities etc.

END

EXPORT DOCUMENTATION

INTRODUCTION

WHAT IS A DOCUMENT.

Is a written or printed paper furnishing information or evidence .

Any written item as a book article or letter, especially of a factual or informative nature.

A computer data file.

Export documentation refers to documents or systems used to transact business in Export processes.

DEFINE EXPORT

Term Export means Shipping the goods and services out of the Port of a country. The seller of such goods is referred to as an Exporter and is based in the country of Export whereas the overseas buyer is referred to as an Importer.

Export is a product that is sold to another country.

It can be agricultural, oil , services etc.

The business or process of selling goods to other countries

To send a product to another country so that it can be sold there.

A country can also export information technology eg CATOS system exported to Kenya by South Korea.

The economic growth of any country depends on the volumes of its Exports and Imports. But its economy will grow faster if the country Exports more than it can import.

YEAR UNDER REVIEW

Statistics available from the year 2013 show that Kenya is placed number 102 in the World leading Exporters having exported goods worth a total of \$6,580,000,000.

China leads with \$17,779,000,000.

European Union \$ 2,252,000,00.

United States \$ 2,173,000,000.

Germany \$1,610,000,00.

Japan \$ 1,547,000,000.

MCT & MCC												
MONTHS	IMPORTS (DISCHARGE)						EXPORTS (LOADED)					
	FULL		TEU'S	EMPTYES		TEU'S	FULL		TEU'S	EMPTYES		TEU'S
	20'	40'		20'	40'		20'	40'		20'	40'	
Jan-15	18847	1129 1	41429	17	183	383	3840	2411	8662	1298 8	9491	3197 0
Feb-15	17084	1193 1	40946	4	332	668	5429	2876	11181	1125 0	7974	2719 8
Mar-15	16608	1116 2	38932	167	241	649	5208	2596	10400	1265 6	8163	2898 2
Apr-15	19534	1176 2	43058	144	247	638	5093	2960	11013	1413 9	9634	3340 7
May-15	17876	1345 1	44778	38	159	356	4898	2264	9426	1326 3	9515	3229 3
Jun-15	19445	1383 0	47105	3	445	893	4919	2677	10273	1172 0	1006 3	3184 6
Jul-15	18457	1293 2	44321	0	123	246	5278	3222	11722	1309 8	1124 2	3558 2
Aug-15	18196	1179 6	41788	13	367	747	5199	2945	11089	1763 9	1126 9	4017 7
Sep-15	16040	1176 8	39576	46	174	394	5481	2211	9903	1406 4	1098 6	3603 6
	16208 7	1E+0 5	381933	432	227 1	4974	4534 5	2416 2	93669	1E+0 5	8833 7	3E+0 5

TRANSHIPMENTS												
MONTHS	IMPORTS (DISCHARGE)						EXPORTS (LOADED)					
	FULL		TEU'S	EMPTYES		TEU'S	FULL		TEU'S	EMPTYES		TEU'S
	20'	40'		20'	40'		20'	40'		20'	40'	
Jan-15	2407	293	2993	47	67	181	1951	295	2541	0	0	0
Feb-15	2021	338	2697	73	150	373	1754	241	2236	73	169	411
Mar-15	763	83	929	0	0	0	1675	472	2619	127	47	221
Apr-15	1043	133	1309	0	0	0	380	110	600	0	0	0
May-15	685	100	885	284	103	490	531	105	741	0	0	0
Jun-15	683	123	929	171	106	383	517	92	701	8	47	102
Jul-15	561	100	761	0	34	68	491	95	681	61	0	61
Aug-15	789	210	1209	112	82	276	472	202	876	0	0	0

Sep-15	1309	145	1599	1	26	53	1130	149	1428	0	1	2
	10261	1525	13311	688	568	1824	8901	1761	12423	269	264	797
	TOTAL TEUS FROM JAN TO SEP											
	806422											

EXPORT PROCESS

Currently in Export we are using both manual and on line through KWATOS to process Exports

We will look at the manual system which runs along the KWATOS system.

For an Exporter to have his or her goods reach the buyer abroad the following process will apply

- 1.The need to identify a buyer
- 2.Identify a shipping agent and a shipping line
- 3.Identify a transporter and the unit carrier
- 4.Need to purchase a shipping order from the ships agent or shipping line.

A ships agent is a ships contractor

SHIPPING ORDER

Definition: Is a document issued by the ship carrier or its agent to the Exporter requesting for space on the board the vessel.

A copy is normally signed by the Master of the vessel confirming that cargo has been received on board the vessel and in its original condition.

FUNCTIONS OF A SHIPPING ORDER

It serves to show the list of Export cargo which has been booked for shipment on its account.

It requests the master of the ship to accept cargo declared there onboard his vessel.

STUFFING EXPORT AT THE GODOWN

With the shipping order and delivery note cargo is stuffed to a container in the presence of KRA officer who seals the container to confirm that the cargo inside tallies with what is declared on the shipping order and a customs entry is issued.

A customs entry allows cargo to be shipped.It is send to port on line.

Payments for the port and KRA are secured on line or by cash at port accounts and cargo allowed to proceed to the port entry.

BOOTH GATES

These are inbound and outbound entries where cargo is regulated to allow only legal and Authorised goods to enter and leave the port.

Once a KRA officer is satisfied with the documents KPA Export clerk generates a positionslip allowing the cargo to proceed to scanning before being offloaded at the Export yard.

Cargo can not be stacked in Export yard without a KRA release

CLUSTERING EXPORTS IN THE YARD

In Export yard containers are clustered to reduce ship waiting time in port.

They are arranged according to

- 1.ships name
- 2.port of discharge
- 2.commodity
- 3.weight
- 4.size.
- 5.height
- 6.special containers eg reefers,out of gauge,currency and explosives are segregated.

Apart from reefers which can be plugged at reefer point the rest follow under direct delivery.when the documents are not ready overheights can be stored in port but storage will apply immediately Export reefers can also follow direct delivery route.

HANDLING OF SPECIAL CARGOES

There are four major special cargoes

1.Reefers

Before discharging reefers the following steps should apply

- (a) Documents must be completed once it is confirmed that the container is pensharable it is plugged at reefer point. If it is dry it can be received in the regular blocks.
- (b) Confirm space at reefer point
- (c) A terminal tractor should be on quay
- (d) Handle with care
- (e) Confirm plugging at reefer point

2.Overheight containers

- (a) Documents must be complete
- (b) Delivery truck to be at quayside
- (c) Overheight gears to be at quayside
- (d) Handle with care

Incase the documents are not ready they can be received in yard but storage will apply up on landing to discourage congesting the yard.

3.Currency

- (a) Documents should be ready
- (b) KRA,police,and KPA security officers should be at quayside to escort the Cargo out of port
- (c) Delivery truck should be at quayside

4.Explosives

- (a) Documents should be ready
- (b) Delivery truck to be at quayside
- (c) KRA,police,fire and KPA security officers to be at quayside to escort The cargo out of port.

HANDING OVER EXPORTS

With a shipping order, positionslip, payment invoices and customs entry the agent hands over these documents to Export office where Berth records clerks generate Export loading list.

LOADING LIST

It is a compiled list of all handed over shipping order, quantities that are available in yard, due for loading on a particular vessel. Sometimes known as an onhandlist.

Details on the loadinglist

1. Ships name
2. Voyage number
3. Date of arrival
4. Port of discharge and destination
5. Operator
6. Container number
7. Shipping order number

8. Weight
9. Yard allocation
10. Commodity
11. Size
12. KRA release.

BILLING

Once the vessel is through with loading of Exports, the master of the vessel signs a copy of the shipping order which will be dispatched to Berth records clerk for reconciliation.

The purpose of the reconciliation is to validate containers loaded onboard the vessel and if any shutouts. After the reconciliation has been done, a shutout statement is prepared showing any shutout and if none a null shutout statement is done and forwarded to Billing for securing of KPA charges.

EXPORT WITHDRAWAL

Export withdrawal is a return out of port a container initially planned and delivered in to the port area for Exportation. This is done by the Shipper/forwarder through formal application stating the reason necessitating the withdrawal.

Reasons for withdrawing Exports

1. Damaged container
2. Need for repackaging

3. Change of mode of transport
4. An express order from a government agency e.g KRA, KWS, KEBS etc

Charges collected

Withdrawal charges include:

1. Withdrawal charges
2. Storage charges which apply from the indate to delivery date.

Export withdrawal Process flow

- An application for withdrawal is made by the shipper/forwarder to the HCO
- The shipper writes to KRA requesting the withdrawal release
- The shipping line should give a no objection letter to port management

With the three documents bearing the endorsement of either HCO or the POO(Shore), it is then dispatched to the Export Documentation Officer.

The documents are validated in respect to the status and the true owner of the container (who preadvised)

If they are corresponding and in order, then the processing commences through the CATOS system as follows:

- Container is cancelled from the CLL. (identify the container in the CLL, on cancel/Return column select return and select appropriate reason for the return)
- On Export pickup order menu, select Export return – the container preadvice – and select new on the menu.
- Fill all the mandatory fields plus the remark column
- Indicate the charges due on the remark column.
- Save and Interface for billing.

NB: Charges are raised through the document on line and the client allowed to withdraw the container within 24 hours after securing the charges.

EXPORT ACCEPTANCE

Export acceptance is given 24 hours before the vessel comes alongside

Exportorters are given 7 days to consolidate their cargo before the ship comes alongside.

UN-NOMINATED CONTAINERS

Unnominated containers are containers accepted and delivered in to the port prior to the nomination of the carrier vessel. They are only applicable to transit cargo.

PROCESS

The agent applies to management requesting for storage of un-nominated containers

Period allowed for un-nominated are

Coffee—15 days before attracting storage (transit)

Others—9 days for local

The management is now allowing transit cargo of Ugandan coffee only to be received as un-nominated cargo.

TRANSHIPMENT

Def. These are containers that are discharged from one vessel not for storage at the port and subsequent delivery by inland transport but for loading onto another vessel for shipment to the port destination.

TRANSHIPMENTS												
MONTHS	IMPORTS (DISCHARGE)						EXPORTS (LOADED)					
	FULL		TEU'S	EMPTY'S		TEU'S	FULL		TEU'S	EMPTY'S		TEU'S
	20'	40'		20'	40'		20'	40'		20'	40'	
Jan-15	2407	293	2993	47	67	181	1951	295	2541	0	0	0
Feb-15	2021	338	2697	73	150	373	1754	241	2236	73	169	411
Mar-15	763	83	929	0	0	0	1675	472	2619	127	47	221
Apr-15	1043	133	1309	0	0	0	380	110	600	0	0	0
May-15	685	100	885	284	103	490	531	105	741	0	0	0
Jun-15	683	123	929	171	106	383	517	92	701	8	47	102
Jul-15	561	100	761	0	34	68	491	95	681	61	0	61
Aug-15	789	210	1209	112	82	276	472	202	876	0	0	0
Sep-15	1309	145	1599	1	26	53	1130	149	1428	0	1	2
	10261	1525	13311	688	568	1824	8901	1761	12423	269	264	797
			TOTAL	28355	TEUS							

Procedure:

Agent applies for a permit through shipping line to Kenya Ports Authority (KPA).

A hard copy of manifest is attached to the application. Agent must identify the importing vessel and onward carrier vessel.

The letter is approved by the Head of Container operations and forwarded to the Export superintendent to process the permit.

The permit is prepared by the Export clerk after confirming the document details against the EDI manifest.

If in order, a permit is prepared and signed by the Export superintendent. In case the manifest is not in order, the client is referred to EDI manifest staff for amendment. If there is amendment, a C11 is prepared for the amendment of the manifest.

Charges are confirmed and underlined in the permit. The following are some of the charges.

- i. Storage due on the 16th day from the actual arrival time of the importing vessel.
- ii. Transfer charges
- iii. Alteration charges (in case of change of vessel)
- iv. Plugging charges for reefer containers
- v. Dangerous surcharge
- vi. Full import charges in case of ship store.

For storage, the first 15 days from the arrival of the vessel thereafter up to the date container is re-shipped the following charges will apply.

16 to 30 days \$ 15.00 for twenty feet

\$ 30.00 for forty feet

31 to 40 days \$ 20.00 for twenty feet

\$ 40.00 for forty feet

Over 40 days \$ 25.00 for twenty feet

\$ 50.00 for forty feet.

IMPORT DOCUMENTATION

1. INTRODUCTION.

In order to comprehensively discuss Import Documentation, it is very important to first of all understand and appreciate trade from an International perspective and the underlying economic dynamics which shape up International Maritime trade or the movement of goods from one country to another, especially via the sea.

The movement of goods by sea is a critical component of International trade since over 90% of the World trade moves by sea.

Preference to such a level is borne out of the obvious economic advantages of highly reduced cost through economies of scale where large volumes of cargo can be moved at the same time affordably.

Whilst the movement of trade by sea offers such preferred economic advantage, it is equally important to appreciate that there are factors which contribute to the advantage of economies of scale. These factors include, but not limited to, cargoes, ships and seaports.

Cargo availability, shipping capacity, logistics and seaports locations and services are primary critical factors that affect pricing and movement of trade by sea, imports not being an exception.

WHAT IS INTERNATIONAL TRADE

International Trade is the exchange of goods, and services across International borders or Territories. This is strongly supported by movement of goods by sea which accounts for over 90% International trade.

International Trade is also affected by:

- **Pattern of trade (trade model)** – which goods are traded by which countries, and how much of those goods are traded.

- **Gains from trade- why should nations exchange their products and services? Who is gainer and who is loser, if there is any?**
- **Protectionism: should we protect our industries from International competition? Using what selection criteria? What may be economic consequences of trade protectionism or trade liberalization?**
- **Free Trade Agreements (F T As) what are the required criteria to benefit from a special FTA? What are policies to be considered? How to measure the impact on trade between countries; members and non-members?**

Trade and development: - What are the impacts of trade on industrial specialization?

Why are goods and/ or services exchanged across international borders?

International trade or the exchange of goods, and services across International borders or Territories arises from two primary reasons viz ;

- **Absolute advantage**
- **Comparative advantage**

Absolute advantage: is the situation where country A has resources (x) which are sufficient to meet the demands of its domestic market and a surplus . At the same time country B does not, at all, have resources x but requires them to meet demands of its domestic market.

In this case country A has absolutely advantage over country B concerning resources x therefore compelling country B to import the resources x from country A

The lack of resources x and surplus of same leads to the exchange of goods across International borders hence International trade.

Comparative advantage: is where country A and B, both have same resources x however country B does not have enough (deficit) to meet the demands of her domestic market while country A has the resources in surplus.

This means that despite country B having similar resources as country A, country B has a deficit of such resources and is therefore compelled to import the resources from country A. Another contributor to this is the economic advantage enjoyed by one country over the other being able to cheaply produce a given commodity than the other.

This scenario leads to the exchange of goods across International borders hence International trade.

The role of Shipping and Port services in International Trade.

Shipping and Port services plays an indispensable and integral role in International trade since they are responsible for facilitating and regulating efficiency and connectivity to other land based modes of transport in the International maritime transport chain

None the less, Shipping and Ports services are a derived demand.

It is out of the need to move cargo from one country to another (import/ export) that the need for transporting the cargo and offloading same at the port of discharge come in to being.

Therefore the need to move cargo from one country to another by sea in International trade creates the demand for Shipping and Port services.

In this case therefore, shipping and Port services are a derived demand out of the need to move cargo from one country to another.

2. IMPORT DOCUMENTATION.

Background.

What is Import? - Import refers to commodities, articles. Or service brought in to a country from abroad / another country mainly for purpose of sale. Is also known as inbound.

What is Documentation;- Documentation refers to materials that provide official information or evidence or that serve as a record.

Nonetheless it is important that import Documentation is not an end in itself but a means to an end.

It is evidence of International transaction or International sales agreement and is used to facilitate sales contracts, International payment, contract of affreightment , customs clearance and removal of import cargo from the seaport etc.

The import process and the Documents used to facilitate its International Trade.

Import begins from the time a consignee has a need for goods / services that may not necessary be available locally.

The consignee will then look for a person/ company that can meet his /her needs.

This will then lead to an International sales contract which will spell out, among other things , how payments will be done in exchange of

the goods/services. The **INCOTERMS** will be applied in the respective sales contract to determine the responsibility of each party.

What are INCOTERMS?

Incoterms are trade terms published by the International Chamber of Commerce (ICC) that are commonly used in both International and domestic trade contracts.

Incoterms, short for International Commercial Terms are used **to make International trade easier by helping traders in different countries understand one another**

Why Incoterms

Trade terms used in different countries may appear identical on the surface but actually have different meanings as they are used domestically. Incoterms are internationally recognized and thus help to prevent confusion in terms of foreign trade contracts, by helping sellers and buyers understand their obligations in any transaction.

Examples of incoterms include DAT (Delivered at Terminal), DDP (Delivered Duty Paid) and CIF (Cost, insurance and freight) , DES (Delivered Ex ship), FAS (Free alongside), FOB (Free on board) etc.

The buyer and seller will then meticulously agree and engage the payment process.

Since both the International seller and International buyer do not know each other and neither the credit worthiness of each other, a form of guarantee is sort in the payment process so that the buyer does not risk by sending money and then not getting the product. The buyer and the seller would want to cushion him/herself from such risk. A letter of credit would be engaged at this position.

What is a letter of credit?

Commonly abbreviated as LC , a letter of credit is a letter from a bank guaranteeing that a buyers payment to a seller will be received on time and for the correct amount in the event that the buyer is unable to

make payment on the purchase , the Bank will be required to cover the full or remaining amount of the purchase.

Why a letter of credit

Letters of credit are often used in International transactions to ensure that payment will be received. Due to the nature of International dealings including factors such as distance, differing laws in each country and difficulty in knowing each party personally, the use of letters of credit has become a very important aspect of International trade.

The Bank also acts on behalf of the buyer (holder of letter of credit) by ensuring that the supplier will not be paid until the Bank receives a confirmation that the goods have been shipped.

THE ISSUING LETTER OF CREDIT BY THE BANK WOULD ALSO REQUIRE A CLEAN BILL OF LADING SO AS TO RELEASE PAYMENTS TO THE INTERNATIONAL TRADER.

What is a clean bill of lading?

A clean bill of lading is a shipping document issued by a carrier declaring that the goods have been received in an appropriate condition, without the presence of defects. The product carrier will issue a clean bill after thoroughly inspecting the packages for any damage, missing quantities or deviation in quality.

Why is a clean bill of lading necessary in issuance of a letter of credit?

Often a clean bill of lading must be used to fulfil the requirements set forth in letters of credit, many purchasers rely on letters of credit to pay for imports and Banks may refuse to supply the funds if a claused bill of lading is presented. A claused or foul bill is issued when the received product is damaged or does not meet specifications.

Depending on the INTERCOMS agreed by the consignor and the consignee in the International sales contract, space on board a ship

will be booked for cargo to be transported to the consignee. **A bill of lading** will be issued against the cargo loaded.

What is a bill of lading?

A bill of lading commonly abbreviated B/L is a legal document- in shipping – between the shipper of a particular good and the carrier detailing the type , quantity and destination of the good being carried.

The bill of lading also serves as a receipt of shipment when the good is delivered to the predetermined destination. Bills of lading serve three functions:

- As a Title of goods
- Evidence of contract of carriage
- Receipt of shipment

The bill of Lading must accompany the shipped goods, no matter the form of transportation, and must be signed by an authorized representative from the carrier, shipper and receiver.

After issuance of the B/L, the ship's agent or shipping line will generate **a cargo manifest**.

What is a cargo manifest?

A manifest or ships manifest is a document listing the cargo, passengers, and crew of a ship, aircraft, or vehicles, for the use of customs and other officials.

The manifest may be used by people having an interest in the transport to ensure that passengers and cargo listed as having been placed on board the transport at the beginning of its passage continue to be on board when it arrives at its destination.

Upon arrival at the port of destination, the ship must be issued with a clean bill of health normally called **free pratique**.

What is a free pratique

Free pratique is the permission granted by local medical authorities, denoting that the vessel has a clean bill of health so that people may embark and disembark.

Further, in the event that the ship is a frequent caller to the port of destination (e.g. Mombasa) and may want to be exempted from compulsory pilotage, then the Shipping Line may apply for an exemption and once approved will be issued with an exemption certificate from compulsory pilotage.

Once the ship is berthed, a ship supervisors working report is prepared which records any arising delays before berthing, during cargo handling operations and after completion of cargo operations but before de-berthing of the respective ship.

In case the import cargo to be discharged is damaged, then such cargo will not be handled by KPA until a letter of indemnity is issued by the Shipping Line absolving the Port from any arising and relatable responsibilities.

Once cargo is discharged from the vessel, a Discharge Tally is prepared by KPA to account for the receipt of import cargo at the Port. With the transition of operations from manual to Digital these containers are accounted through the use of HHTS (Hand Held Terminal)

The discharged cargo will then be transferred from the quay side to the storage area where it will be stacked.

Upon receipt of cargo at storage area, a Movement Tally is prepared to account for the receipt of cargo at the storage area and indicate the physical allocation of the cargo stack. This is also being done through the use of HHTS.

Incase an accident happens at the storage area and the stacked import cargo is damaged as a result therefore, an accident report is prepared.

The consignor would have engaged a forwarder to facilitate the customs and other related cargo clearance administrative procedures.

The forwarder will engage the respective Ship's Agent for the issuance of a Delivery Order.

What is a Delivery Order.

A Delivery Order (abbreviated D/O is a document from a consignor, a shipper, or an owner of freight which orders the release of the transportation of cargo to another party.

The forwarder will also fill in the Import Declaration Form (IDF) with the Customs as a declaration of intention to bring in to the country goods from a foreign country.

The Forwarder will then fill out the appropriate Customs Entry for purpose of payment of Duty, excise, VAT etc.

Once the necessary releases have been issued, the forwarder will then use the KPA Tariff for understanding which Port charges are applicable in the clearance of Import cargo from the Port.

The Forwarder will then submit a Pick-up Order through KWATOS so as to be able to pay applicable Port charges and for clearance of the Import from the Port.

The Forwarder is then able to view respective KPA invoice through the biller Direct portal.

After Port charges have been paid, the Forwarder then brings his/her truck to the Port so as to collect the Import cargo.

At the entry gate, the Forwarder will be issued with a Position Slip after the truck has been processed for entry.

Upon arrival at the storage area , the Forwarder will present necessary documents for verification then the Import cargo will be loaded on to the truck.

A movement Tally will be prepared to account for the Delivery of the Import cargo from the stacked position on to the truck. Using the CATOS system and upon verifying completion of documentation, the container is loaded onto a hinterland truck using HHT (positioning it as outgoing). The same container details will then be reflected at the booth gates as outgoing ready to be delivered out.

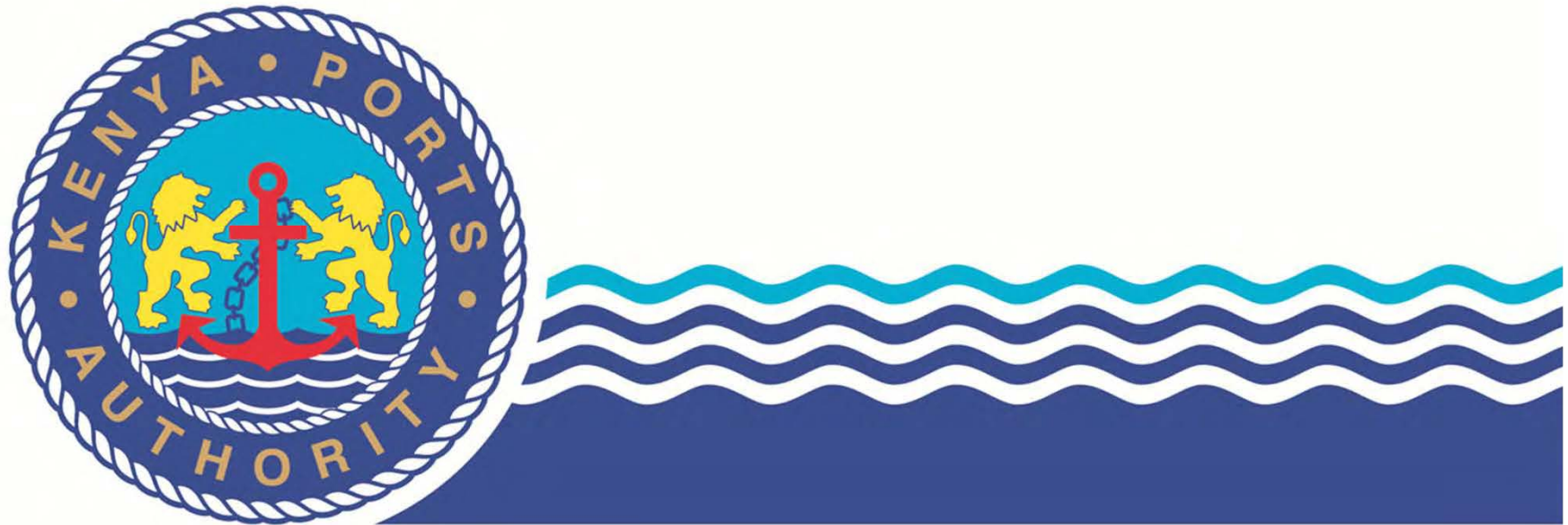
The truck will proceed to the exist gate and after verification, a Gate Pass is issued. If Delivered through the use of HHTS then the exist Gate clerk is able to confirm through the CATOS system.

The laden truck leaves the Port with the Import cargo.

There are two main Import processes namely; the local Import cargo clearing processes and the transit Import cargo clearing processes.

These two distinct processes and clearly shown on the attachment. (Refer to the attachment).

Statistics Section

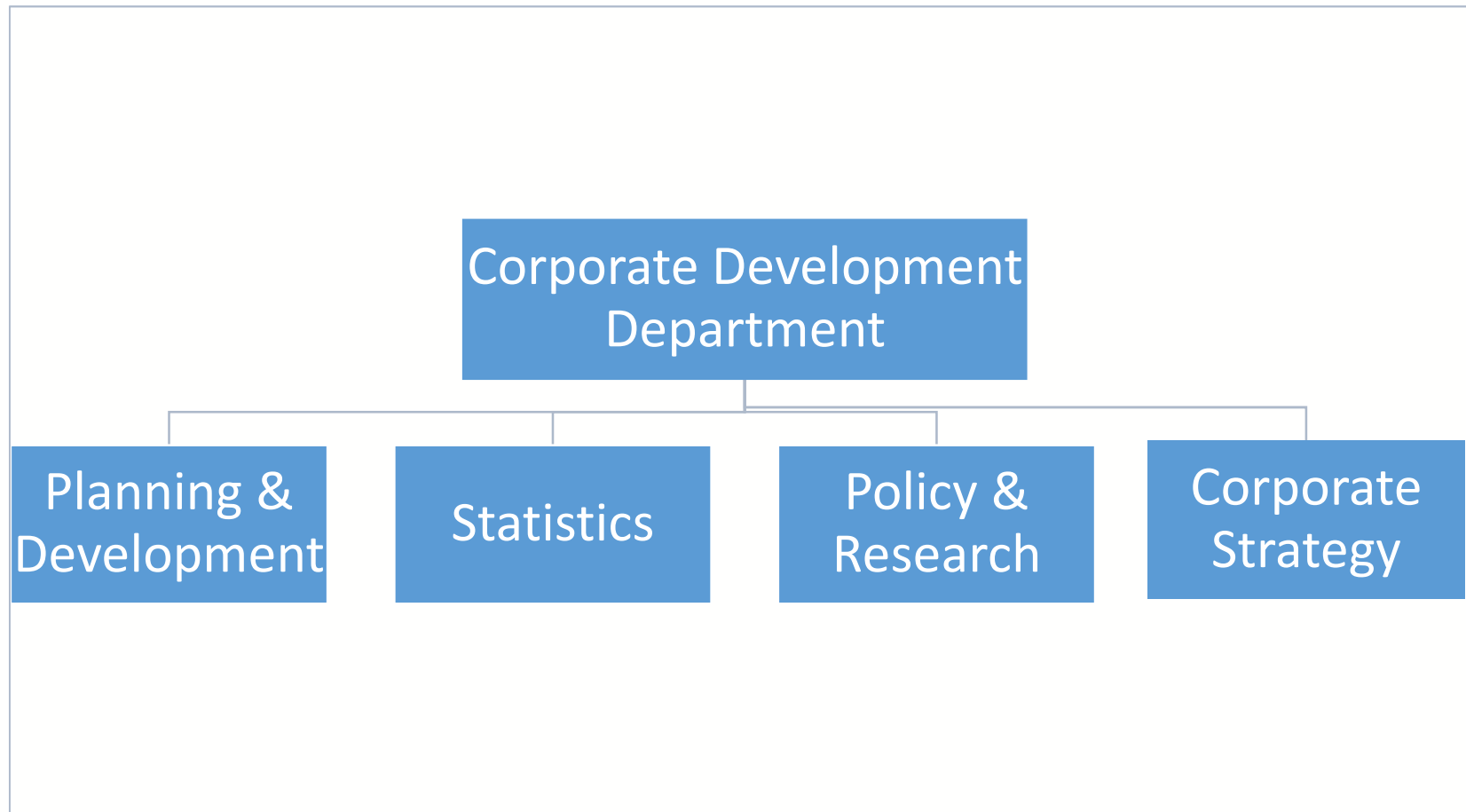




Statistics Section Objectives

- To provide timely, periodic and accurate statistical information to management and port stakeholders
- To implement the statistical policy which defines strategies and objectives pertaining to data collection, collation, compilation, analysis and timely dissemination of statistical information.

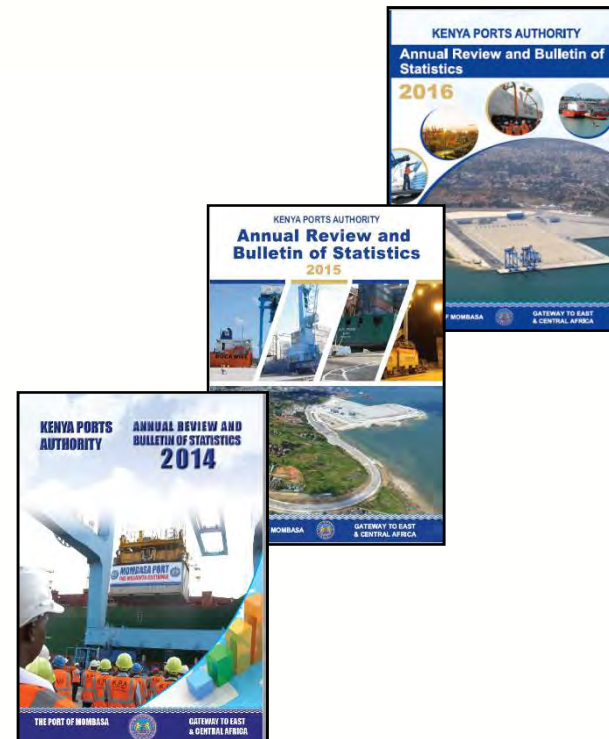
Structure of the Corporate Development Department



Key Deliverables



- Monthly Highlights
- Monthly Reports
- Quarterly Reports
- Annual Reports
- Bulletin of Statistics





Types of Data

Throughput Traffic (DWT)-Sum total of all cargo handled (imports/exports)

Calculated based on the type of cargo;

- Non- containerized cargo`
 - Dry Bulk i.e. clinker, fertilizer, coal, wheat
 - Liquid bulk i.e. oil & lubricants
 - Conventional/general cargo i.e. Motor cars, steel, cement, fertilizer

Throughput traffic (DWT): 2006 - 2015



YEAR	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
IMP	11,845	13,061	13,311	16,508	16,201	16,938	18,732	19,150	20,777	22,680
EXP	2,255	2,474	2,685	2,449	2,575	2,788	3,045	2,983	3,366	3,534
T/SHIP	318	426	419	105	158	227	143	174	732	518
TOTAL	14,419	15,962	16,415	19,062	18,934	19,953	21,920	22,307	24,875	26,732



Types of Data Cont'd



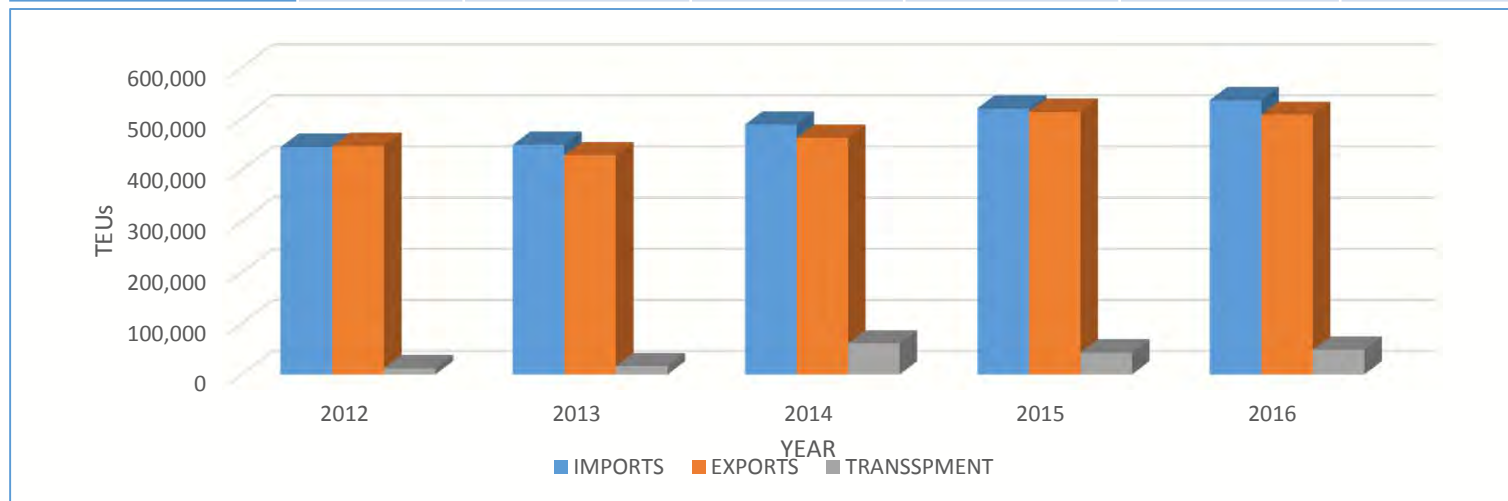
Container Throughput Traffic - (TEUs)

- Imports - Full/empty
- Exports – Full /Empty
- Transshipment- Full / Empty

Container Traffic (TEUs): 2012 - 2016



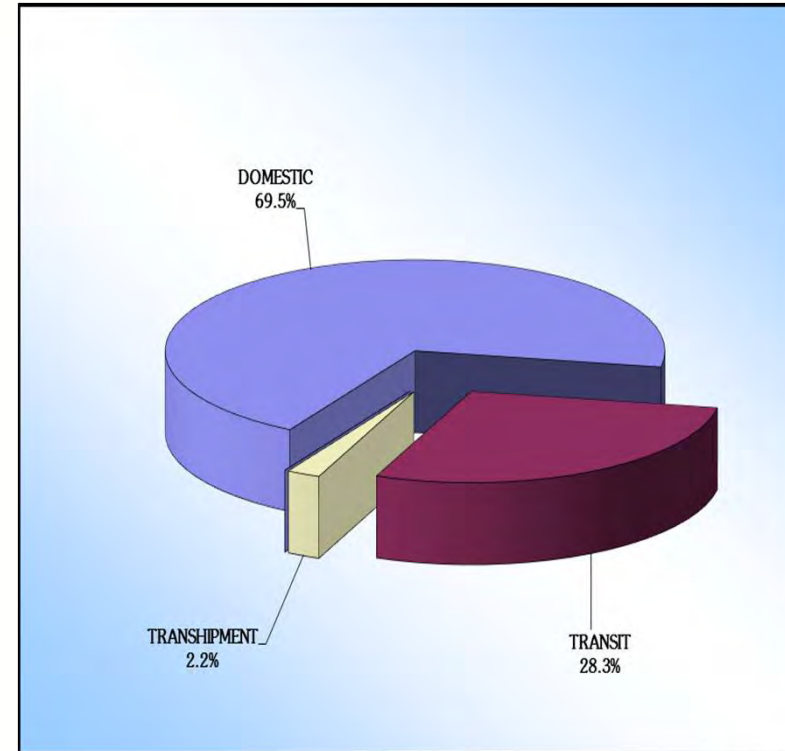
		2012	2013	2014	2015	2016
IMPORTS	Full	441,067	441,004	482,055	514,086	527,816
	Empty	3,705	8,385	6,617	5,970	8,167
TOTAL		444,772	449,389	488,672	520,056	535,983
EXPORTS	Full	120,712	129,522	130,757	121,531	128,913
	Empty	325,912	298,820	331,719	391,841	378,444
TOTAL		446,624	428,342	462,476	513,372	507,357
TRANSHIPMENT	Full	10,553	12,118	52,707	37,384	42,586
	Empty	1,514	4,151	8,147	5,306	5,445
TOTAL		12,067	16,269	60,854	42,690	48,031
TOTAL	Full	572,332	582,644	665,519	673,001	699,315
	Empty	331,131	311,356	346,483	403,117	392,056
TOTAL		903,463	894,000	1,012,002	1,076,118	1,091,371



Market Segmentation-2016



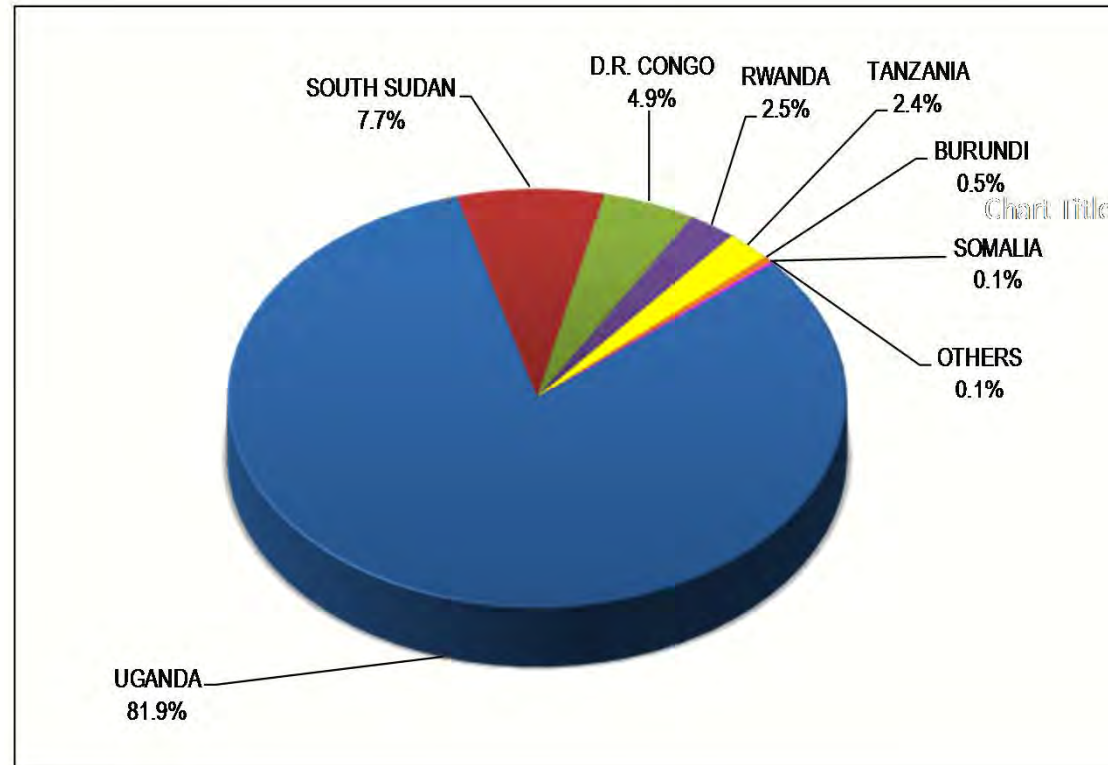
- Domestic
- Transit
- Transshipment



Transit Market- 2016



- Uganda
- Sudan
- D.R.C
- Rwanda
- Tanzania
- Somalia
- Burundi





Performance indicators

▪ **Services indicators**

Service indicators measure the quality of service provided to customers – ship owners, ship operators, porters, transport operators, etc. The most common indicators are:

- ❖ Ship turnaround time
- ❖ Truck turnaround time
- ❖ Container dwell time
- ❖ Equipment availability

Contn'd



- **Utilization Indicators**

Measure how intensively port facilities are used i.e. percentage of actual use of resources and maximum possible use of those resources over a period of time.



Contn'd

▪ **Berth Occupancy**

- Is the ratio of time the berth is occupied by a vessel to the total time available in that period.
- High berth occupancy is a sign of congestion ($>70\%$) and hence decline of services, while low berth occupancy signifies underutilization of resources



Contn'd

- **Storage (Yard) utilization**
- Yard utilization is the ratio of number of storage slots(number of containers on hand) to the number of available slots (Terminal capacity).
- The maximum storage capacity for MSA port is set to 65% to avoid yard congestion.



Contn'd

▪ **Productivity indicators**

- Measures of the **efficiency** and **cost effectiveness** of the terminal operations, i.e. the ratio of output achieved, and to effort put in, and is expressed in terms of quantity of production achieved per unit of resource in unit time.
- These measures indicate how effectively **labor, equipment** and **land** are being used.



Contn'd

- **Ship productivity** – measure container handling rates for a ship's call (container moves/ship-hour in port or at berth or per working hour). The indicator does not consider resources put into operation.
- **Crane productivity** - measure handling rates of a crane(container moves/crane hour)

Performance Indicators: 2011 - 2016



PERFORMANCE INDICATORS	2011	2012	2013	2014	2015	2016
1. SERVICE INDICATORS (Days)						
Ship Turnround Time	4.3	4.0	3.5	3.5	3.5	2.9
Import Container Dwell Time	7.2	7.1	5.0	3.9	4.8	4.0
Ship Waiting Time : Gross	1.1	1.0	0.6	1.0	0.9	0.3
Ship Waiting Time: Net	2.1	2.8	2.1	2.8	2.4	1.7
2. UTILIZATION INDICATORS						
Berth Occupancy (%)						
Mombasa Container Terminal (MCT)	94.5	75.7	82.8	93.0	91.4	73.3
Conventional Cargo (GC)	63.9	61.0	61.4	64.4	63.5	52.9
Kipevu Oil Terminal (KOT)	84.5	80.2	83.5	79.4	86.0	86.6
Shimanzi Oil Terminal (SOT)	81.8	80.1	77.5	75.7	79.2	82.7
Mbaraki (MBK)	76.2	79.3	56.0	62.2	55.8	40.9
3. OUTPUT INDICATORS						
AVG.Tonnage of cargo per gang shift	523	614	645	642	698	916
AVG.Tonnage of cargo per ship working day	3,477	4,127	4,410	4,645	5,036	6,998
4. PRODUCTIVITY INDICATORS						
Ship productivity (MCT) Moves per hour: Gross	12.9	17.4	16.7	17.1	24.3	29.1
Ship productivity (MCT) Moves per hour: Net	14.0	18.1	17.7	17.8	25.3	30.0



Q & A



END

THANK YOU



PMAESA

Port Management Association of Eastern & Southern Africa



STUDY ON DEVELOPMENT OF PORT STATISTICS AND PERFORMANCE INDICATORS IN PMAESA PORTS



Manual for Port Statistics Conventions and Definitions



Funded by



June 2011

Undertaken by



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DEVELOPMENT OF PORT STATISTICS AND PERFORMANCE INDICATORS IN PMAESA PORTS

Introduction

Ports in PMAESA region are aware of the need to keep statistics, and generally keep similar kind of statistics, which though differs in depth, quality, coverage and interpretation depending on composition of traffic handled by the port, economic nature of traffic (containerized, transit, transshipment), revenue and marketing strategy. Ports on compiling ports statistics are faced with peculiar problems, which include:

- Inadequate data capture: this refers to the mixture or existence of only manual or electronic data capture in ports. The degree of data capture determines the depth and accuracy of data prepared.
- Limited use of data prepared: while ports have the capacity to establish within themselves data collection centres, ports are limited on the correct data to be extracted or analysed for various uses in the port e.g. correct data extraction for pricing (tariffs), marketing and improvement of productivity purposes.
- Limited information on performances and competition of ports in the region. Ports have not established benchmark information on performances of their competing ports. Most ports operate in a closed manner and exchange with other ports limited or no information.

Against this background, PMAESA in collaboration with COMESA, EAC, and SADC commissioned a study to develop a harmonized framework for port statistics and performance indicators and a statistical database that will be accessible and regularly updated with data from ports.

The study observed that a few ports do not have dedicated statistical units, and hardly any port has professional statisticians. Statistics are sometimes generated on an ad hoc basis, and mainly upon request. The data required by PMAESA Secretariat is therefore not readily available.

There are no statistical databases or data warehouses managed professionally. Most statistical data is managed using Excel worksheets which have limited data security.

Discrepancies have been observed in data from different offices in the same port. Also there are notable discrepancies between the soft and hard data copies supplied to Consultant.

Inconsistencies have also been observed in data in different tables' e.g. overall total of cargo by cargo type being different from totals by commodities or destinations.

There is limited coverage of port statistics and performance indicators maintained by ports. The situation is worse in performance indicators where majority of the ports maintain a few and others do not provide any performance indicators. In general, there is limited data on

performance indicators, yet these can be obtained by querying the billing and job scheduling systems in use.

The study also observed that the majority of ports in PMAESA ports are aware of the UNCTAD manual on a uniform system of ports statistics and performance indicators yet only few ports use the guidelines on conventions and definitions while compiling ports statistics. The table below summarizes the usage of UNCTAD guidelines for port statistics and performance indicators in ports visited.

Utilization of UNCTAD Guidelines on a uniform system of ports statistics and performance indicators by PMAESA Ports

Port	Usage of UNCTAD Manual/guidelines	Remarks
Port Sudan	Port aware of UNCTAD guidelines but limited in utilization.	More training required
Djibouti	Port aware of UNCTAD guidelines, but hardly produces any indicators.	More training required
Mombasa	Port aware of UNCTAD guidelines. Has a handy Statistical Policy and Manual	More training required
Dar es Salaam	Port aware of UNCTAD guidelines and utilized the guidelines.	Increase of staff and more training is required
Port Victoria	Port not aware of UNCTAD guidelines.	Only one staff in statistical unit. Increase of staff and more training is required
Port Louis	Port aware of UNCTAD guidelines but limited in utilization.	Increase of staff and more training is required
Maputo	Port aware of UNCTAD guidelines but produces a limited set of indicators.	Increase of staff and more training is required
Durban	Port aware of UNCTAD guidelines but produces a limited set of indicators.	Need more cooperation from private operators
Cape Town	Port aware of UNCTAD guidelines but produces a limited set of indicators	More training required
Walvis Bay	Port aware of UNCTAD guidelines but uses other guidelines (GLC).	No trained statistician or statistical unit. Statistics compiled by accounts and revenue department. Recruitment of statisticians and training is required.

Chapter 1: Summary of Port Statistics, Performance Indicators, and Definitions

Port statistics refers to the general statistics on the number and tonnage of shipping calling at the ports and of the volume of cargo handled measured in metric tonnage (metric tons) for all cargo types, and TEUs for containers. It is worth noting, port performance indicators are also port statistics but tools of measurement of the ports performances. The ships on ports statistics are measured and recorded in numbers and tonnages of shipping calling.

Performance indicators are analytical part of port statistics and quantified as mathematical formulas in order to be objective and calculated in a harmonized way. Performance indicators can further be categorized into port operational performance indicators and financial indicators as indicated below. The study focuses more on operational performance indicators.

Operational performance indicators

The operational performance of a port is generally measured in terms of the speed with which a vessel is dispatched, the rate at which cargo is handled and the duration that cargo stays in port prior to shipment or post discharge. Important information and elements to maintain are the number of ships arrivals (arrival rate); ship's time in port (waiting time, service time, and ship turn-round time); fraction of time berthed ships worked; number of gangs employed per ship per ship; tons per ship hour in port and at berth; tons per gang hour; and fraction of time gangs idle.

Financial performance indicators

These are measures of the cost/revenue performance of various areas of the port. Various elements taken into consideration include:

Revenue: the ships revenue that may come from berth occupancy charges (ship revenue related to the berth group or type of berth -e.g. dry bulk terminal for coal or iron ore) and port dues; cargo revenue related to the cargo handling services and services of the berth group (cargo dues).

Cost/expenditure: labour costs; and capital expenditures.

The chapter introduces below a summary table of commonly utilized conventions, definitions and data sources for port statistics and performance indicators. Details for the description and computation are provided in the subsequent chapters 3 and 4.

Summary table of ports statistics, performance indicators conventions, definitions and sources

Category	Indicator/Convention	Description/Definition	Periodicity	Data Source
(A) Cargo Statistics	Port Traffic	Port traffic refers to all goods or cargo that has used the port as the transfer centre. Cargo is only counted once as long as it makes use of the port as the transfer centre. Excludes double counting activities such as shifts, reloading, and transshipment out.	Monthly/ Quarterly/ Annual	Time Sheets, Cargo Manifest, Shipping Orders, Monthly/ Quarterly/Annual Statistical Report/Bulletin
	(i) Inward cargo	Inward cargo either for national use or transit cargo continuing to foreign destination by land or inland waterway	Monthly/ Quarterly/ Annual	
	(ii) Outward cargo	Outward cargo either of national origin or transit cargo arriving in port from a foreign destination via land or inland waterway	Monthly/Quarterly/ Annual	
	(iii) Transshipment cargo	Transshipment cargo either national or international (foreign bound) and only counted once when discharged	Monthly/ Quarterly/ Annual	
	Port throughput/ Berth throughput	Same like port traffic, but unlike port traffic, takes into account all activities, operations and resources availed to handle cargo irrespective of its final destination. Includes shifting or reloading of goods erroneously discharged and transshipment out as they use ports resources.	Monthly/ Quarterly/ Annual	
	Transshipment	Cargo traffic designated by transfer of goods from a sea-going vessel to another sea-going vessel before the place of final destination has been reached.	Monthly/ Quarterly/ Annual	
	Transit traffic	Transit traffic is goods or cargo coming into the country (not originating or destined into the country) which is dispatched either by road, rail or inland waterway. However, incoming cargo not destined into the country but dispatched at the port by coaster or sea going vessel becomes transshipment	Monthly/ Quarterly/ Annual	
	Principal export & import commodities	Listing of export and import commodities handled and their tonnages	Monthly/ Quarterly/ Annual	
	Origin/destination	Commodities by major export and import trading partners in tonnages.	Monthly/ Quarterly/ Annual	
	Bunkers loaded	Fuel (e.g. coal or fuel oil) used aboard a ship.	Monthly/ Quarterly/ Annual	
	Receipts/ deliveries by road, rail or inland water	The exports for ships loading and imports deliveries by road, rail or inland water	Monthly/ Quarterly/ Annual	
	Deep sea traffic	Transport of cargo by sea other than sea bordering the country/region. It is the amount of traffic transported by sea that crosses country borders.	Monthly/ Quarterly/ Annual	

	Coastal/coastwise traffic	Traffic to and from ports on the enclosed sea bordering the country/region. It is the amount of traffic transported by sea directly between ports located within the same country.	Monthly/ Quarterly/ Annual	
	Vehicles traffic	Number of automotive units discharged/ loaded	Monthly/ Quarterly/ Annual	Time Sheets, Cargo Manifest, Gate pass
(B) Ship Statistics	Ship calls	Ship calls is the number of ships calling at a port per year including both international and domestic traffic.	Monthly/ Quarterly/ Annual	Vessel Declaration, Harbour Master's Log, Lloyd's Register of Ships (equivalent publication) , Manifest
	Ship type	UNCTAD International Classification of Ship Types, which include container, general cargo, liquid bulk (oil tanker), dry bulk, specialized carrier (e.g. vehicle, livestock or chemical carrier), fishing, tug, passenger ships, barge, naval, others.	Monthly/ Quarterly/ Annual	
	Dead Weight Tonnage (DWT)	DWT is sum of weight of cargo, fuel, lubricating oil, fresh water, ballast, usable supplies, passengers, crews and their possession. Maximum DWT is the amount of weight a ship can carry without riding dangerously low in the water i.e. a weight a ship can carry safely.	Monthly/ Quarterly/ Annual	
	Gross Tonnage (GT)	The tonnage of a ship is not a weight, but a volume. One ton is 100 cubic feet. The total internal volume of a ship is its gross tonnage, and if we subtract all the volume not used for cargo, we get the net tonnage.	Monthly/ Quarterly/ Annual	
	Gross Registered Tonnage (GRT)	GRT is a measure of the internal volume of a ship, which has been replaced by GT. Like GT, GRT is not a measure of the ship's weight or displacement (mass), but a volume.	Monthly/ Quarterly/ Annual	
(C) Operational / Performance Statistics				
(i) Service indicators		The service indicators show the quality and extent of services provided by the port		
	Ship related			
	Port time	Ship's turn-round time=waiting time + service time	Monthly/ Quarterly/ Annual	Forms recording movements within the port:
Average port time	Average port time= (cumulative time for waiting + service time)/total number of ships	Monthly/ Quarterly/ Annual	Harbour Master's Log,	

	Waiting time	Waiting time is the cumulative time spent by all ships in the port waiting for berth, documents, pilot, tug, bad weather, availability of cargo, gang, beginning and change of shift etc. Waiting time = cumulative time spent by all ships for waiting time IN + waiting time OUT	Monthly/ Quarterly/ Annual	Harbour Masters Report, Pilot Log
	Service time	Service time includes the pre and post berthing time, i.e. the time pilot is on board and the berth time. Service time = port time – waiting time	Monthly/ Quarterly/ Annual	
	Berth time	Berth time is the first-to-last time that a ship is at berth. Berth time = Berthing time – de-berthing time	Monthly/ Quarterly/ Annual	
	Cargo related			
	Dwell time	Cargo dwell time is the duration of cargo remaining in port before being loaded on board or collected for domestic or transit distribution. It is the time cargo remains in a terminal's in-transit storage area while awaiting shipment or collection by clearance transportation. The main indicator recorded is dwell-time for containerized cargo (average container dwell time for imports and exports full and empties, and transits by countries). Measured as days/container.	Monthly/ Quarterly/ Annual	
(ii) Output indicators	Berth output/ berth throughput	Berth output measures the total tonnage or units of cargo handled at berth in a stated period of time		The time sheets filled in by the handling supervisors
	(i) General cargo berth throughput	General cargo berth indicator = total tons/1 year on the berth concerned	Monthly/ Quarterly/ Annual	
	(ii) Container berth (s) throughput	Containers berth indicator = total TEU/1 year on the berth concerned	Monthly/ Quarterly/ Annual	
	(iii) Ro-Ro berth throughput	Ro-Ro berth indicator = total vehicles or rolls/1 year on the berth concerned	Monthly/ Quarterly/ Annual	
	(iii) Dry bulk berth throughput	Dry bulk berth indicator = total tons/1 year on the berth concerned	Monthly/ Quarterly/ Annual	
	(iv) Liquid bulk berth throughput	Liquid bulk berth indicator = total tons/1 year on the berth concerned	Monthly/ Quarterly/ Annual	
	Ship Output	Ship output measures the rate at which cargo is handled to and from a vessel in port or at a berth		The time sheets filled in by the handling supervisors
	(i) Tons per ship hour	Tons per ship hour in port = tons/ship hours in port=tons/ship/hour in port	Monthly/ Quarterly/ Annual	
	(ii) Tons per ship hour at berth	Tons per ship hour at berth = tons/ship hours at berth=tons/ship/hour at berth	Monthly/ Quarterly/ Annual	

			Annual	
	(iii) Tons per ship hour worked	Tons per ship worked hour = tons/ship worked hours=tons/ship/worked hour	Monthly/ Quarterly/ Annual	
	Gang Output	Gang output indicator is the average tons of cargo handled within a stated period		Time Sheets, Labour Handling Summary Sheet, Idle Time Form, Summary Sheet
	Average output per gang hour (tonnage handled)	Average output per gang hour = tonnage handled/(gang x hours worked)	Monthly/ Quarterly/ Annual	
	Average output per gang hour (Container TEUs handled)	Average output per gang hour = total TEU (or boxes) handled/(gang x hours worked)	Monthly/ Quarterly/ Annual	
(iii) Utilization indicators		Utilization indicators are measures of how intensively port facilities and resources are used		
	Utilization of berth			Weekly Register of Occupation, Berth Occupancy form, Time sheet
	Berth occupancy	Berth occupancy = yearly working hours/365x24 hours	Monthly/ Quarterly/ Annual	
	Idle time ratio	Idle time ratio = total cumulated annual idle time in hours/annual working hours	Monthly/ Quarterly/ Annual	
	Utilization of equipment			
	(i) Availability ratio	Availability ratio = annual hours of availability/365x24 hours	Monthly/ Quarterly/ Annual	Information provided from time sheets
	(ii) Rate of utilization	Rate of utilization = annual worked hours/365x24 hours	Monthly/ Quarterly/ Annual	
(iv) Productivity indicators		Productivity is the measurement of the volume handled per unit of time		
	Ship productivity	Ship productivity, the divider (denominator) is the duration of the call in the port, which is usually either the total turn-round time (port time), time at berth or ship working time.	Monthly/ Quarterly/ Annual	
	(i) In port	Ship productivity (gross) = total moves/port time	Monthly/ Quarterly/ Annual	Time Sheets (e.g. stevedore time sheet), filled in by the handling supervisors, Terminal Performance Report, Traffic Sheets
	(ii) At berth	Ship productivity (gross) = total moves/berth time	Monthly/ Quarterly/ Annual	
	(iii) Working	Ship productivity (gross) = total moves/working time	Monthly/ Quarterly/ Annual	
	Crane Productivity	Crane productivity, the divider is the number of gross or net crane hours. Net crane hours is gross crane hours less delays crane hours	Monthly/ Quarterly/ Annual	
	(i) Crane productivity (gross)	Crane productivity (gross) = total moves/crane hours	Monthly/ Quarterly/ Annual	
	(ii) Crane productivity (net)	Crane productivity (net) = total moves/net crane hours	Monthly/ Quarterly/ Annual	

Chapter 2: Port Statistics

Port Traffic

Port traffic refers to all goods or cargo that has used the port as the transfer centre. Thus irrespective of same consignment handled in a number of port activities, the cargo is only counted once as long as it makes use of the port as the transfer centre. The resources or number of activities involved in handling the same cargo are irrelevant when computing port traffic. Activities such as shifting or reloading of goods erroneously discharged do not increase actual amount of cargo received or loaded at the port and are therefore excluded from port traffic count. The definition or computation of port traffic which is also adopted by UNCTAD manual of port statistics and performance indicators comprises the following three classes:

1. Inward cargo either for national use or transit cargo continuing to foreign destination by land or inland waterway.
2. Outward cargo either of national origin or transit cargo arriving in port from a foreign destination via land or inland waterway.
3. Transshipment cargo either national or international (foreign bound) and only counted once when discharged.

Port Throughput and Berth Throughput

The concept or method of computing port throughput and berth throughput is the same. The port throughput is equal to berth throughput in case of ports with only one berth. For ports with more than one berth (e.g. 5 berths), the port throughput is equal to the total throughput of the berths handling cargo. For a port with 5 berths, the port throughput is equal to the sum of the 5 berths throughput. The port or berth throughput takes account of various activities, operations and resources availed to handle cargo irrespective of its final destination. Thus the tonnages or TEUs for reloading of cargo discharged by error or shifting of cargo via the quay will be counted as an activity of the port/berth throughput, and counted in two directions (i.e. counted twice). Shifting of cargo in vessels holds is counted only once.

Cargo discharged from or loaded into a vessel at the quay will be included in both berth throughput and port traffic.

Transshipment via the quay will be counted twice in berth throughput. Direct transshipment from one ship to another is however counted once as only one gang or equipment is involved in one direction. However, transshipment cargo whether national or international will be counted only once in the port traffic.

Cargo transferred from one vessel into another (e.g. due to equipment breakdown or cancellation of a call) will be treated as transshipment cargo and counted twice if the operation is via quay, and once if directly into another ship. The cargo is not included in the port traffic.

Both port traffic and berth throughput are measured in metric tonnes unless otherwise stated (e.g. for container berth also measured in TEUs).

Transshipment

Transshipment traffic is designated by transfer of goods from a sea-going vessel to another sea-going vessel before the place of final destination has been reached. Special attention is made such that for port traffic, transshipment traffic is counted once, while for port/berth throughput, transshipment throughput is counted twice.

The standard practice for the transshipment containers is that each movement is counted, so where necessary, the figure for transshipment container published by the port has been adjusted, either by doubling the figure recorded for the inbound part of the movement or by using additional information.

Factors affecting transshipment

1. Restrictions of port facilities: due to lack of large/adequate berthing facilities and draft limitations
2. Tariff structure: cheaper tariffs/reduce tariffs
3. Efficiency in port services
4. External environment: route changes by shipping lines
5. Economies of scale and trading pattern of each country: can answer “whether the service is direct or a feeder operating via hub-ports”.
 - a. Tendency for export-oriented economy to be more served by feeder services than direct services
6. Congestion
7. Shipping lines policies

Direct services among others depend on the volume of trade to and from import and exporting countries or region.

Transit

Transit traffic is goods or cargo coming into the country (and thus not originating or destined into the country) which is dispatched either by road, rail or inland waterway. Special attention has to be made such that, if coming cargo not destined into the country is dispatched at the port by coaster or sea going vessel, the mode of activity becomes transshipment. Though en route, the cargo is categorized as transshipment and not transit traffic. This view is different from customs point of view that would visualize or consider any cargo coming into the country but not destined to that country (i.e. en route), even though dispatched by coaster or sea going vessels as transit. The customs definition is not based on the mode of dispatch. With port authorities, goods en route and dispatched by coaster or sea going vessel are counted as transshipment.

Standard Minimal for Compiling Port Statistics (Formats)

The main objective of ports compiling statistics on cargo throughput is to gather data on trade flows through the ports in order to obtain the most precise description of the overseas trade. Collection of data on proposed formats can be considerable can be a reasonable initial step data in harmonized data.

(1). *Throughput by Cargo Type*

Volumes through the port can be related to economic activity irrespective of the type of cargo, or related to port facilities or terminals, in which case the cargo type is the determining factor. Port volumes are classified into the following four main categories, depending on the handling equipment required.

1. Break-bulk (general or conventional)
2. Containers
3. Dry bulk
4. Liquid bulk

Collection of data on these categories can be considered as a reasonable initial step for recording in a harmonized format shown below.

Throughput by cargo type

	Year XX	
	Discharged	Loaded
General Cargo/ Conventional/ Break-bulk		
Containerized		
Dry bulk		
Liquid bulk		
TOTAL		
Of which transit		
Of which transshipped		

Break-bulk cargo:

Include non-containerized general cargo stored in boxes, bales, pallets, pre-slung, big bags, nets, or other units to be loaded onto or discharged from ships or other forms of transportation. Examples include iron, steel, machinery, linerboard and wood pulp.

Container:

Is a box made of aluminum, steel or fiberglass used to transport cargo by ship, rail, truck or barge. Common dimensions are 20' x 8' x 8' (called a TEU or twenty-foot equivalent unit) or 40' x 8' x 8' (forty-foot). Variations are collapsible containers, tank containers (for liquids) and "rag tops" (open-topped containers covered by a tarpaulin for cargo that sticks above the top of a closed box).

Dry Bulk:

Include minerals or grains stored in loose piles moving without mark or count (e.g. ores, coal, cereals and fertilizers). These low-density products are transported in bulk-carriers of various ranges. Handling of export products is mainly operated with conveyers. Ship to shore operations of import products requires cranes and hoppers. On the apron, small cargoes are generally loaded in trailers while large cargoes are carried through conveyor belts to warehouses or silos.

Liquid Bulk:

Cargo includes petroleum products, molasses, and vegetable oil, which is transported by liquid bulk carriers. The unloading is by pumps provided by ship and port. Unloading performance depends on the size of the ship, viscosity, temperature, and safety regulation for hazardous products.

(2). Containerized traffic

Although, in an apparent simplicity, there are numerous problems linked to different conventions, focus and characteristics of the containerized trade. The most striking example of difficulties on convention concerns transshipment traffic, which is counted once by some ports, or twice by others. Also on focus is the absence of information on tonnage on containers in some ports. One example on characteristics of containerized trade is the fact that if there is no distinction between empty and full containers, any imbalance in the containerized trade is hidden.

Collection of data can be recorded in different or combined tables for tonnages or TEUs as shown below.

Containerized cargo (different or combined tables for tonnage or TEUs)

		Year XX
Discharged	Full	
	Empty	
Loaded	Full	
	Empty	
Transshipment	Full	
	Empty	

Only “net weights” of containers that are measures of weight of cargo are recorded. The tare weight of the container is excluded.

“Full” means the container contains cargo. This does not mean the container has been filled to its weight or cubic capacity. Almost always, transshipment containers are full load containers.

“Empty” containers are containers which are moving without any freight paying cargo.

For port traffic, transshipment traffic is counted once, while for berth/port throughput, transshipment throughput is counted twice.

(3). Transit Traffic

Transit traffic is goods received in a port en route and from which they have to be transferred and dispatched to their ultimate foreign destination by road, rail, or inland waterway.

Collection of data for transit traffic can be recorded in different or combined tables for tonnages and TEUs (for containers) as shown below.

Transit traffic (tonnages and TEUs)

		Year XX
Discharged going to	Country A	
	Country B	
	Country C	
Loaded coming from	Country A	
	Country B	
	Country C	

As shown in the table, transit traffic is also recorded by country of destination for cargo discharged (i.e. inward cargo) and country of origin for cargo loaded (i.e. outward cargo).

Chapter 3: Performance Indicators, Conventions and Definitions

The manual aims to introduce a standardized view and computation of ports performance indicators, which takes into the account the UNCTAD manual on a uniform system of ports statistics and performance indicators and international standard practices that meet the current needs. The ultimate goal is to enhance the knowledge and information on performance indicators among PMAESA members, and use the information to increase ports operational efficiency and how as a group PMAESA ports can benchmark for comparison with other ports in the world.

Ports performance indicators can roughly be classified into four types:

1. Service indicators: time spent by a ship in port, time spent by cargo in port, etc...
2. Output indicators: traffic and throughput indicators
3. Utilization indicators: berth occupancy
4. Productivity indicators: productivity in port, productivity at berth, crane productivity etc.

A few types and major performance indicators in the above categories are given below.

Service indicators

Time is a major indicator for service indicators. There is need to consider separately the service time for ship and service time for cargo.

Ship Related

The service indicators are useful for the ship-owners and shippers because the time the ships spend in port is paid by the ship owner and also by the shipper. In addition, charter ships have to pay for the demurrage, though some costs are recovered through surcharges imposed on shippers (e.g. Vessel Delay Surcharge – VDS). The service indicators show the quality and extent of services provided by the port. Main service indicators are:

- Total port time (ship turn-round time)
- Waiting time: working period (operating time at berth) and non- working periods
- Time at berth

Port time (ship turn-round time)

The time in port (turn-round time) is the time the ship spends in the port from arrival in front of the port up to the departure after leaving the limits of the port. The total time in port is inclusive of all the steps of a life of a ship in a port.

$$\text{Port time} = \text{Waiting time} + \text{Service time}$$

Average port time = (cumulative time for waiting + service time)/total number of ships

Waiting time

Waiting time is the cumulative time spent by all ships in the port waiting for berth, documents, pilot, tug, bad weather, availability of cargo, gang, beginning and change of shift etc. The waiting time can be considered as the waiting time IN and waiting time OUT, and further classified by causes onto ship side and port side:

- Ship's convenience (ship side) e.g.
 - Non availability of cargo
 - Technical problems aboard the ship
 - Bad weather conditions
 - Waiting for high tide sufficient for berthing or entering or leaving the harbour

Port convenience (port side) e.g.

- Traffic congestion
- Non-availability of berths
- Accident in the channel
- Regulation

Waiting time = cumulative time spent by all ships for waiting time IN + waiting time OUT

Service time

Service time includes the pre and post berthing time, i.e. the time pilot is on board and the berth time.

Service time cannot be equated to berth time because there are some services undertaken before and after berthing of the ship (e.g. pilot and tug services in port).

Literally,

Service time = port time – waiting time

Berth time

Berth time is the first-to-last time that a ship is at berth. It is the period of time during which a ship is berthed in a port, including working and non-working periods.

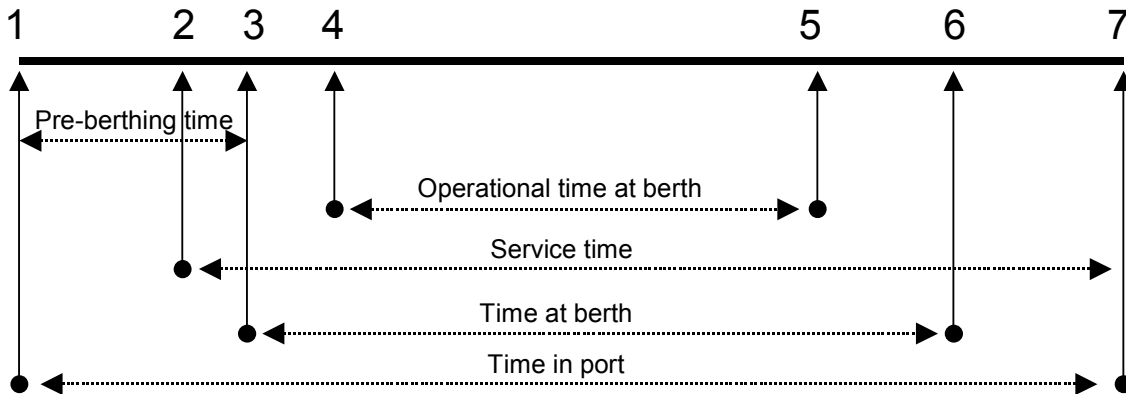
Berth time = Berthing time – deberthing time

Source of data

Data for the ships hour in port is provided by the office of the Harbour Master, which registers the date, hour and minute of arrival of ships to where the pilot is awaiting, the date and time when the ship leaves the berth, the type and size of the ships, the time of the nautical operations, and the name of the berth that ship is berthed.

Ship hour in port

A graphical presentation of the ship hour in port from the UNCTAD manual for port statistics summarizes the ship hour in port as given below.



Number	Event
1	Arrival at port (outer anchorage for instance)
2	Pilot on board
3	Ship at berth (end of mooring for instance)
4	Start of operations
5	End of operations
6	Departure from berth
7	Departure from the port (pilot dropped for instance)

Whereby,

- Ship's time in port (or ship turn-round time) = $7 - 1$
- Service time = $7 - 2$
- Time at berth = $6 - 3$
- Operating time at berth = $5 - 4$

Factors influencing service indicators

1. Topographical and geographical factors
 - Port estuary (affect access)
 - Tide time
 - Weather

2. Operational

- Port congestion, unavailability of berths
- Priorities of other ships
- Unavailability of pilots or tug

Cargo related:

The main indicator recorded is dwell-time for containerized cargo. Cargo dwell time is the duration cargo remains in the port before being loaded on board or collected for domestic or transit distribution. It is the time cargo remains in a terminal's in-transit storage area while awaiting shipment or collection by clearance transportation.

Container dwell time = Days/Container (monthly and annually), measured for:

- Import full, export full and empties
- Average(overall)
- Total imports, exports and empties dwell time per country

Proposed standard minimal indicators

Ship related:

Minimal set advisable is:

- Total Port Time
- Total Berth Time
- Pre-berthing delays

The information should be available per terminal, and preferably on a monthly basis.

Cargo related:

The minimal advisable set is average container dwell time according to nature of the traffic (import, export, transit). For transit, separation of dwell time by country is necessary to compare and minimize disparities.

Output indicators

Output indicators include:

- Throughput handled in the port or in a berth: berth output
- Handling output: ship output and gang output

Berth output/berth throughput

Berth output measures the total tonnage or units of cargo handled at berth in a stated period of time (usually a year). Formula for berth throughput indicator depends on the type of cargoes:

- General cargo berth indicator = total tons/1 year on the berth concerned

- Containers berth indicator = total TEU/1 year on the berth concerned
- Ro-Ro berth indicator = total vehicles or rolls/1 year on the berth concerned
- Bulk berth indicator = total tons/1 year on the berth concerned

Source of data

The time sheets filled in by the handling supervisors

Ship output

Ship output measures the rate at which cargo is handled to and from a vessel in port or at a berth. They are indicators on how good the cargo handling operations are. Three ship output indicators are:

- Tons per ship hour in port = tons/ship hours in port=tons/ship/hour in port
- Tons per ship hour at berth = tons/ship hours at berth=tons/ship/hour at berth
- Tons per ship worked hour = tons/ship worked hours=tons/ship/worked hour

Ship working output indicates how much the ship is handling in one hour. For container or vehicle handling, the tonnage handled (i.e. tons) is replaced with total number of TEU or boxes i.e. TEU/ship hours.

Source of data

The time sheets filled in by the handling supervisors

Gang output

Gang output indicator is the average tons of cargo handled within a stated period. It indicates the amount of tons the gang can handle in say one hour (20 tons per gang per hour). The following ratios measure the gang output:

Average output per gang hour = tonnage handled/(gang x hours worked)

For containers:

Average output per gang hour = total TEU (or boxes) handled/(gang x hours worked)

Source of data

The time sheets filled in by the handling supervisors

Proposed standard minimal indicators

Suggested indicators are:

- Berth throughput= total tons/1 year on the berth concerned
- Tons per ship hour in port = tons/ship hours in port=tons/ship/hour in port
- Tons per ship hour at berth = tons/ship hours at berth=tons/ship/hour at berth

- Average output per gang hour = $\text{tonnage handled} / (\text{gang} \times \text{hours worked})$
- Average output per gang hour = $\text{total TEU (or boxes) handled} / (\text{gang} \times \text{hours worked})$

Factors influencing output indicators

1. Type of cargoes and packages –non unitized cargo (cases, bags and logs), unitized cargo pre-sung (bags, pallets, containers etc.)
2. The cargo mix of the small consignments
3. The shipload tonnage handled
4. The type and age of the ships (conventional, multipurpose, mixture, ro-ro, containership etc.)
5. The route inside the port (direct or indirect delivery)
6. The equipment (port or ship equipment), cranes, conveyor belts or hands)
7. Location of goods inside the holds (specifically for bulk)

Utilization indicators

Utilization indicators are measures of how intensively port facilities and resources are used. Indicators monitor the effective use of the port assets, such as terminals (or berths), handling equipment, etc... Among the most important are given below.

Utilization of berth

- Berth occupancy = $\text{yearly working hours} / 365 \times 24 \text{ hours}$
- Idle time ratio = $\text{total cumulated annual idle time in hours} / \text{annual working hours}$

Utilization indicators can also be worked for the yards, sheds and handling equipment utilization.

Berth occupancy

Berth occupancy gives an indication of the intensity of use of the berths. There is a relation between the berth occupancy and the average waiting time before the berth becomes available for a ship.

Low berth occupancy denotes under utilization of assets, but waiting time is negligible and the level of service is high, while a higher rate may lead to congestion.

However, it is risky to take decisions based on the berth occupancy

- A high ratio may be a positive element if ships may stay berthed when they wish so, and pay the corresponding port dues while not inducing waiting time for other vessels, or negative element if the vessels induce a ship queuing phenomena
- A cut of the occupancy ratio may result from a good management which is positive (e.g. by reducing delays at berth or investing on efficient handling equipments), or a management which may induce ships diverting their calls

Rated terminal capacity

The design capacity of a terminal is based on a number of assumptions taking into account several parameters. The ratio between the total throughput of a terminal and its rated capacity is a key indicator for effective planning of the development of new additional capacity.

Utilization of equipment (or yards and sheds)

For each type of equipment the ratio is calculated to know their availability and their use.

Availability ratio = annual hours of availability/365x24 hours

Rate of utilization = annual worked hours/365x24 hours

Source of data

Information is provided from the time sheets. Some difficulties exist in collecting this information:

- If the port authority is operating the port, it is easy to get the time sheets.
- If independent operators or stevedores perform the handling, the port authority has difficulties to be provided with the documents (less solved by strong agreement/contract between the port authority and terminal operators).
- Other difficulties arise from the operators not indicating the effective reasons of idle time to avoid showing the weakness of their work organization.

Proposed standard minimal indicators

The proposed indicators are:

- Berth occupancy (at berth or terminal level), on a monthly and annual basis
- Ratio between throughput of a terminal and its rated capacity

Productivity Indicators

Productivity is the measurement of the volume handled per unit of time. It is the choice of volumes (numerator) and amount of time used (denominator) that differs in ports. The usual productivity indicators are the following:

Ship productivity

- Ship productivity, the divider (denominator) is the duration of the call in the port, which is usually either the total turn-round time (port time), time at berth or ship working time.

In port: Ship productivity (gross) = total moves/port time

At berth: Ship productivity (gross) = total moves/berth time

Working: $\text{Ship productivity (gross)} = \text{total moves/working time}$

Crane productivity

- Crane productivity, the divider is the number of gross or net crane hours. Net crane hours is gross crane hours less delays crane hours

$\text{Crane productivity (gross)} = \text{total moves/crane hours}$

$\text{Crane productivity (net)} = \text{total moves/net crane hours}$

Proposed standard minimal indicators

Suggested indicators are:

- $\text{Ship productivity (gross)} = \text{total moves/port time}$
- $\text{Ship productivity (gross)} = \text{total moves/berth time}$
- $\text{Crane productivity (gross)} = \text{total moves/crane hours}$

Movements (moves). What is a move?

Not all ports agree on similar way of counting movements. Movements or moves are applicable only on containerized cargo. Movement types include:

- Unloaded/discharged containers (import, inbound transit, unloaded from transshipment). The unloading of each container is considered as 1 move.
- Loaded containers (export, outbound transit, transshipment containers reloaded). Loading of each container is considered as 1 move.
- Shifting on board is counted as 1 movement
- Restow/ landed and reshipped (which is the shifting via quay) is counted for 2 movements
- Hatch cover opening and closing is counted as 2 movements

Containers, whether 20', 40' or out of gauge container (OGC) are considered as units and counted as 1 move each. However, for commercial, billing or monitoring of Vessel Delay Charges, an OGC could be considered to have more than one move.

The use of TEU instead of physical boxes is mainly linked to marketing purposes, as it artificially increases the crane productivity, and cannot be considered as a measurement of productivity.

The total number of moves should include all types of movements. All types of moves should also be defined (i.e. give conventions or principle used).

Efficiency and costs

The combination of the use of the resources and costs is important. You need information on costs to combine it with the operating data. Cost data required include:

- Berth labour costs
- Equipment maintenance costs

- Fuel costs
- Berth overheads (administration, capital costs of sheds and equipment)

The most important measures at berth are:

- Total cost/ton of cargo handled

Labour cost/ton

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Unit 16

CARGO-HANDLING EQUIPMENT ON BOARD AND IN PORT

Basic terms

<i>cargo-handling equipment</i> <i>cargo gear</i> <i>handling facilities</i> <i>lifting gear</i> <i>conveyor belt</i> <i>elevator</i> <i>pumping equipment</i> <i>derrick</i> <i>fork lift truck</i> <i>mobile crane</i> <i>straddle carrier</i> <i>tractor</i> <i>tug-master</i>	<i>front/side loader</i> <i>van carrier</i> <i>transtainer</i> <i>container crane / portainer</i> <i>transit shed</i> <i>warehouse</i> <i>cranes:</i> <i>dockside crane,</i> <i>quay crane,</i> <i>container crane</i> <i>gantry crane,</i> <i>deck crane</i> <i>(ship's) cargo gear</i>
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The form of cargo-handling equipment employed is basically determined by the nature of the actual cargo and the type of packing used. The subject of handling facilities raises the important question of mechanization.

BULK CARGO HANDLING EQUIPMENT

So far as **dry bulk cargoes** are concerned, handling facilities may be in the form of power-propelled conveyor belts, usually fed at the landward end by a hopper (a very large container on legs) or grabs, which may be magnetic for handling ores, fixed to a high capacity travelling crane or travelling gantries. These gantries move not only parallel to the quay, but also run back for considerable distances, and so cover a large stacking area, and are able to plumb the ship's hold. These two types of equipment are suitable for handling coal and ores. In the case of bulk sugar or when the grab is also used, the sugar would be discharged into a hopper, feeding by gravity a railway wagon or road vehicle below.

Elevators (US) or silos are normally associated with grain. They may be operated by pneumatic suction which sucks the grain out of the ship's hold.



SHIP UNLOADERS



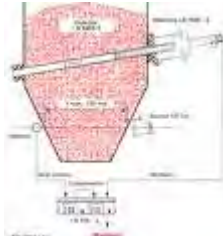
FRONT LOADER



BELT CONVEYOR



HOPPER



HOPPER



SILO / ELEVATOR



GRAB TYPE UNLOADERS



LOADING BOOM

LIQUID CARGO HANDLING EQUIPMENT

The movement of **liquid bulk cargo**, crude oil and derivatives, from the tanker is undertaken by means of pipelines connected to the shore-based storage tanks. Pumping equipment is provided in the tanker storage plant or refinery ashore, but not on the quayside. In view of the dangerous nature of such cargo, it is common practice to build the special berths a small distance from the main dock system on the seaward side. Oil cargo is discharged from the ship's tanks, via the cargo piping system to the main ship's manifold usually situated amidships, on either port or starboard side. From there by means of shore-based loading arms oil is transferred to the shore manifold and is then distributed to shore-based storage tanks on the oil terminal. The loading arm hose must be flanged oil-tight to the ship's manifold so that oil spills can be avoided.



TERMINAL MANIFOLD



SHIP'S MANIFOLD



LOADING ARMS

GENERAL CARGO HANDLING EQUIPMENT

With regard to **general cargo** (goods, merchandise, commodities), also referred to as break bulk cargo, almost 90 percent of all such cargo in most liner cargo trades today is containerized. Meanwhile the system of dockers handling cargo will continue, but doubtless every effort will be made to expand the already extensive use of various types of mechanized cargo-handling equipment.

General cargo is handled by cranes on the quay, floating cranes or by the ship's own cargo gear (deck cranes, derricks, etc.). Attached to such lifting gear is a shackle which links the crane or derrick with the form of cargo-handling equipment being used. For most lifts a hook is used.

There are numerous types of tools or **loose gear** that can be attached to the shipboard or shore-based lifting gear. They include the sling or strop, which is probably the most common form of loose gear. Such equipment, generally made of rope, is ideal for hoisting strong packages, such as wooden cases or bagged cargo, which is not likely to sag or be damaged when raised. Similarly, snotters

or canvas slings are suitable for bagged cargo. Chain slings, however, are used for heavy slender cargoes, such as timber or steel rails. Can or barrel hooks are suitable for hoisting barrels or drums. Cargo nets are suitable for mail bags and similar cargoes that are not liable to be crushed when hoisted. Heavy lifting beams are suitable for heavy and long articles such as locomotives, boilers or railway passenger coaches. Cargo trays and pallets, the latter being wooden or of steel construction, are ideal for cargo of moderate dimensions, which can be conveniently stacked, such as cartons, bags, or small wooden crates or cases.



CONTAINER FITTINGS



CHAIN SLING



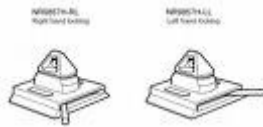
TWISTLOCK



CONTAINER FITTINGS AND LASHING



CORNER CASTING



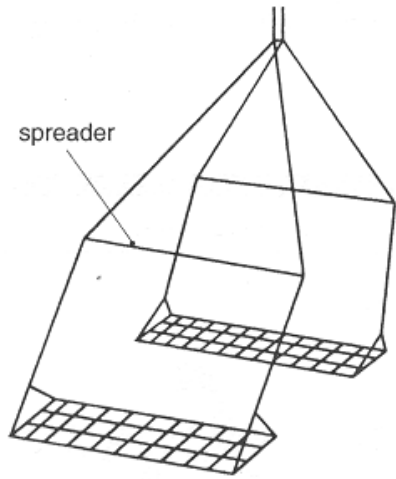
CARGO NET



HOOKS



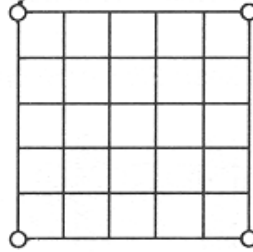
LIFTING BEAM



up to 9'0" by 4'6"

Vehicle Sling

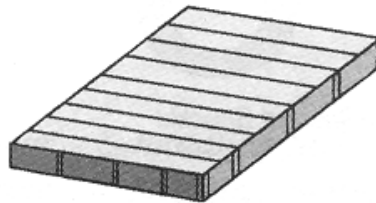
Eye for
Lifting Gear



Cargo Net



Canvas Sling



Pallet

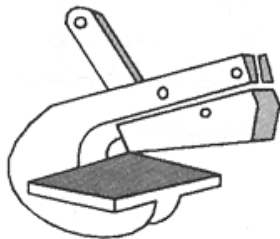
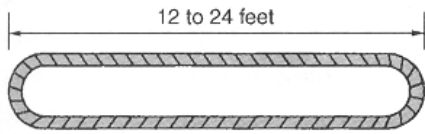
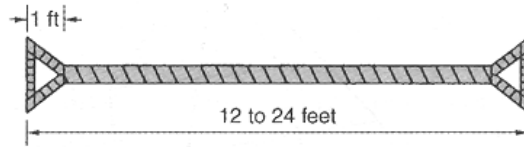


Plate Lifting Clamp

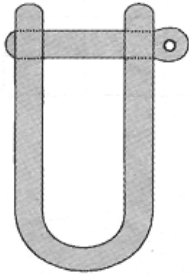
Cargo Handling Equipment or Lifting Gear (loose gear & cargo tools)



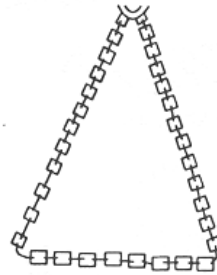
Loose Gear: *Sling or Strop*



Snotter



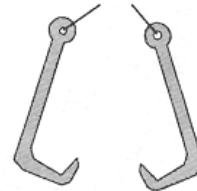
U-Shaped Shackle



Chain Sling



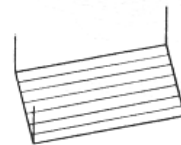
Hooks: *Timber hooks*



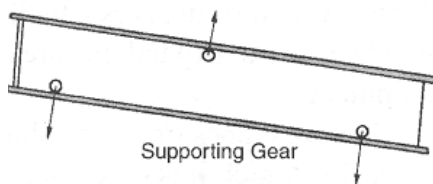
Hooks: *Box hooks*



Hooks: *Can hooks*



Cargo Tray



Heavy Lifting Beam: *Lifting Gear*

TYPES OF PACKING AND LIFTING EQUIPMENT/GEAR



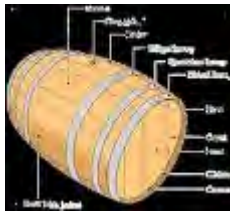
WIRE SLING



DRUM/BARREL



KEG



CASKS



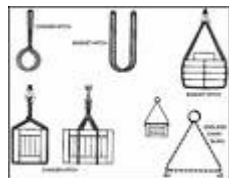
CARGO HOOKS



CRATES



BOX / CASE



CARGO SLINGS



BOX HOOK



PLATE CLAMP



PALLET

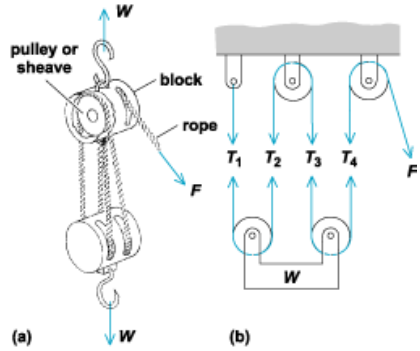


LIFTING GEAR

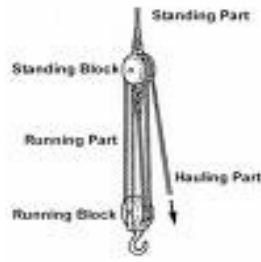


MODERN CARGO HANDLING

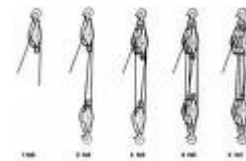
BLOCK AND TACKLE SYSTEMS



(a) TACKLE: BLOCK AND SHEAVE



TACKLE



LIFTING GEAR

Additionally, dog or case hooks and case and plate clamps are suitable for transshipping cargo to railway wagons or road vehicles, but not to or from the ship, except to facilitate trans-shipping the cargo in the hold to enable suitable cargo-handling gear to be attached. Plate clamps are used for lifting metal plates. Dockers working in the ship's holds also use pinch or crowbars for moving heavy packages, and band books for manoeuvring packages into position.

PORT/TERMINAL CARGO HANDLING EQUIPMENT

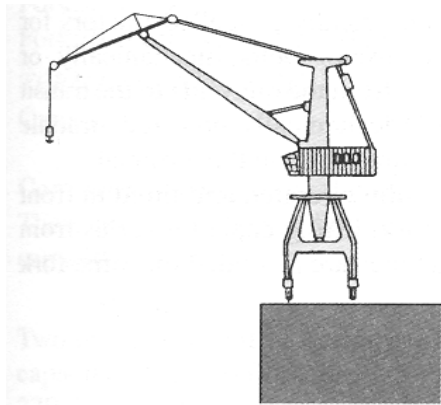
A lot of terminal or port **cargo handling equipment** is provided to facilitate movement of the cargo to and from the ship's side and the transit shed, warehouse, barge, railway wagon or road vehicle. These include two-wheeled hand barrows and four-wheeled trucks either manually or mechanically propelled, and mechanically or electrically propelled tractors for hauling four-wheeled trailers. Ro-ro trailers are moved by tug-masters or ro-ro tractors. There are also belt conveyors mechanically or electrically operated, or rollers, all perhaps extending from the quayside to the transit shed, warehouse, railway wagon or road vehicle. Containers are loaded and unloaded by means of the quayside container cranes, i.e. container gantries also called shiptainers.

Transtainers or stacking cranes, straddle carriers, van carriers, front and side loading fork-lift trucks are used for moving and stacking containers within the terminal up to five-high, i.e. five containers one above the other. Mechanically powered straddle carriers are designed to distribute containers on the quay and on the terminal.

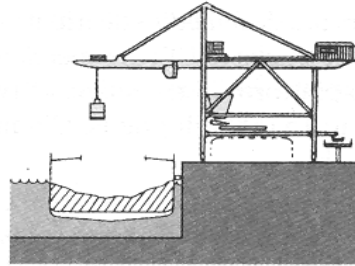
Fork lift trucks (FLT) are mechanically or electrically operated and fitted in front with a platform in the shape of two prongs of a fork; lifting capacity varies from 1 to 45 tons. Clamps for reels and bales are provided on some fork lift trucks.

On the docks various types of dockside cranes, level-luffing cranes, mobile cranes etc. are used for moving and lifting packages. All the vertical cargo movements are conducted by the lifting gear (lift-on/lift-off equipment).

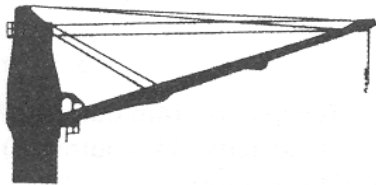
Roll-on/roll-off cargoes, i.e. containers and heavy loads on trailers, roll on and off the ro-ro ship via stern, bow or quarter ramps. They are lifted to various decks on board by means of scissor-supported platforms.



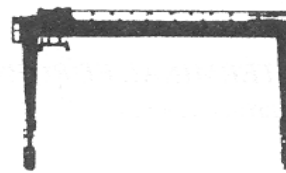
Level-Luffing Crane: *Docksider Crane*



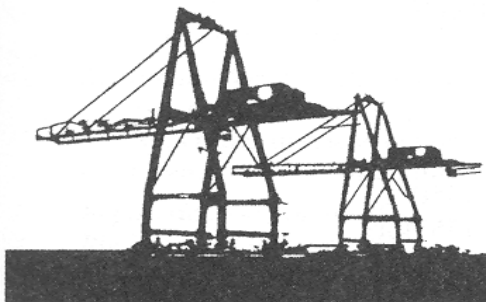
Ship Unloader Gantry



Shipboard Crane: *Deck Crane*



Transtainer Stacking Crane:
Straddle Carrier



Container Crane (*Portainer*)



For more port cargo handling equipment see also Supplement (End of Unit 16)!!!

**IMO STANDARD MARINE COMMUNICATION PHRASES
IV-C - CARGO AND CARGO HANDLING**

1.1.4 - Operating cargo handling equipment and hatches

Are cranes/derricks operational?

- Yes, cranes/derricks operational.*
- No, cranes/derricks not operational (yet).*
- Cranes/derricks operational in ... minutes.*

Rig derrick(s)/crane(s) of no. ... hold.

Rig heavy lift derrick.

Shift derrick(s) of no. ... hold to ... side.

Check preventers.

Top derrick(s) over hatch/pier.

Lower derrick(s) over hatch/pier.

Swing derrick(s)/crane(s) outboard.

Keep safe working load of derrick(s)/crane(s).

Instruct winchman/craneman.

1.1.5 - Maintaining/repairing cargo handling equipment

Check hold(s)/hatch cover(s)/derrick(s) for damage and report.

- Cargo battens damaged.*
- Rubber seals of hatch cover(s) damaged.*
- (Container) lashings damaged.*

Are hold ventilators operational?

- Yes, hold ventilators operational.*
- No, hold ventilators not operational.*
- Hold ventilators operational in ... minutes.*

Are winch motors operational?

- Winch motor of no. ... derrick operational in ... minutes.*

Check repair of crane/winch / ... personally.

Lubricate blocks of crane(s)/derrick(s).

A Comprehension & vocabulary

A.1 *Fill in the appropriate term:*

- ***straddle carriers*** • ***container gantries*** • ***tug-masters***
- ***fork lift trucks*** • ***trailers***

The Auckland Container Terminal

The Auckland Container Terminal is equipped with three Paceco
1. _____ . The terminal equipment also includes 20 2. _____
to move and stack the containers on the terminal. 3. _____ and
4. _____ are used for moving containers into and off the ro-ro vessels.
For empty containers more than thirty 18-ton 5. _____ are used.

A.2 *State the kind of loose gear (see p. 119 - 120) you would use for handling the following types of cargo:*

1. steel plates _____
2. eggs in cartons _____
3. barrels or drums _____
4. heavy machinery _____
5. raw oil _____
6. iron ore _____
7. steel rails _____

- 8. bagged cargo
- 9. containers

A.3 Classify the following terms under the four headings as appropriate:

- *ship unloader* • *transtainer* • *dockside crane* • *straddle carrier*
- *mobile crane* • *FLT* • *hopper* • *floating crane* • *bucket elevator*
- *conveyor belt* • *deck crane* • *derrick* • *pumping equipment*
- *tug-master* • *level-luffing crane* • *trailer* • *pneumatic unloader*
- *grab unloader* • *loading arm*

conventional or general cargo	containers and ro-ro units	bulk cargo	liquid cargo

A.4 State which of the following sentences are true or false:

1. Hand books are used with bagged-cargo.
2. Conveyor belts move bulk cargoes.
3. Transtainers are quay container cranes.
4. Straddle carriers are used to load containers on board ship.
5. Tug-masters move co-co cargo info co-co ships.
6. Chain slings are used with lightweight cargo.
7. Cargo nets are suitable for cartons and bags.
8. Fork lift trucks are not used to handle paper rolls.
9. Drums are stowed onto the pallet to facilitate handling.

TRUE	FALSE

A.5 Complete me text below with the appropriate words:

- *boom* • *officers and crew* • *cargo handling* • *ship's gear*
- *lifting gear* • *cargo handling equipment* • *dockers* • *winch*

Handling General Cargo in the US

General cargo used to be handled in the United States chiefly by means of 1. _____ . Today the greatest proportion of general merchandise is carried in containers and worked with the terminal 2. _____ . The speed loading and discharging and the adequacy of stowage is highly dependent upon

the skill and experience of 3. _____ and the ship's 4. _____. However, these must be quite familiar with the methods of 5. _____. The term ship's gear is used to describe the ship's deck 6. _____, its cargo 7. _____ attached either to mast or kingposts. Shore 8. _____ is usually used for handling conventional general cargo in most European ports.

A.6 For each group of crane types find the type of cargo they handle: dry bulk cargo, containers, or general cargo

CRANE TYPES	CARGO TYPES
dockside crane	
gantry crane	
level-luffing crane	
overhead crane	
ship crane	
derrick	
floating crane	
slewing crane	
portal crane	
semi-portal crane	
quayside crane	
mobile crane	
jumbo (Scotch) derrick	
shiploader	
ship unloader	
stockyard crane	
stacking gantry	
portainer	
container gantry	
transtainer	
shiptainer	
straddle carrier	
front loader	
side loader	

A.7 Underline the cargo-handling equipment in the description of the Amsterdam Westhaven bulk cargo terminal:

The terminal has a quay of 800 m in length and 15 m in depth. Maximum draught of vessels to be accommodated is 13.5 m. Maximum outreach of loading/discharging equipment over water is 45 m. Four gantry cranes, lifting capacity 3 x 30 tons and 1 x 50 tons, are used for handling ore and coal. The material is transported to storage by a conveyor belt system. Grab bridge cranes are used for ore and floating cranes are also available.

A.8 Port of Cork Container Services

Our Services

The Port of Cork offers a wide choice of fast, scheduled lift-on lift-off and roll-on roll-off services to continental Europe. The Port offers a scheduled ro-ro shortsea service to Swansea and Cork is the only Irish port providing a deepsea ro-ro service to Scandinavia, and the Mediterranean, and West Africa. At both the Tivoli Container Terminal and the Ringaskiddy Ro-Ro Terminal, modern port facilities and cargo handling equipment, high productivity levels, competitive pricing and twenty four hour working, seven days per week have contributed greatly to increased utilised throughput.

Lift – on Lift – Off Services

The Tivoli Container Terminal is situated 2 miles / 3 kilometres downriver from Cork city at the junction of two of Ireland's four Euroroutes, the N8 Cork – Dublin and the N25 Cork – Waterford – Rosslare. The terminal is adjacent to the Lee Tunnel and enjoys ready access to the N20 Cork-Limerick- Galway primary route.

Handling equipment includes two modern gantry container cranes and six straddle carriers. The terminal is equipped with a bank of reefer/heater points. The approach channel to Tivoli has been dredged to a depth of 6.5m C.D. to allow fully laden 700/800 teu vessels to access or depart the Terminal at all stages of the tide.

Competitive high frequency sailings have led to increased containerised throughput, thus enabling the Port of Cork to increase its market share of the Irish container market. The wide range of door to door services permit fast and frequent delivery of containers throughout Europe while feeder services allow Irish exporters to service deepsea markets speedily and efficiently.

Modern facilities are available at both Ringaskiddy and Tivoli to cater for the port's increasingly important roll-on roll-off traffic. The Ringaskiddy Ferry Terminal accommodates car ferry services to Britain and continental Europe together with regular shipments of trade vehicles.

The Grimaldi Euro-Med service is Ireland's only deepsea ro-ro service offering weekly connections to Scandinavian and Mediterranean ports. It is operated from the Ringaskiddy Deepwater Terminal which also services the port's considerable trade in deepsea trade vehicles. The Grimaldi West Africa service also calls to the Ringaskiddy Deepwater Terminal on a regular basis. Much of Cork's traffic in trade vehicles is handled at the Tivoli Ro-Ro terminal where regular shipments are discharged from British and mainland European ports. Extensive vehicle storage compounds are situated at Ringaskiddy and Tivoli.

There are four distinct public port facilities situated at the City Quays, the Tivoli Industrial and Dock Estate, the Ringaskiddy Deepwater and Ferry Terminals and the Cobh Cruise Terminal. For centuries the City Quays have handled most of the trade of the port and, while much of that traffic has now moved downriver, this area continues to account for approximately 1 million tonnes of cargo ranging from cereals, animal feedstuffs, fertilisers and coal to timber, acids and salt. In addition, a small number of medium size cruise ships continue to call to the City Quays.

The Port's lift-on lift-off container traffic – door – to – door and feeder – is handled at the Tivoli Container Terminal from where at least ten sailings per week are operated to European ports. Much of the Port's trade in trade vehicles is handled at this location as is the entire output of zinc and lead concentrates from the Lisheen Mine situated in County Tipperary. Other traffic handled at Tivoli includes refined oils, chemicals, LPG, salt, magnesite and livestock.

With a minimum depth alongside of 13.4 metres at low water, the Ringaskiddy Deepwater Terminal handles fully laden Panamax size vessels (60,000 tons deadweight), the only public port facility capable of so doing in any part of Ireland, north or south. Most of the Port's considerable trade in animal feedstuffs is discharged here where there is large – scale private sector investment in specialist warehousing. It is here also that Grimaldi Euro-Med Line's weekly roll-on roll-off service to and from the Mediterranean and Northern Europe is handled. In addition, the Deepwater Terminal handles other dry bulk cargoes, such as molasses, cement and steel scrap. Trade vehicles are discharged at both the Deepwater Terminal and the adjoining Ringaskiddy Ferry Terminal where Swansea Cork Ferries' service to Swansea and Brittany Ferries' service to Roscoff are accommodated. The Terminal's excellent passenger and freight facilities ensure smooth and efficient movement of passengers and freight through the port and onwards to their ultimate destinations – so important for the economic welfare of the region.

The Cobh Cruise Terminal is the only dedicated cruise terminal in Ireland. Situated within a few hundred metres of the centre of the picturesque town of Cobh, it is capable of accommodating cruise ships up to 320 metres in overall length.

B. Grammar

B.1 Supply the right form of the verb in brackets into the right place in the sentence:

Loading a Tanker

It now 15.00 hrs (*be*). The loading of cargo on time (*finish*). The personnel from the shore the loading arms (*disconnect*). Same deck hands the tank openings (*batten down*). They the valves (*close and seal*). Under the Bosun's control they various equipments such as dip stick, ullage tapes, sample cans and thermometers (*stow away*). The Chief Officer just his calculations of the quantity of oil loaded (*complete*). He already the draught marks (*check*), and now for shore officials to complete the cargo documents (*wait for*).

B.2 Supply the right article where necessary:

The Union Purchase

1. _____ union purchase or married-fall system is one of 2. _____ most commonly employed systems for 3. _____ both loading and 4. _____ unloading 5. _____ cargo with 6. _____ ship's gear. It is sometimes called 7. _____ union purchase system in 8. _____ UK or burtoning in 9. _____ US. 10. _____ two cargo booms and two winches are employed. One boom extends over 11. _____ hatch opening and 12. _____ other is swung out so that its peak is over 13. _____ quay apron or edge of 14. _____ pier. The ends of 15. _____ two falls are brought together and terminate in 16. _____ single book.

B.3 Rewrite the underlined phrases using the following adjectives:

• **likely** • **liable** • **subject** • **suitable** • **able**

1. Grab unloaders can plumb the whole width of the ship's hold.
2. Chain slings are used for handling heavy slender cargo.
3. Slings made of rope are used with the cargo which does not sag or get damaged when lifted.

4. Pinch or crowbars should not be used with cartons or with cargo which can be damaged by mechanical pressure.
5. Lightweight cargo can get crushed if overstowed by heavy packages.
6. A cargo of citrus fruit deteriorates easily if not carried under the appropriate temperature.

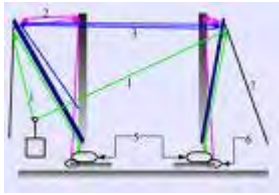
C. Writing skills

C.1 Answer the following questions:

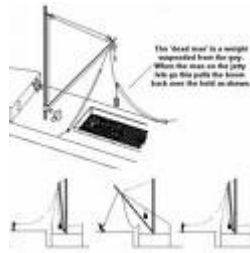
1. What is the cargo-handling equipment determined by?
2. What are bulk cargoes handled with?
3. How is oil moved on and off the ship?
4. What are the basic pieces of lifting gear for general cargo?
5. Which attachments are used with the lifting gear?
6. What are slings, books and lifting beams used for?
7. When do dockers use crowbars?
8. How are goods moved into and out of sheds, storages and warehouses?
9. What are fork lift trucks used for?
10. What equipment is used for handling containers and co-co trailers?

SUPPLEMENT: Port and Terminal Cargo Handling Equipment

SHIP'S GEAR



Union purchase (derrick)



Derrick work

TERMINAL EQUIPMENT



Fork-lift trucks

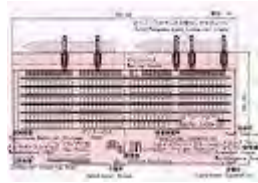


Mobile crane

CONTAINER TERMINALS



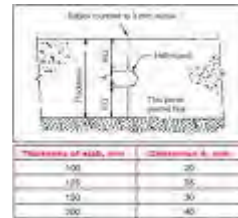
AUTOMATIC CONT. TERMINAL



FACILITIES AT CONT. TERMINAL



CONTAINER CRANES – PORTAINERS



STACKING AREA



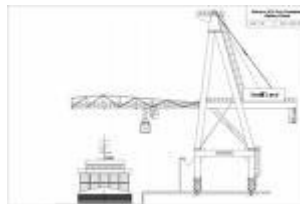
CONTAINER GANTRY



STACKING CRANE



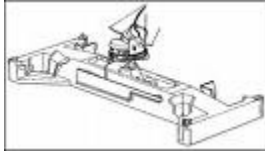
STRADDLE CARRIER



CONTAINER GANTRY (PORTAINER)



TRANSTAINERS



SPREADERS



VAN CARRIER



STRADDLE CARRIER



SIDE LOADERS

ROLL-ON/ROLL-OFF EQUIPMENT



TUGMASTER



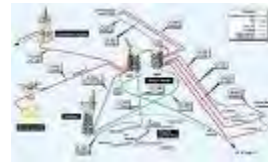
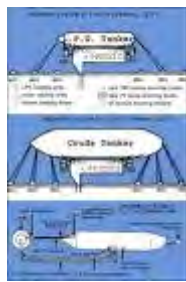
RO-RO TRAILER

BULK CARGO TERMINALS



BULK CARGO TERMINAL GRAIN TERMINAL CATERPILLAR/BULLDOZER

OIL TERMINALS



OIL TERMINAL

LNG & LPG TERMINALS

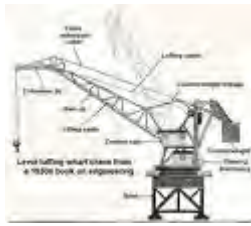


LPG TERMINAL

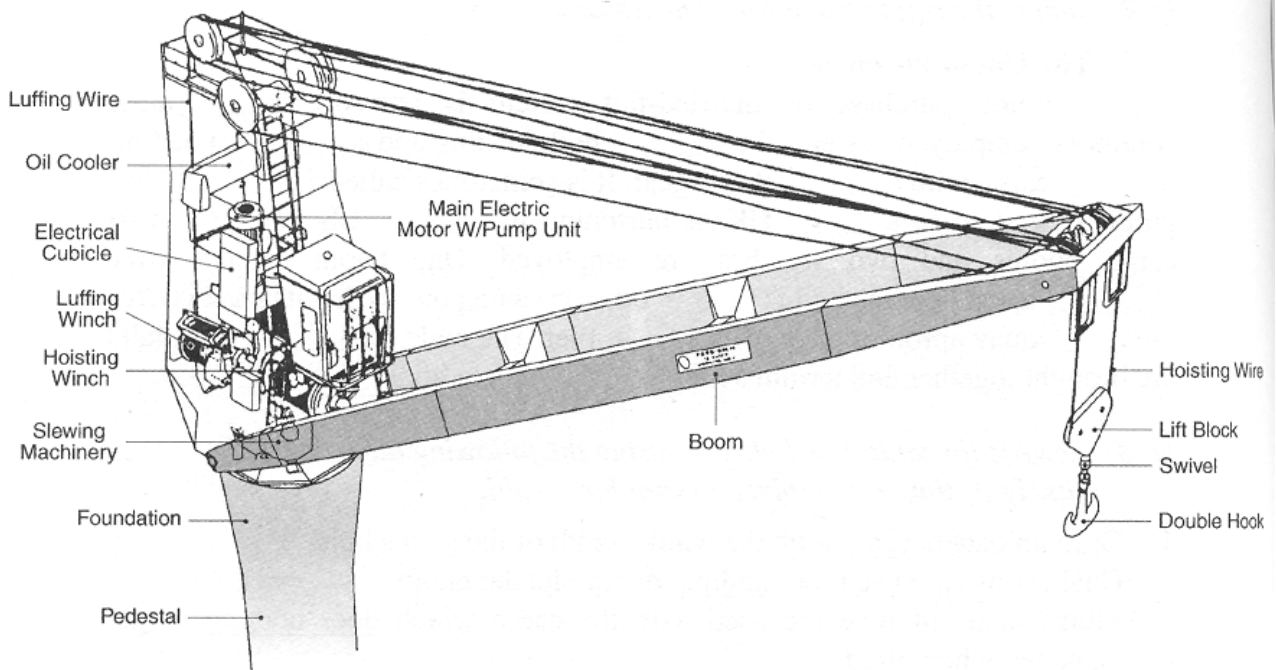


LNG TERMINAL



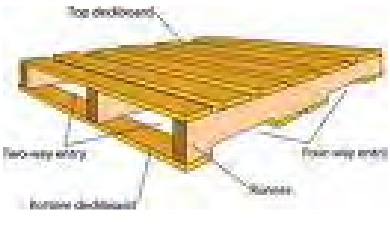




DOCKSIDE/QUAY/WHARF CRANES


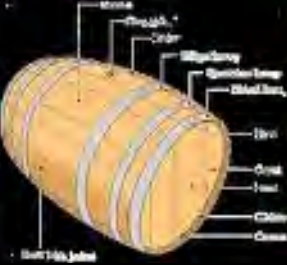


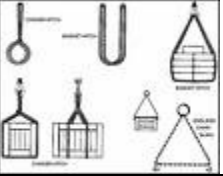



SHIP'S HEAVY MACHINERY

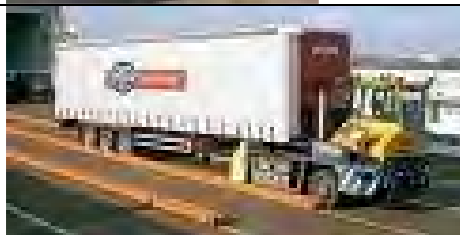
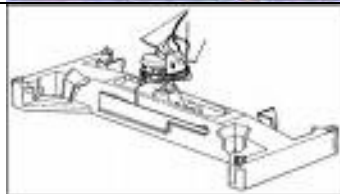




Supply the right term referring to the image in the left-hand column	
Equipment	Name
	
	
	
	
	

<p>(a) (b)</p>	
<p>The "dead end" is a weight suspended from the pulley where the rope on the jib goes the pulley the lower back over the top to return.</p>	



		
 <p>Level lifting what takes from a 10000 book of engineering</p>		
