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INFRASTRUCTURE, OPERATIONAL EFFICIENCY AND PORT PRODUCTIVITY MANAGEMENT IN PMAESA REGION

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CONTENTS

1. INTRODUCTION
2. ROLE OF SEAPORTS
3. PORT INFRASTRUCTURE
4. INVESTMENTS IN PORTS
5. PORT CAPACITIES
6. PORT OPERATIONAL EFFICIENCY
7. PORT PRODUCTIVITY
8. CHALLENGES FACING PORTS IN THE REGION
9. CONCLUSION


1. INTRODUCTION

Importance of Ports:

- Trade facilitation.
- Services to local, transit and transshipment traffic.
- Services to Shipping lines, Shippers and Consignees.
- Value adding activities.
- Employment opportunities.

2. ROLE OF SEAPORTS

- Provider of service for vessels, cargo and inland transport.
- Essential link in the international maritime transport chain.
- Gateways and nodes within international transport networks and serve corridors for materials and resources.

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- Major interface in the whole logistics chain.
 - Major generators of foreign exchange.
 - Prime mover of industrial and agricultural development.

3. PORT INFRASTRUCTURE

- Port entrance channels.
- Access to the port for inland transport e.g. roads, railways, etc.
- Quay walls and jetties.
- Port land excluding superstructure.

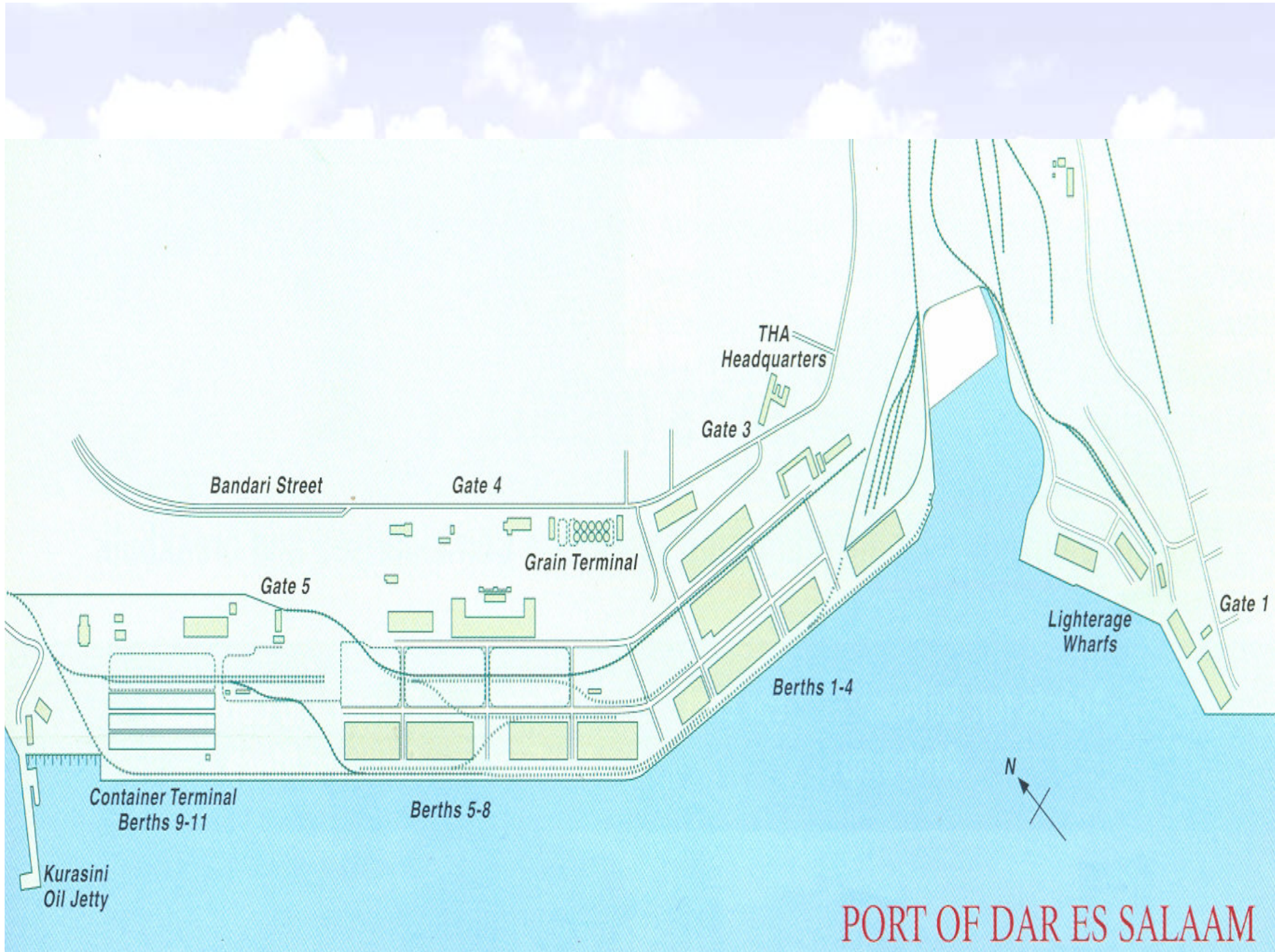
The background of the slide features a semi-transparent green overlay. On the left, a portion of a modern, multi-story control tower with a curved glass facade is visible. In the center and right, a large cargo ship is docked at a pier, with its deck filled with numerous yellow and red shipping containers. The sky above is bright blue with scattered white clouds.

Impact of increase in trade:

- Increase pressure on port capacity.
- Ports need deeper water drafts and longer berths.
- Demand for more investment in port infrastructure.

DAR ES SALAAM PORT





PORT OF DAR ES SALAAM

4. INVESTMENTS IN PORTS

4.1 Port potentials

- Large hinterland to serve. DSM port is serving six land-locked countries.
- Large consumer base. DSM port serves about 166 million people, with combined GDP of about USD 44 billion.
- Large shipping network destinations.

- Continued operational improvements measures, including private sector participation in offering port services.

- Trained workforce.

- Large road and railway networks to the hinterland. DSM port is served by two railway systems of different gauge:

TRC : 1.0 metres.

TAZARA: 1.067 metres.

Intrinsic capacities:

TRC – 2.5 million tons; utilization is about 30%.

TAZARA – 5 million tons; utilization is about 12%.

4.2 Future projections

- Cargo traffic volumes increase – demand for increase in handling capacity.
- Increase in ship calls and sizes – demand to the ports in terms of size and drafts at entrance channels, berths and equipment.

4.3 Private sector involvement

- Financing port projects.
- Port commercial activities.

5. PORT CAPACITIES

5.1 Create adequate port capacity ahead of demand.

5.2 Port expansion:

- Right amount and type of port equipment.
- Port area (Land).
- Dwell time as a critical factor.

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- The background of the slide features a semi-transparent yellow-green overlay on a photograph of a port. On the left, a modern, curved building with multiple levels of windows is visible. In the center, a large container ship is docked at a pier, with several yellow and red containers stacked on its deck. The ship is positioned in a body of water, with a forested hillside in the background under a blue sky with scattered white clouds.
- *Expansion of terminals should go along with efficient use of available facilities.*

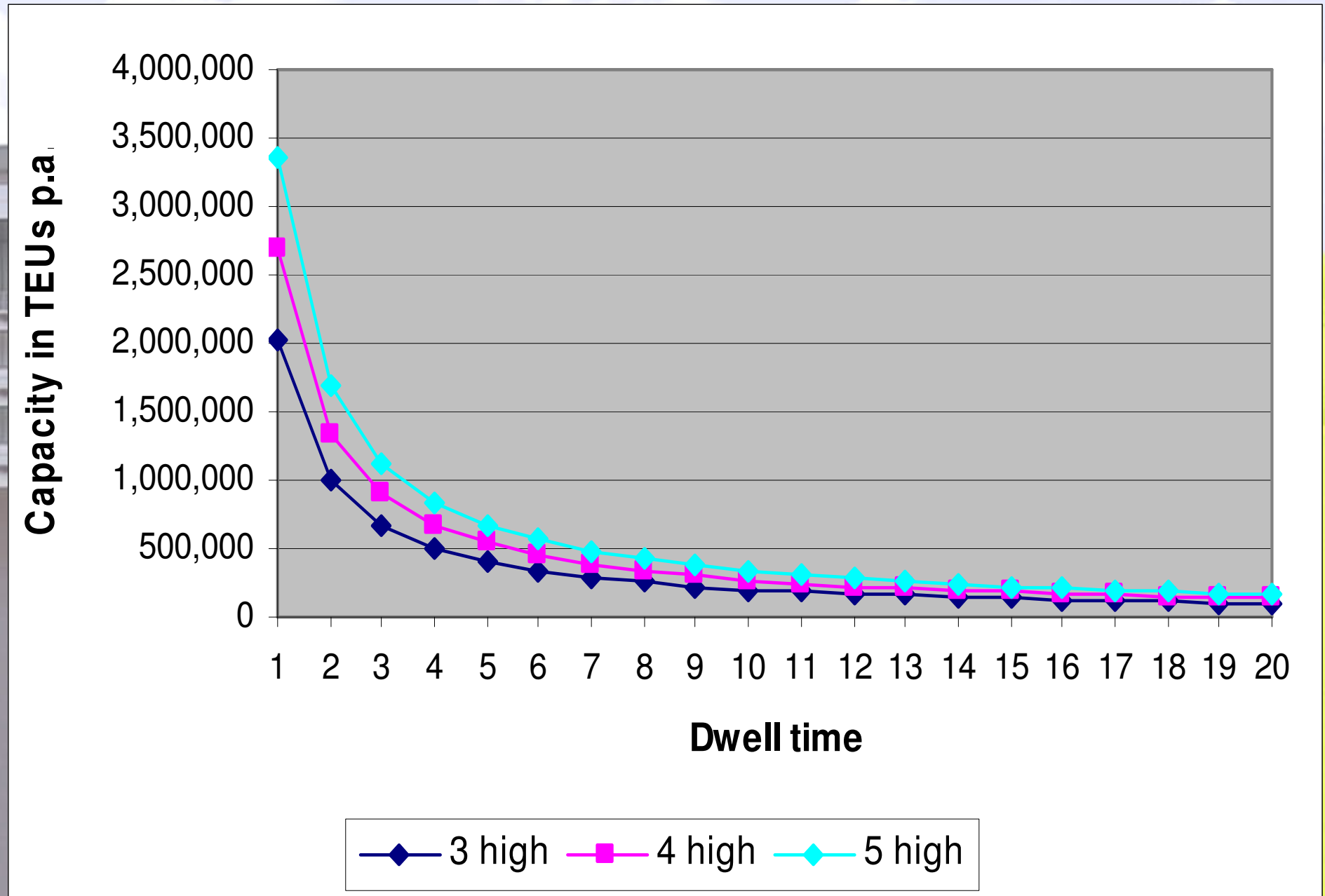
5.3 Dwell time:

Dwell time of cargo/containers is the most important factor influencing terminal capacity

Dwell time Model: Container terminal Dar es salaam port

- Terminal capacity is a function of ground slots, stacking height, peak factor and dwell time.
- The lesser the dwell time the more the capacity.

Terminal capacities (in TEUs) per annum: Slots = 2,990



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Dwell time (Days)	Stacking height		
	3	4	5
1	2,014,800	2,686,400	3,358,000
2	1,007,400	1,343,200	1,679,000
3	671,600	895,467	1,119,333
4	503,700	671,600	839,500
5	402,960	537,280	671,600
6	335,800	447,733	559,667
7	287,829	383,771	479,714
8	251,850	335,800	419,750
9	223,867	298,489	373,111
10	201,480	268,640	335,800
11	183,164	244,218	305,273
12	167,900	223,867	279,833
13	154,985	206,646	258,308
14	143,914	191,886	239,857
15	134,320	179,093	223,867
16	125,925	167,900	209,875
17	118,518	158,024	197,529
18	111,933	149,244	186,556
19	106,042	141,389	176,737
20	100,740	134,320	167,900

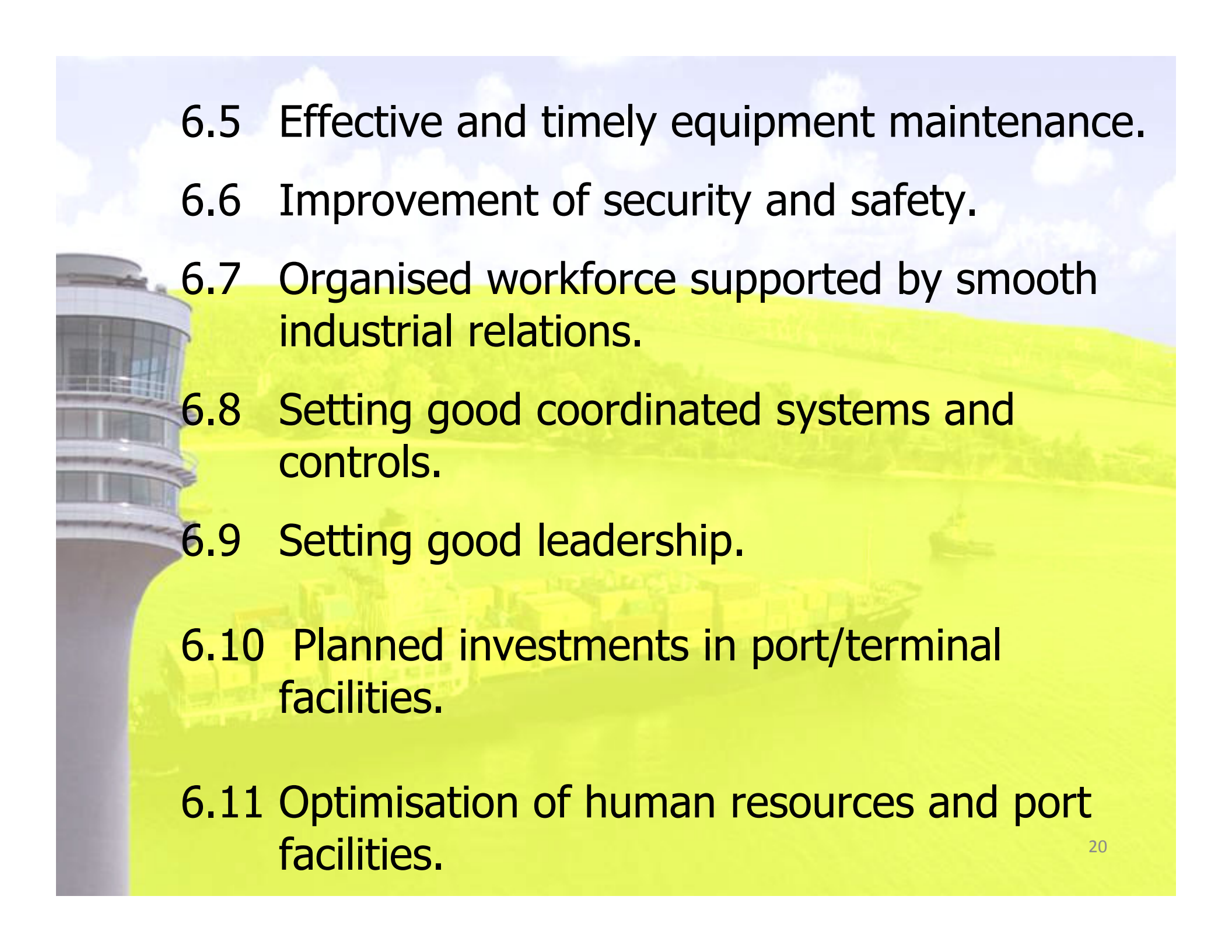
Projections TEUs p.a.

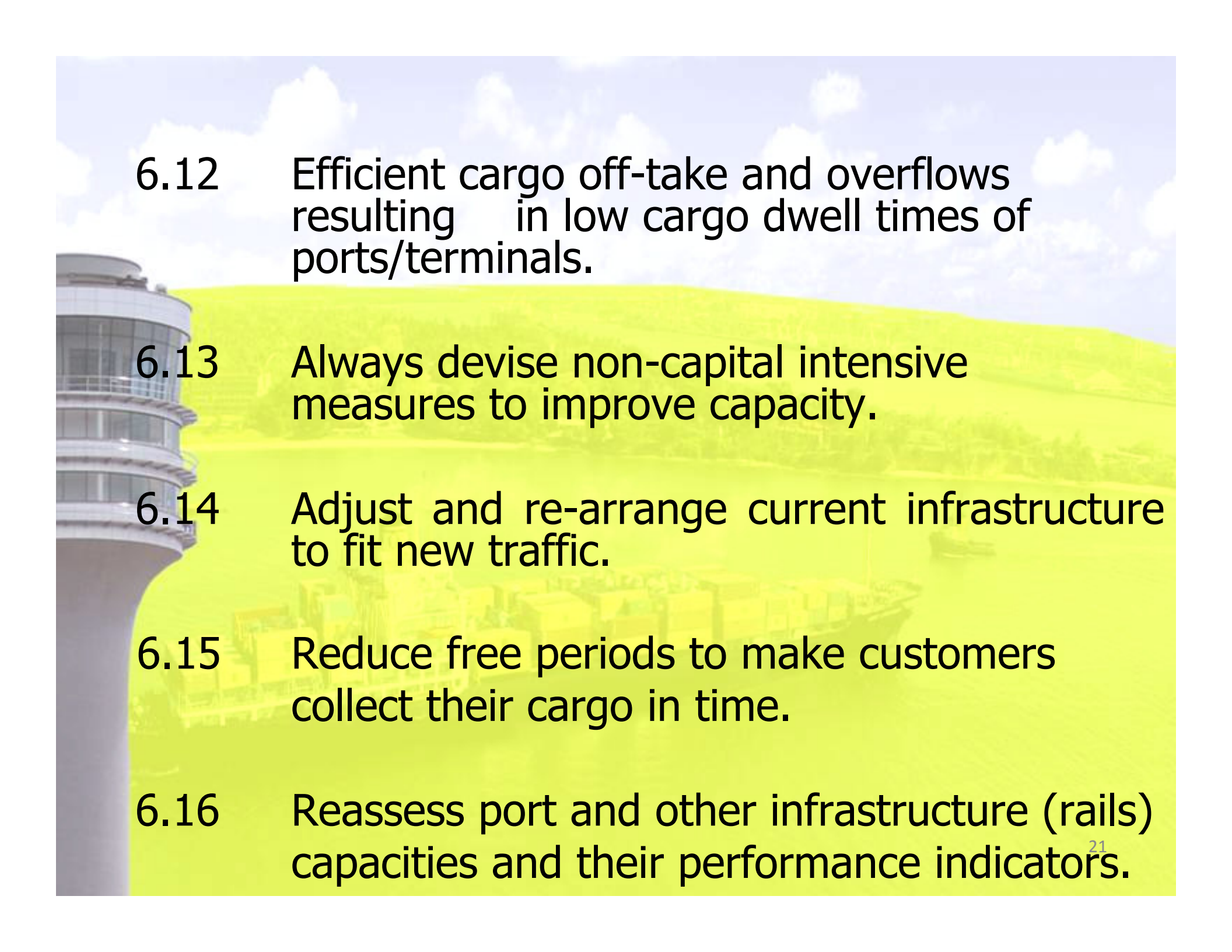
Year	TEUs
2007	355,800
2008	402,000
2009	454,300
2010	513,400
2011	580,100
2012	655,500
2013	740,800
2014	837,000
2015	945,900
2016	1,040,500
2018	1,259,000
2022	1,776,800
2025	2,238,300

6. PORT OPERATIONAL EFFICIENCY

Improving efficiency involves:

- 6.1 Faster and more efficient handling equipment.
- 6.2 Improving labour skills through training in accordance to fields of specialization.
- 6.3 Expansion of port capacities and intermodal infrastructure.
- 6.4 Acquisition of new technologies covering ship, yard and gate planning and operations.

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- The background of the slide features a blurred image of a modern, multi-story building with a curved facade on the left side. The rest of the background is a bright, yellowish-green color with a faint, semi-transparent image of a port terminal or industrial facility. The text is overlaid on this background in a clear, black, sans-serif font.
- 6.5 Effective and timely equipment maintenance.
 - 6.6 Improvement of security and safety.
 - 6.7 Organised workforce supported by smooth industrial relations.
 - 6.8 Setting good coordinated systems and controls.
 - 6.9 Setting good leadership.
 - 6.10 Planned investments in port/terminal facilities.
 - 6.11 Optimisation of human resources and port facilities.

The background of the slide features a photograph of a modern port terminal building with a curved facade and multiple levels of windows. The image is partially obscured by a large, semi-transparent yellow rectangular overlay that covers the right and bottom portions of the frame. The sky above the building is blue with scattered white clouds.

6.12 Efficient cargo off-take and overflows resulting in low cargo dwell times of ports/terminals.

6.13 Always devise non-capital intensive measures to improve capacity.

6.14 Adjust and re-arrange current infrastructure to fit new traffic.

6.15 Reduce free periods to make customers collect their cargo in time.

6.16 Reassess port and other infrastructure (rails) capacities and their performance indicators.

7. PORT PRODUCTIVITY

7.1 Ports measure performance with the following indicators:

- Service
- Output (Production)
- Utilization and
- Productivity

These can be easily remembered as SOUP.

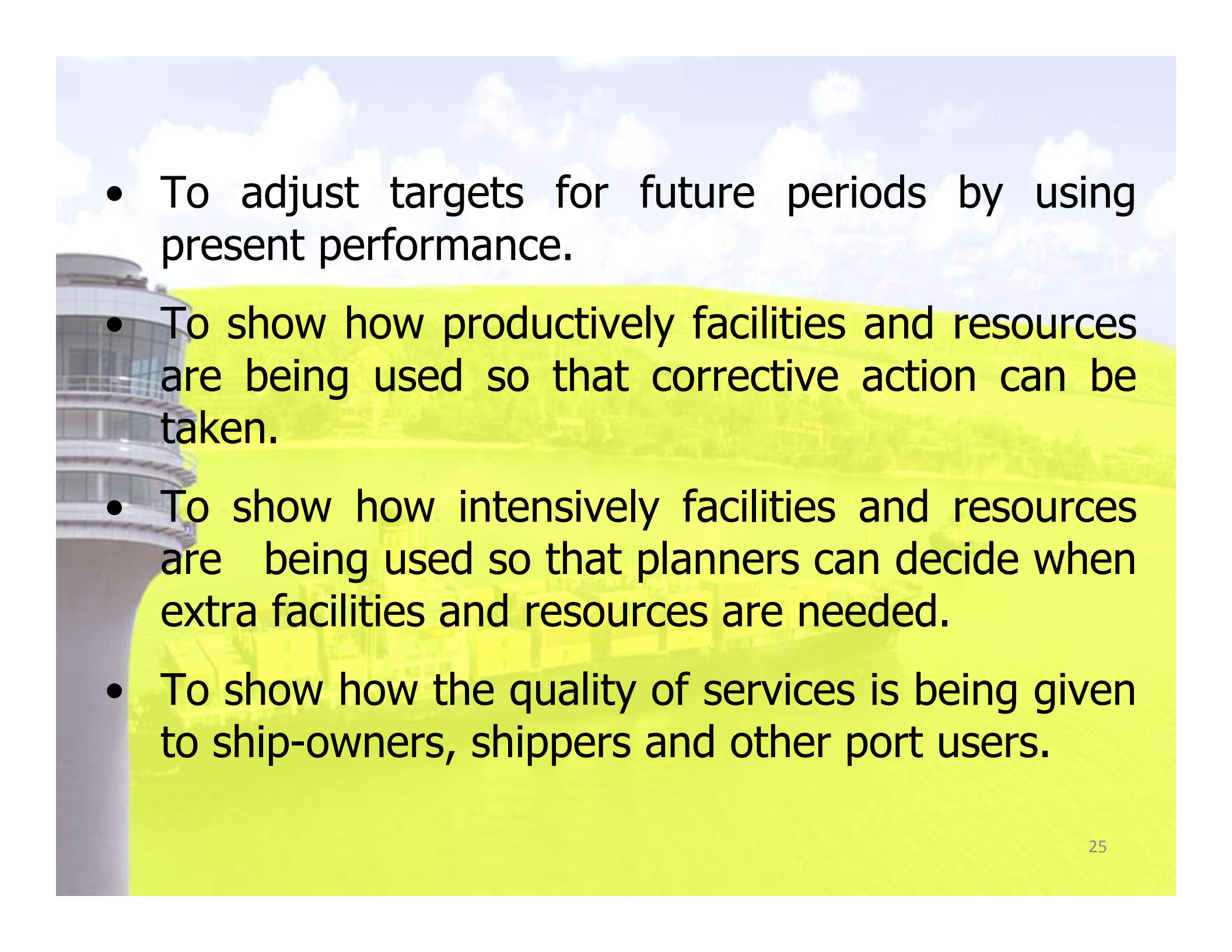
*DSM port is a model port in Port Management Association of Eastern and Southern Africa (PMAESA) region in measuring Port Performance.*²²

7.2 Objectives of performance indicators

- Help to provide high quality services to port users.
- Help to know how much business a port is doing, how well the business is being carried out, and what customers perceive about the services being provided.

7.3 Reasons for using performance indicators

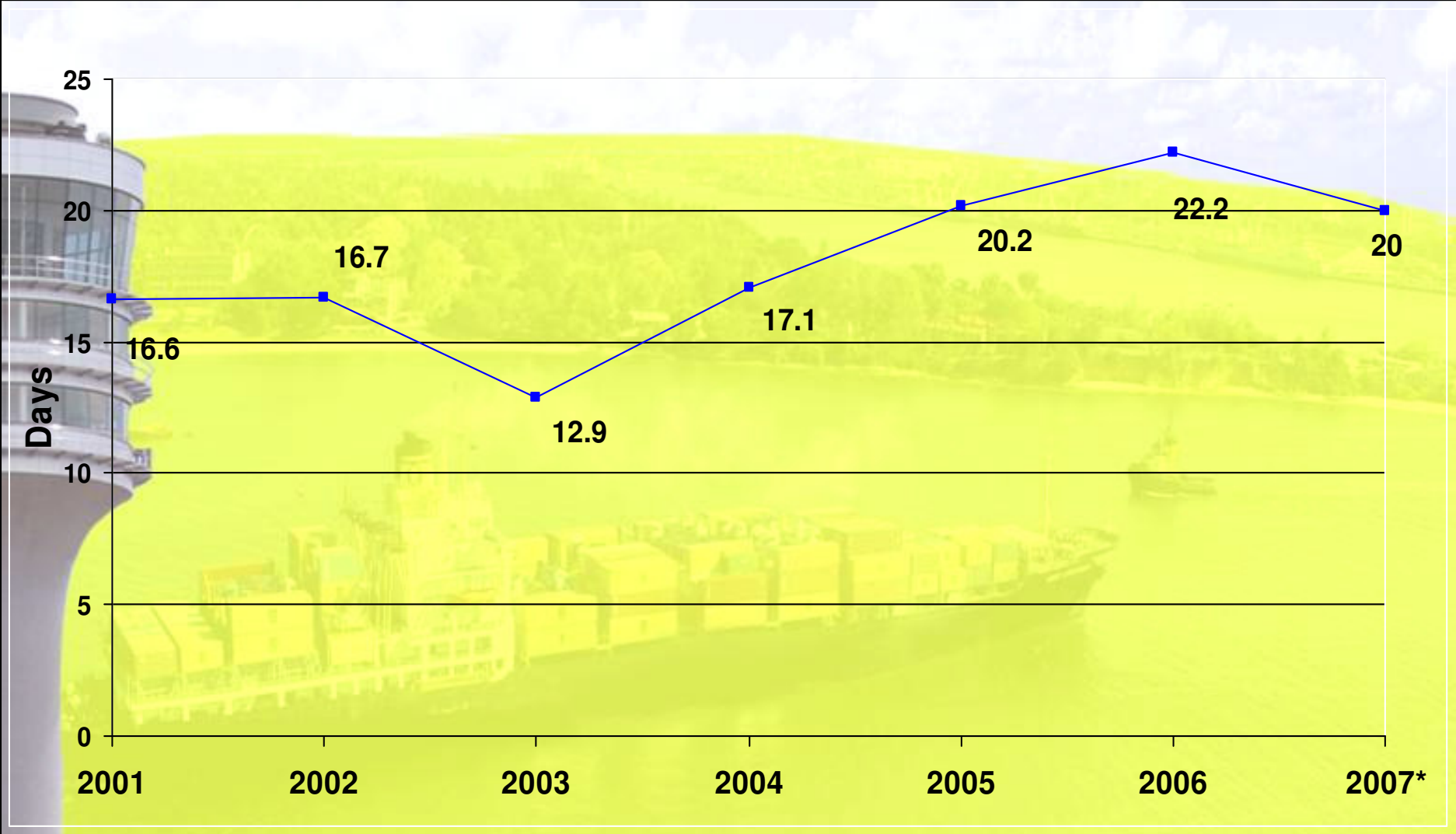
- To know how effectively and efficiently ports are operating.
- To know how present performance compares with past performance.
- To compare own performance with that of competitors.
- To promote business and attract new customers.

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- To adjust targets for future periods by using present performance.
 - To show how productively facilities and resources are being used so that corrective action can be taken.
 - To show how intensively facilities and resources are being used so that planners can decide when extra facilities and resources are needed.
 - To show how the quality of services is being given to ship-owners, shippers and other port users.

7.4 Services indicators

- Measure the quality of service provided to customers – ship owners, ship operators, importers, transport operators, etc.
- The most important measures of service are the ship turnaround time and container dwell time.

Import container dwell time (in days per container): DSM

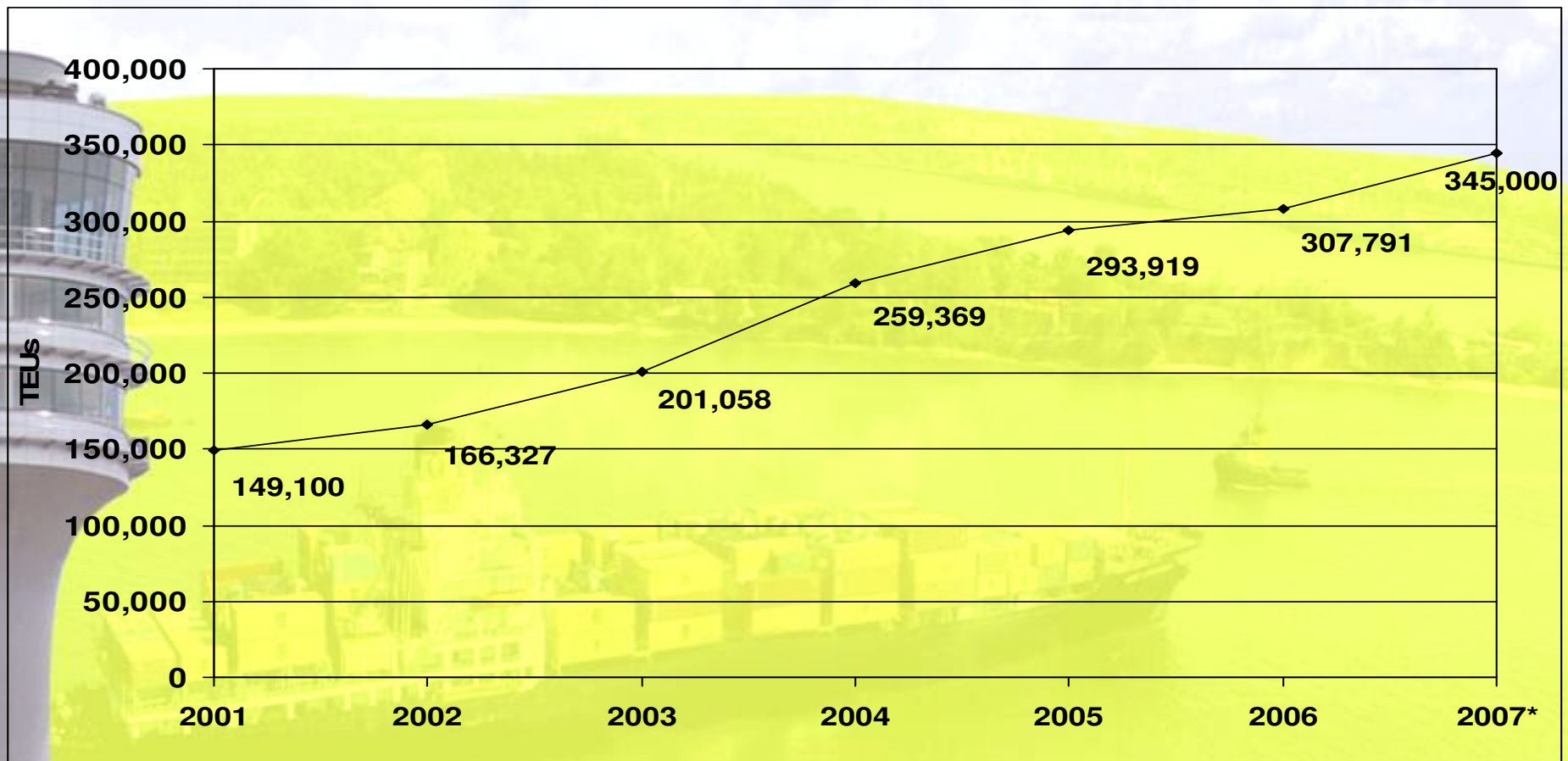


* Projected

7.5 Output (Production) Indicators

Measure the level of activity of the business at a terminal over a period of time. Examples: Traffic, throughput, Gang output, Ship output, etc.

Container throughput (in TEUs): DSM port Container Terminal



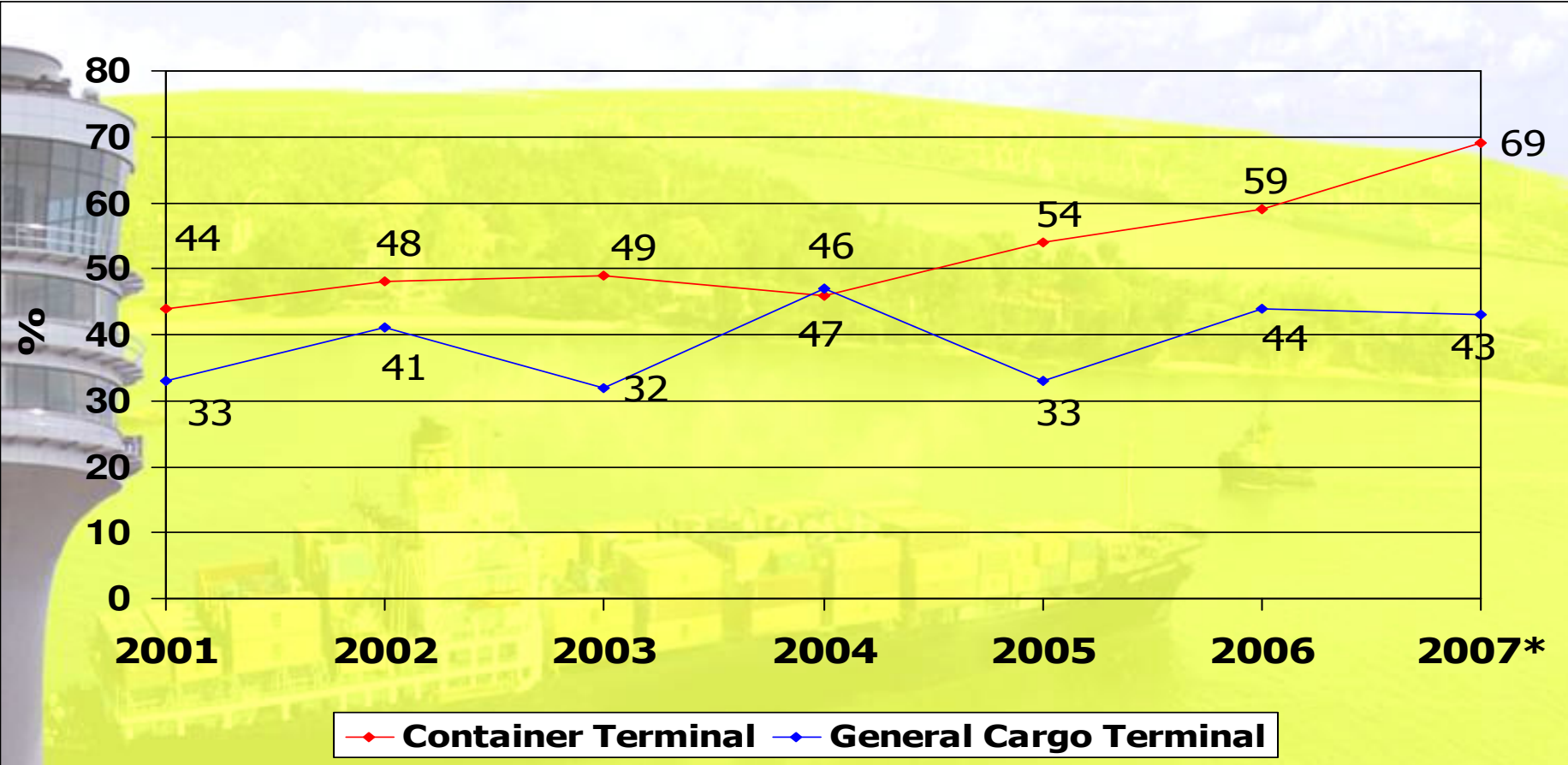
* Projected

- Rate of increase for the period: 15.0% per annum.

7.6 Utilization indicators

- Measure how intensively port facilities are being used and is normally expressed as a percentage. Examples: Berth occupancy, equipment utilization, gate utilization, etc.

Berth Occupancy (%): DSM Port

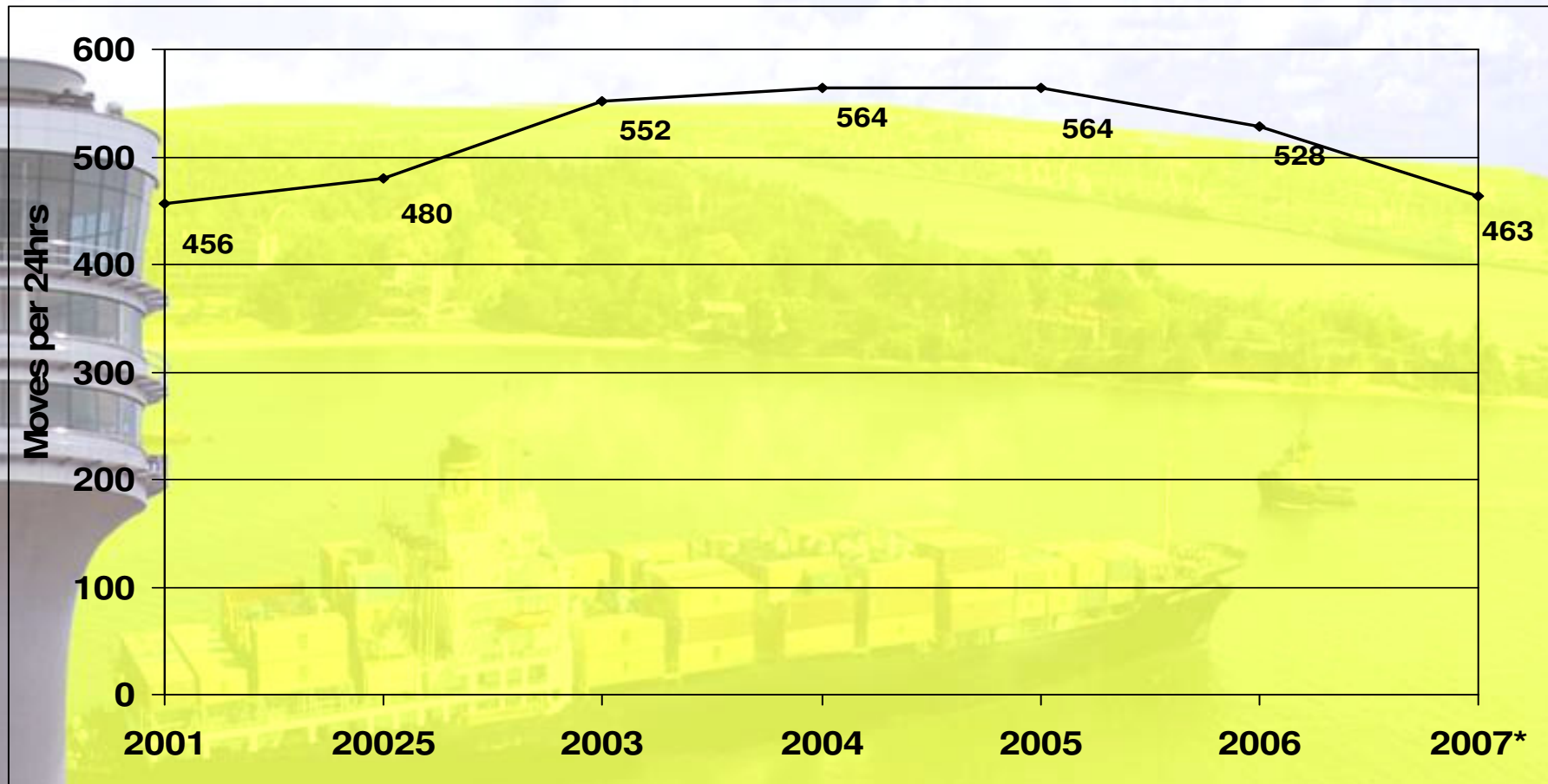


* Projected

7.7 Productivity indicators

- Measures of efficiency and cost-effectiveness of the terminal operations.
- Examples: Cost/tonne of cargo, labour cost/tonne, crane productivity (container moves/crane per hour), Ship productivity (container moves/ 24 hours), labour productivity (containers/man-hour), **etc.**

Crane productivity (moves/24hrs - Net)



* Projected

Performance drop in 2006/07 was contributed by congestion at the Container Terminal.

8. CHALLENGES FACING PORTS IN THE REGION

8.1 Capacity constraints

- Reduction of dwell time.
- Create adequate port capacity ahead of demand
 - Construction of ICDs. CFS.
 - Construction of new terminals.

8.2 Coping with shipping technological changes

- Dredging to increase draft in order to handle larger vessels.
- Provision of appropriate cargo and vessel handling equipment.
- Computerization of shipping/cargo operations and supporting services.

The background of the slide features a semi-transparent image of a port. On the left, a modern building with a curved facade and multiple levels of windows is visible. In the center, a large cargo ship is docked at a pier, with several yellow and red shipping containers stacked on its deck. The ship is positioned in a body of water, and a smaller boat is visible in the distance. The sky is blue with scattered white clouds. The entire image is overlaid with a semi-transparent yellow-green filter.

8.3 Sustained high productivity and efficiency levels

- Networking with stakeholders in reducing cargo dwell time.
- Capacity building through training.

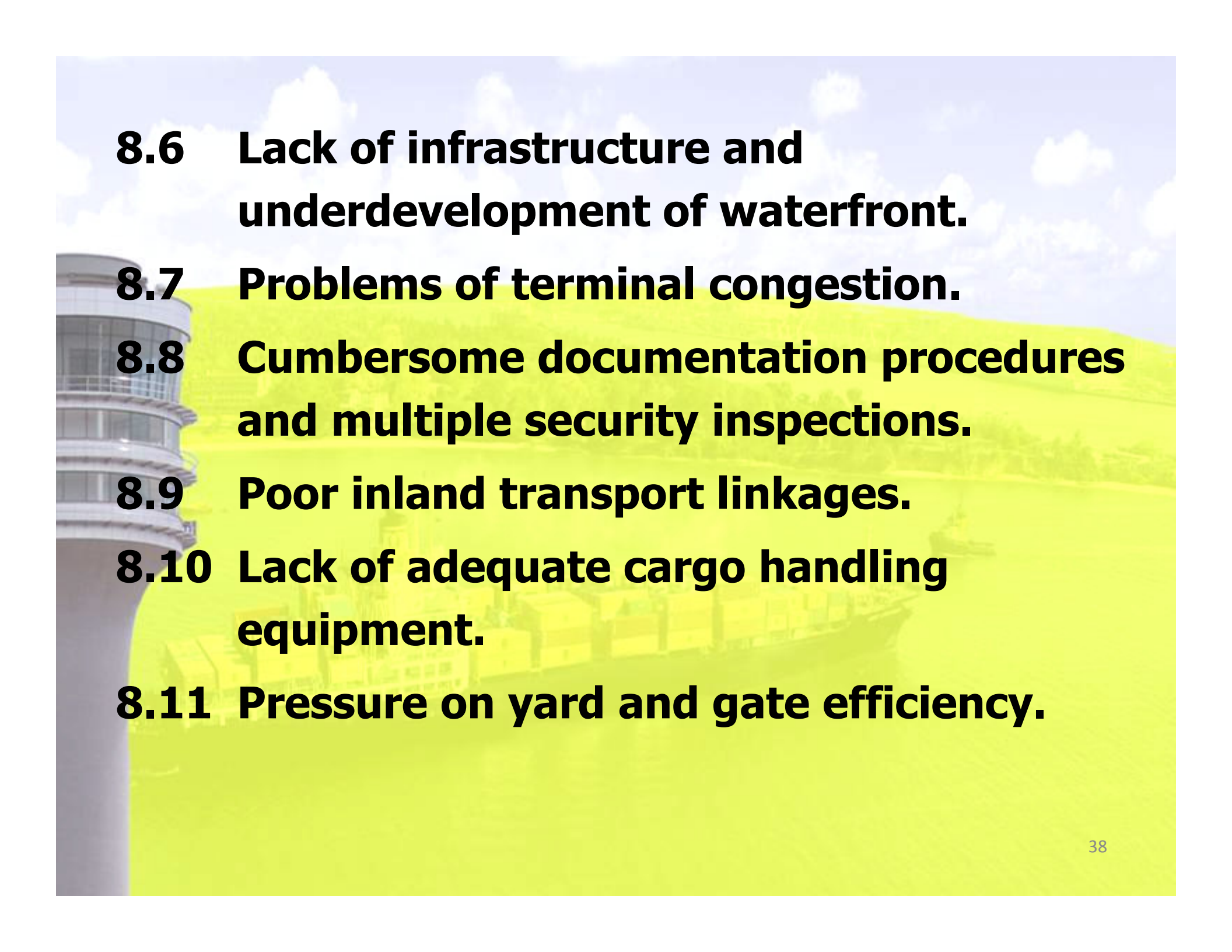
The background of the slide features a bright, sunny day at a port. On the left, a portion of a modern, multi-story building with a curved facade and large windows is visible. In the center and right, a large cargo ship is docked at a pier, with its deck and containers visible. The sky is a clear, vibrant blue with scattered white clouds. The overall scene is bright and clear, suggesting a clean and well-maintained port environment.

8.4 Environmental requirements and Sustainability

- Maritime developments to take into account environmental concerns.

8.5 Security and Safety requirements

- ISPS Code Compliance.
- IMO Conventions.
- Sub-standard ships calling at our ports.

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- The background of the slide features a blurred image of a modern, multi-story building with a curved facade on the left side. To the right, a large ship is docked at a port, with its structure and deck visible. The sky is bright blue with scattered white clouds. The overall scene suggests a maritime or industrial setting.
- 8.6 Lack of infrastructure and underdevelopment of waterfront.**
 - 8.7 Problems of terminal congestion.**
 - 8.8 Cumbersome documentation procedures and multiple security inspections.**
 - 8.9 Poor inland transport linkages.**
 - 8.10 Lack of adequate cargo handling equipment.**
 - 8.11 Pressure on yard and gate efficiency.**

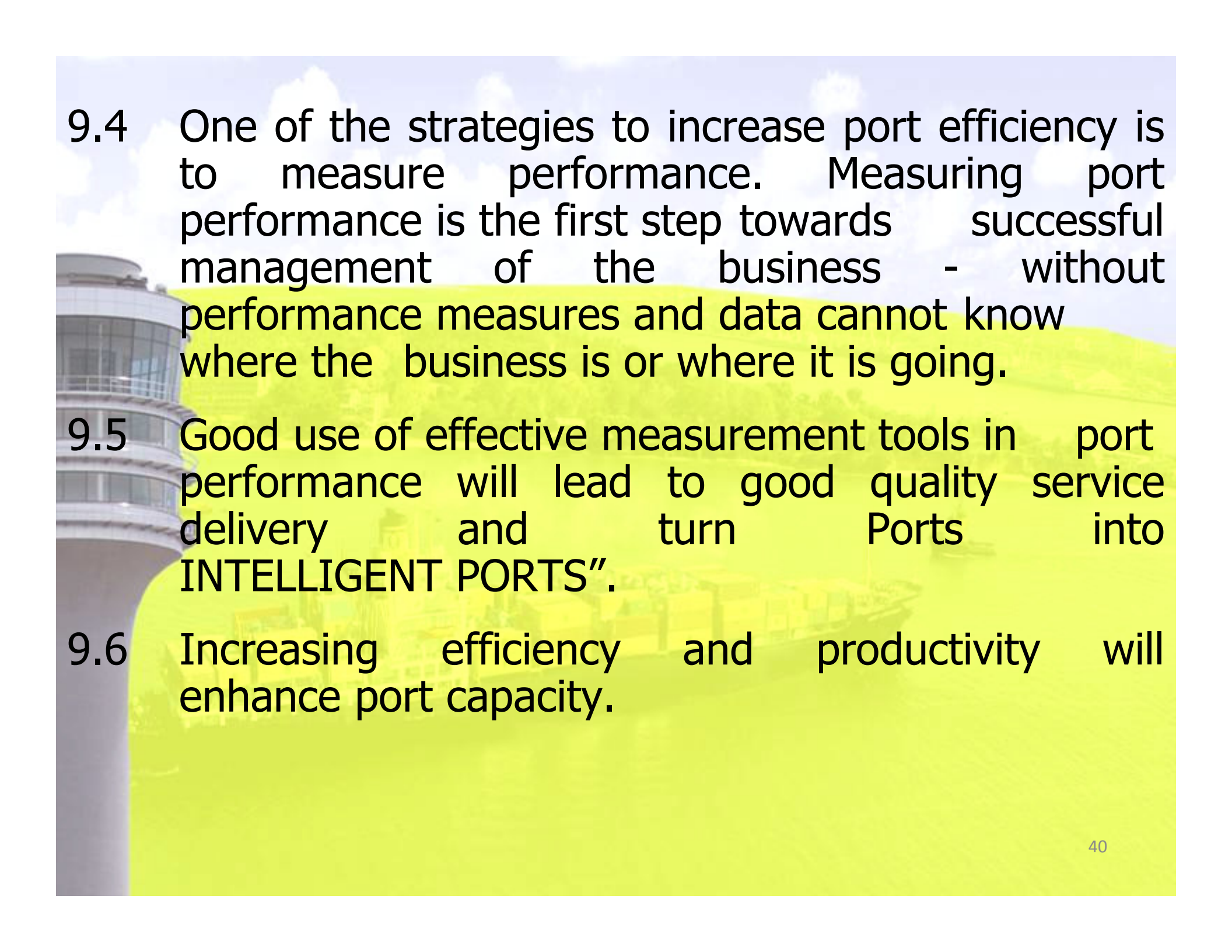
9. CONCLUSION

9.1 There will be continued demand for investment in port/terminal infrastructure.

9.2 Public Private Partnership (PPP) is the most promising vehicle for port investments.

9.3 Expansion of port capacity or increase in volume of cargo should always cope with the expansion of intermodal infrastructure.

- ***Lack of port capacity, without future plans, could result in reductions on the future volumes of traffic and thus port's traffic volumes can easily shift to other competing ports or other modes of transport.***



9.4 One of the strategies to increase port efficiency is to measure performance. Measuring port performance is the first step towards successful management of the business - without performance measures and data cannot know where the business is or where it is going.

9.5 Good use of effective measurement tools in port performance will lead to good quality service delivery and turn Ports into "INTELLIGENT PORTS".

9.6 Increasing efficiency and productivity will enhance port capacity.



9.7 Increasing efficiency delivers reduced turnaround time, increased cargo traffic, improved cargo off-take from the ports and increased customer satisfaction.

9.8 Cargo dwell time remains the most critical factor in port capacity, port efficiency and use of infrastructure.

9.9 Continued creation of capacity ahead of demand in PMAESA ports is urgently required.

9.10 Ports in PMAESA region should exchange information and experience and learn from each other in areas of infrastructure provision, efficiency and productivity.



THANK YOU