



World Food  
Programme

SAVING  
LIVES  
CHANGING  
LIVES



# Control Tower

## Joint Supply Chain Planning Approach

*April 2021*

## Fertilizer Import and Distribution: Overview



World Food Programme

# Fertilizer import and distribution in Ethiopia



## Overview

- Ethiopian Shipping and Logistics Service Enterprise **ESLSE** has the national mandate for fertilizer distribution, from load ports, via one unique entry point (Djibouti Port) to over 170 union warehouses using the road & rail network
- **Seasonal demand** from December/January to May/June (before agricultural season)
- Annual total target of about **2 million MT** purchase in lots of up to **75k MT** from *Morocco, Egypt, China, UAE, etc.*
- **Multiple stakeholders** involved: Ministries of Agriculture, Transport, Finance; EMAA, and others.

## A complex operation

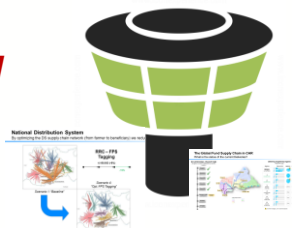
*For example, a daily discharge and dispatch target of 10,000 MT is required to deliver in time. This means that on average 5 of 6 available berths need to be utilized continuously.*

Supply chain inefficiencies due to **cumulative delays** of suppliers, **congestion** at Djibouti port, and on transporters' side. As a result:

**High risk of incurring demurrage costs & missing the seasonal window / deadline**

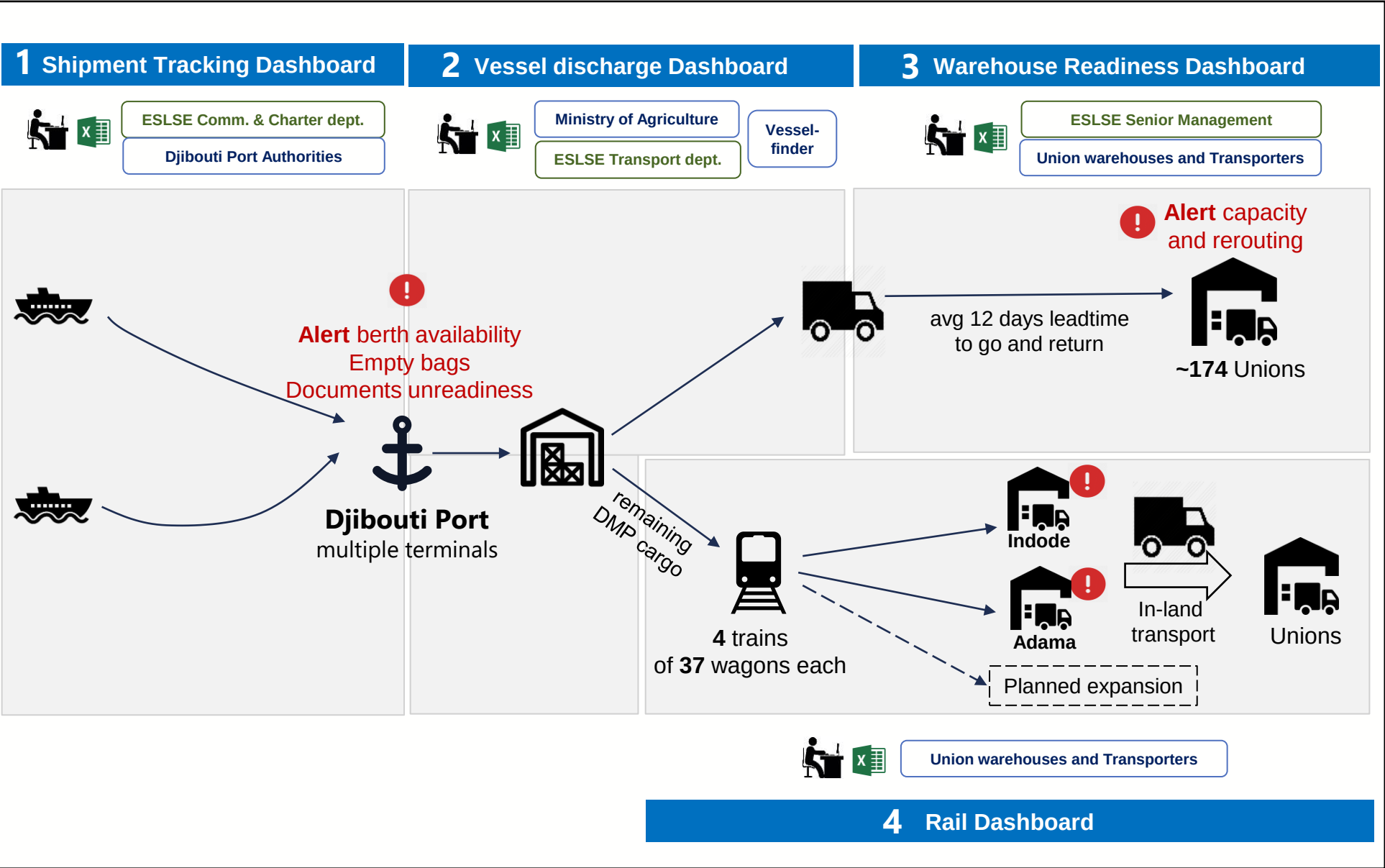


***A control tower is required to effectively and efficiently manage this large and complex operation, to have full visibility on the operation and to be agile.***



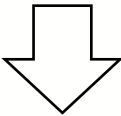


# Fertilizer Supply Chain overview



## Key Outputs

- 1 Daily Vessels status summary
- 2 Allocation vessels to destinations, unions, transporters  
GAP tracking
- 3 Tracking of transporters, warehouse capacities
- 4 Allocation of DMP volume to trains, rail stations, transporters



## Executive Summary

- Progress vs. Target
- Breakdown by Region & Products
- Transporter Performance
- Alerts at Port

## Maturity Assessment



World Food Programme

# Control Tower – Maturity assessment indicators

## DATA FLOW

- **Inputs** *are all relevant data included and tracked in the CT?*
- **Data collection** *is the process well defined with clear focal points/data sources?*
- **Data transformation** *is data processed in an efficient manner?*
- **Automation** *are the processes in place manual or automated? Any room for improvement?*
- **Visualization and Reporting** *are critical information transformed into standardized visuals to report to management?*



## ANALYTICS

- **Operational Alerts** *can critical issues be easily identified and flagged to the management?*
- **Analytics** *is data analyzed to support better planning? Can the type of analyses / recommendations be improved?*
- **Cost-efficiency analysis** *is the cost component considered to evaluate efficiency of the overall supply chain?*
- **Allocation optimization** *are optimization techniques being applied to identify optimal allocation of vessels to berths, cargo to trucks and trail, volumes to transporters and cargo to units? Could it be improved?*



## INTEGRATED PLANNING

- **Process** *are roles clear among different stakeholders and actors in the entire process? is/was there a coordinator?*
- **Stakeholder engagement** *are all relevant stakeholders included systematically in operations management?*
- **Meetings** *are the right meetings in place to facilitate integrated planning? (Who? When? What is discussed? Support docs?)?*
- **Information sharing** *Is information shared among relevant stakeholders (including external audiences)? How?*
- **Staff / Continuity** *are the right staff in place, and is the control tower robust to changes in staff / management?*



# Control Tower: Maturity assessment – *for discussion*

|                     | Indicator                                                                                                                                                               | Maturity | Potential areas of improvement                                                                                                                                                                                                                                                                                                                                 |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DATA FLOW           | <ul style="list-style-type: none"> <li>Inputs</li> <li>Data collection</li> <li>Data transformation</li> <li>Automation</li> <li>Visualization and Reporting</li> </ul> |          | <ul style="list-style-type: none"> <li>Extend visualization and reporting for <b>internal</b> and <b>external</b> purposes</li> <li>Include additional inputs (e.g., <b>costs</b>) and improve tracking of <b>lead times</b></li> <li>Automate inbound processes, including <b>systematization</b></li> </ul>                                                  |
| ANALYTICS           | <ul style="list-style-type: none"> <li>Operational Alerts</li> <li>Data Analytics</li> <li>Cost-efficiency analysis</li> <li>Allocation optimization</li> </ul>         |          | <ul style="list-style-type: none"> <li>Conduct regular <b>data-driven analysis</b> on the <b>efficiency of the supply chain</b> (cost, lead times, forecasts).</li> <li>Shift towards <b>Prescriptive</b> Analytics</li> <li>Make use of advanced mathematical models to <b>optimize allocation</b> (ex. volumes to <b>trains and transporters</b>)</li> </ul> |
| INTEGRATED PLANNING | <ul style="list-style-type: none"> <li>Process</li> <li>Stakeholder engagement</li> <li>Meetings</li> <li>Information sharing</li> <li>Staff / Continuity</li> </ul>    |          | <ul style="list-style-type: none"> <li>Invest in integrated planning to include <b>entire panel of stakeholders</b></li> <li>Integrate usage of the CT as a <b>basis for discussions and decision-making</b></li> <li><b>Institutionalize</b> the Control Tower</li> </ul>                                                                                     |

# Proposed areas for collaborations – *for discussion*

## DATA FLOW

**Improvement of Data Visualization** of key steps of the supply chain by designing a Dashboard for internal and/or external purposes that integrates the individual Excel dashboards into a single visual overview

**Inclusion of additional inputs** – for example costs

**Improvement of Data tracking** in particular lead times and delays – at Djibouti port, in-land transportation



## ANALYTICS

**Support to perform Cost-efficiency Analysis** to be regularly performed

**Automation and systematization** of data inputs, analysis, and visualization (longer term)

**Implementation of Advanced Mathematical models** to support optimized allocation of volumes to available resources considering operational constraints (such as minimum of 3 local transporters for each train, maximum of 3 days for lifting cargo once arrived at the station, ...)



## INTEGRATED PLANNING

**Institutionalization** of the Control Tower Approach (staff, integration in processes, external coms, etc.)

**Integration** of all the analyses done by the Control Tower into a single holistic overview to drive meetings

**Potential expansion of the ESLSE control tower** to other stakeholders (MoA, MoF, MoT, EMMA, etc.); explore analyses towards this integration (joint decision on allocations, national vessel planning, etc.)

**CONOPS 2022:** end-to-end Supply Chain Plan for the next fertilizer season





## Visualization and Reporting

*Illustrative examples for a potential holistic  
Operational Dashboard for integrated planning & operations management*

# Fertilizer Overview - sample

illustrative

**1.8M**

Total MT distributed  
**90% of target 2.0M**

**30% | 70%**



Total MT allocation

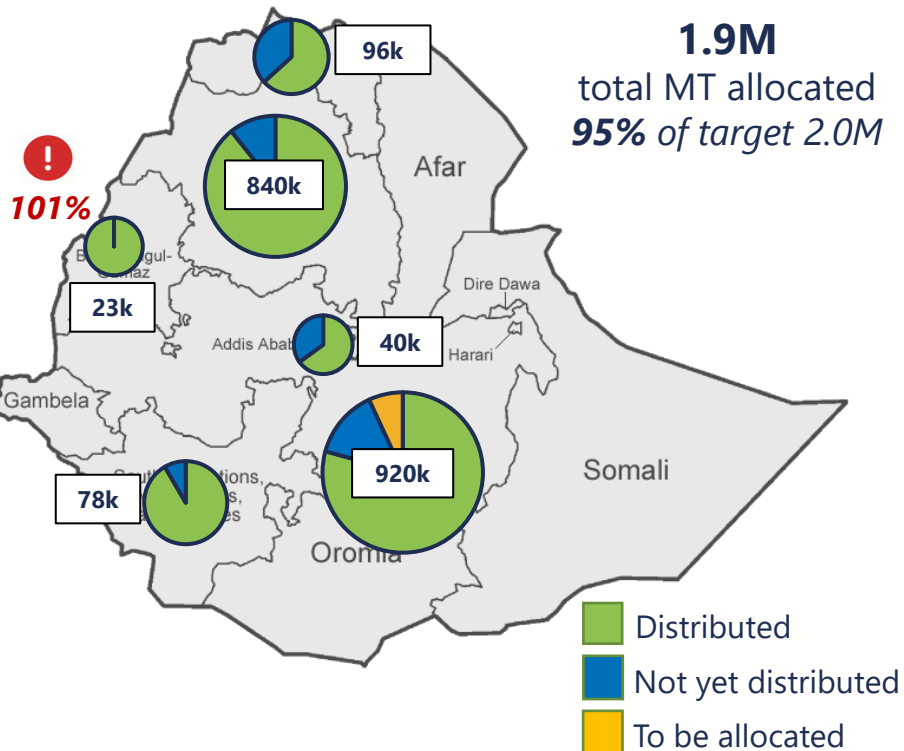
**10 days**

to complete distribution  
**97% time passed**

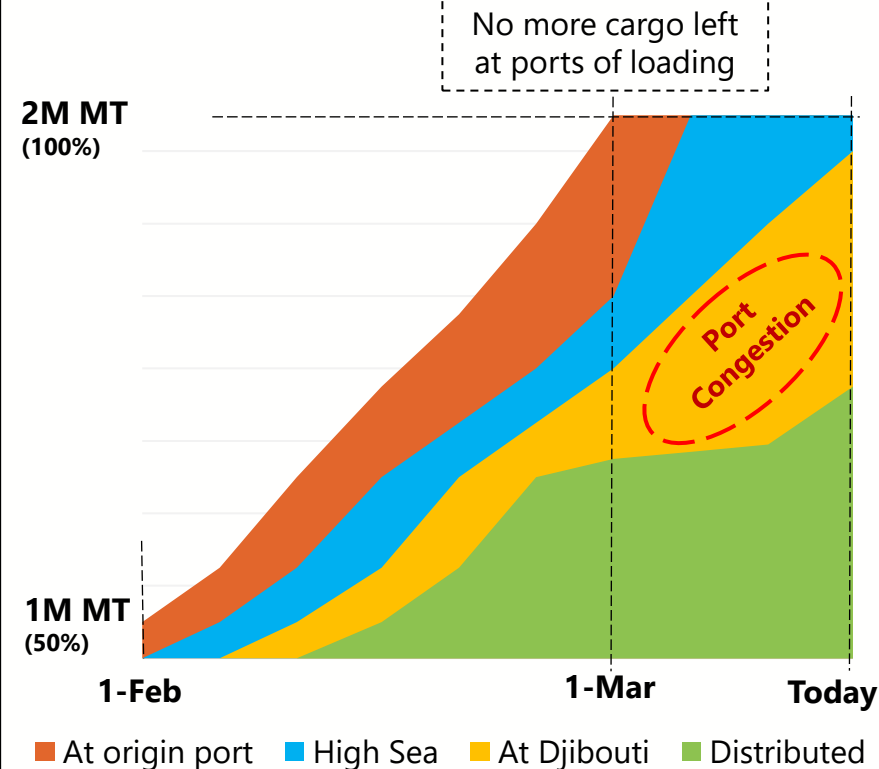
**X M Birr**

Total cost  
**20% transport costs**

## Total allocation by region



## Pipeline status (last 3 months)



## Average Delays

Actual vs Forecast per vessel

- 5.8 days** supplier delays (departure port of loading)
- 3.7 days** on high seas (delayed arrival at Djibouti)
- 1.2 days** for berthing (ETB->ETC)
- 2 days** per transporter (late deliveries of trucks)

## Highlights & Actions required

- 4 vessels at Anchorage are incurring into berthing delays
- Truck-Rail re-allocation needed due to unavailable warehouse capacity

# Daily Shipping tracking Report - sample

illustrative

20 (67%)

vessels discharged of a total nominated 30.  
(including ongoing discharges)

6 (24%)

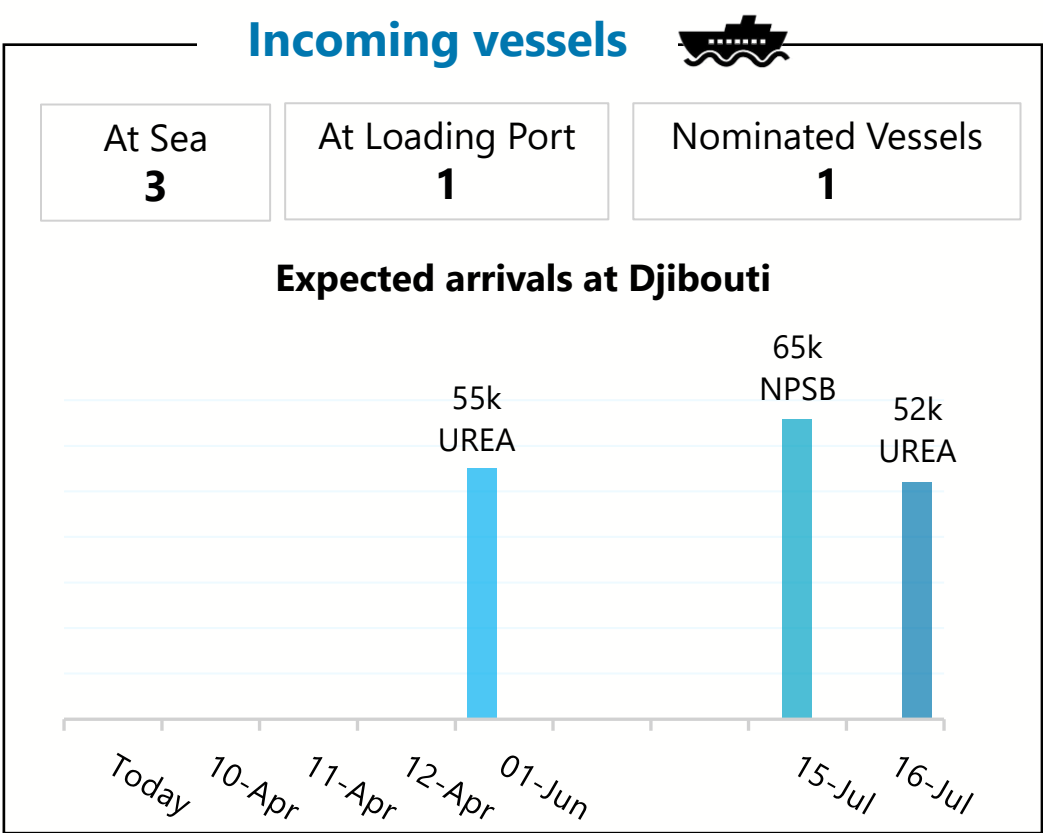
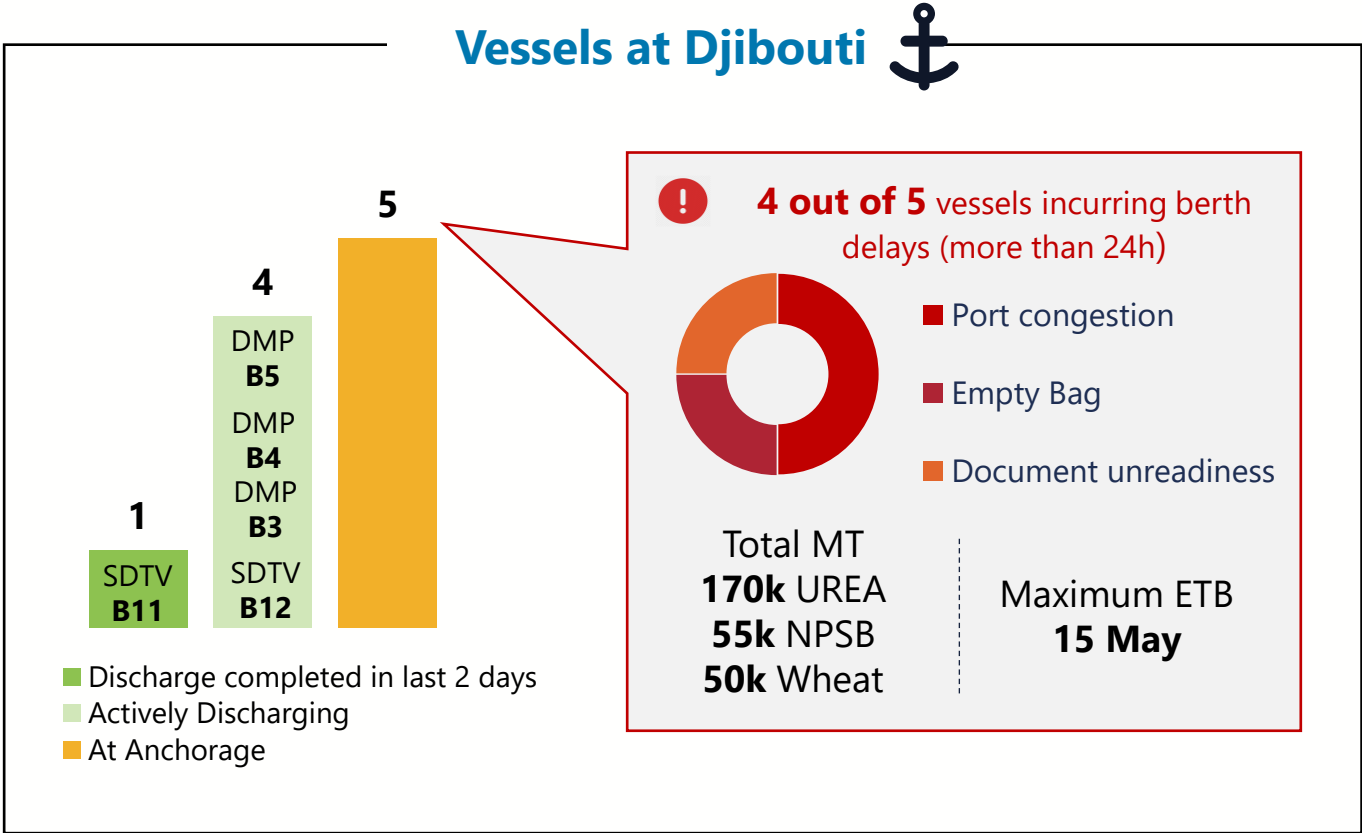
Total Berth Readiness  
(vessels able to berth within 24h of arrival)

4 (16%)

Total Empty Bag issues  
(number of vessels without sufficient empty bags, including at anchorage)

X Birr

Total demurrage costs



# Djibouti Port Overview: Berth, Anchorage, and Expected 2-month outlook

illustrative

|           |      | S                      | S      | M      | T      | W      | T      | F      | S      | S      | M      | T               | W      | T      | F      | S      | S      | M      | T      | W      | T      | F            | S      | S      | M      | T      | W      | T      | F      | S      | S      | M      | T      | W      | T      | F      | S      | S      | M      | T      | W      | T      | F      | S      | S      | M      | T      | W      | T      | F      | S      | S      | M      | T      | W      | T      |        |        |        |        |        |        |        |
|-----------|------|------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
|           |      | 10-Apr                 | 11-Apr | 12-Apr | 13-Apr | 14-Apr | 15-Apr | 16-Apr | 17-Apr | 18-Apr | 19-Apr | 20-Apr          | 21-Apr | 22-Apr | 23-Apr | 24-Apr | 25-Apr | 26-Apr | 27-Apr | 28-Apr | 29-Apr | 30-Apr       | 01-May | 02-May | 03-May | 04-May | 05-May | 06-May | 07-May | 08-May | 09-May | 10-May | 11-May | 12-May | 13-May | 14-May | 15-May | 16-May | 17-May | 18-May | 19-May | 20-May | 21-May | 22-May | 23-May | 24-May | 25-May | 26-May | 27-May | 28-May | 29-May | 30-May | 31-May | 01-Jun | 02-Jun | 03-Jun | 04-Jun | 05-Jun | 06-Jun | 07-Jun | 08-Jun | 09-Jun | 10-Jun |
|           |      | MV Cas Amares          |        |        |        |        |        |        |        |        |        | MV Popis        |        |        |        |        |        |        |        |        |        | MV Riva Wind |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
| DMP       | B5   | MV Cas Amares          |        |        |        |        |        |        |        |        |        | MV Popis        |        |        |        |        |        |        |        |        |        | MV Riva Wind |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
|           | B4   | MV SBI Phoebe          |        |        |        |        |        |        |        |        |        | MV Scarlet Lady |        |        |        |        |        |        |        |        |        |              |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
|           | B3   | MV Global Andes        |        |        |        |        |        |        |        |        |        | MV Papa John    |        |        |        |        |        |        |        |        |        |              |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
|           | B2   | MV Maryam              |        |        |        |        |        |        |        |        |        | MV Welfine      |        |        |        |        |        |        |        |        |        |              |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
| SDTV      | B11  | MV Marmara             |        |        |        |        |        |        |        |        |        | MV Bonneville   |        |        |        |        |        |        |        |        |        |              |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
|           | B12  | MV Gravity             |        |        |        |        |        |        |        |        |        |                 |        |        |        |        |        |        |        |        |        |              |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
| Anchorage | A1   | MV Popis --> B5        |        |        |        |        |        |        |        |        |        | MV Riva Wind    |        |        |        |        |        |        |        |        |        | --> B5       |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
|           | A2   | MV Scarlet Lady --> B4 |        |        |        |        |        |        |        |        |        |                 |        |        |        |        |        |        |        |        |        |              |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
|           | A3   | MV Papa John !         |        |        |        |        |        |        |        |        |        | --> B3          |        |        |        |        |        |        |        |        |        |              |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
|           | A4   | MV Welfine             |        |        |        |        |        |        |        |        |        | --> B2          |        |        |        |        |        |        |        |        |        |              |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
|           | A5   |                        |        |        |        |        |        |        |        |        |        | !               |        |        |        |        |        |        |        |        |        |              |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
| High Seas | HS 1 | MV Maryam --> B2       |        |        |        |        |        |        |        |        |        | MV Welfine      |        |        |        |        |        |        |        |        |        | --> A4       |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
|           | HS 2 | MV Gravity --> B12     |        |        |        |        |        |        |        |        |        | MV Riva Wind    |        |        |        |        |        |        |        |        |        | --> A1       |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
|           | HS 3 | MV Popis               |        |        |        |        |        |        |        |        |        | --> A1          |        |        |        |        |        |        |        |        |        |              |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
|           | HS 4 | MV Scarlet Lady        |        |        |        |        |        |        |        |        |        | --> A2          |        |        |        |        |        |        |        |        |        |              |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
|           | HS 5 | MV Papa John           |        |        |        |        |        |        |        |        |        | --> A3          |        |        |        |        |        |        |        |        |        |              |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
|           | HS 6 | MV Bonneville          |        |        |        |        |        |        |        |        |        | --> B12         |        |        |        |        |        |        |        |        |        |              |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |



**Congestion Expected!**  
**Up to USD 3 M demurrage cost!**

Delay MV Papa John, MV Welfine, and MV Riva Wind if possible!

# Daily Tracking Distribution details - sample

illustrative

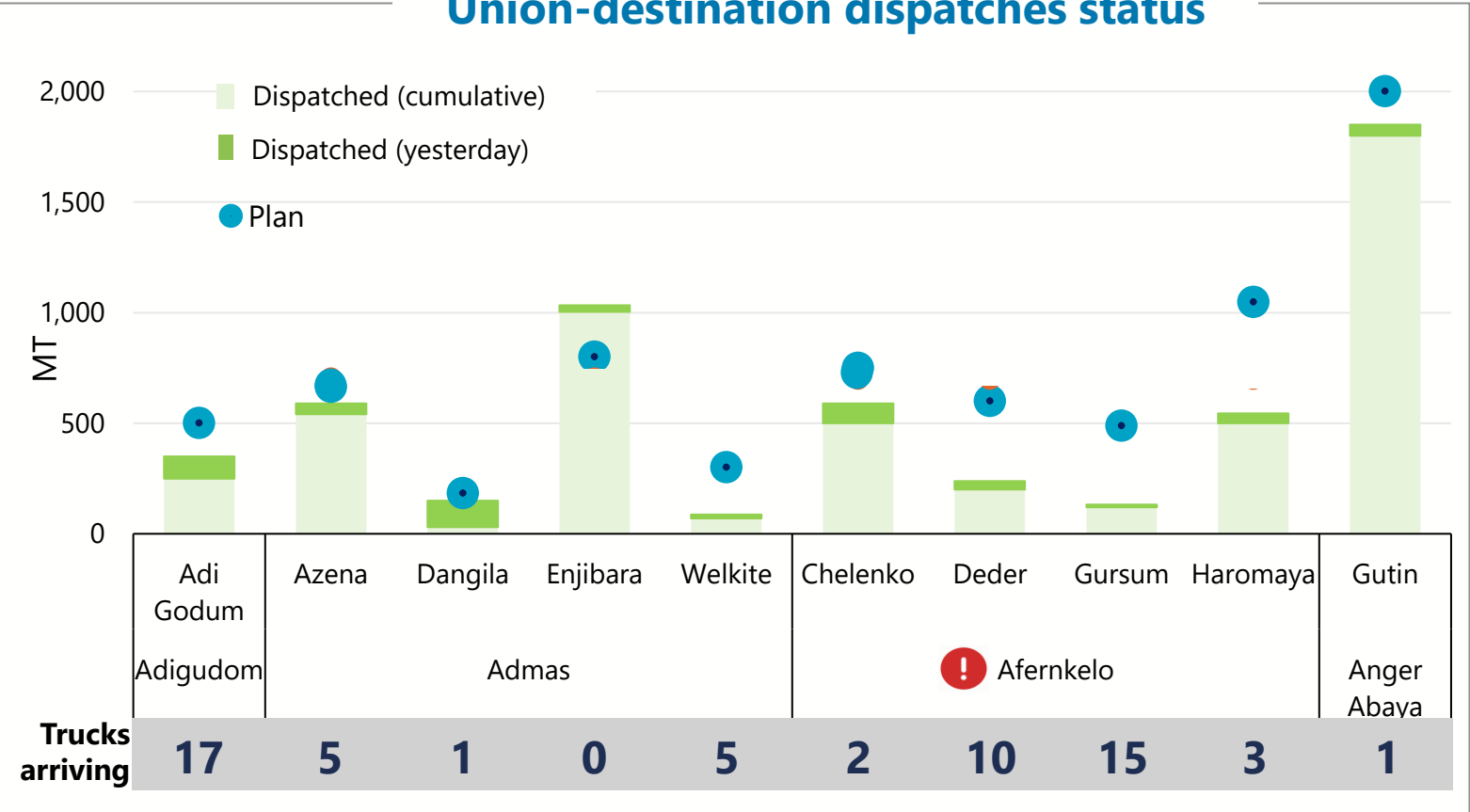
250 🚚 | 37 🚂 = 12,590 MT

Daily Uplift Target required to finish on June 1<sup>st</sup>

18 🚚 | 0 🚂 = 765 MT

Performance Yesterday

## Union-destination dispatches status



## Transporter performances

|          | Completed MT | Allocated MT |
|----------|--------------|--------------|
| Bekelcha | 30%          | 59k          |
| Bright   | 80%          | 88k          |
| Dalol    | 0%           | 1.6k         |
| Degen    | 0%           | 91k          |
| Fetan    | 60%          | 70k          |
| Getas    | 100%         | 17k          |

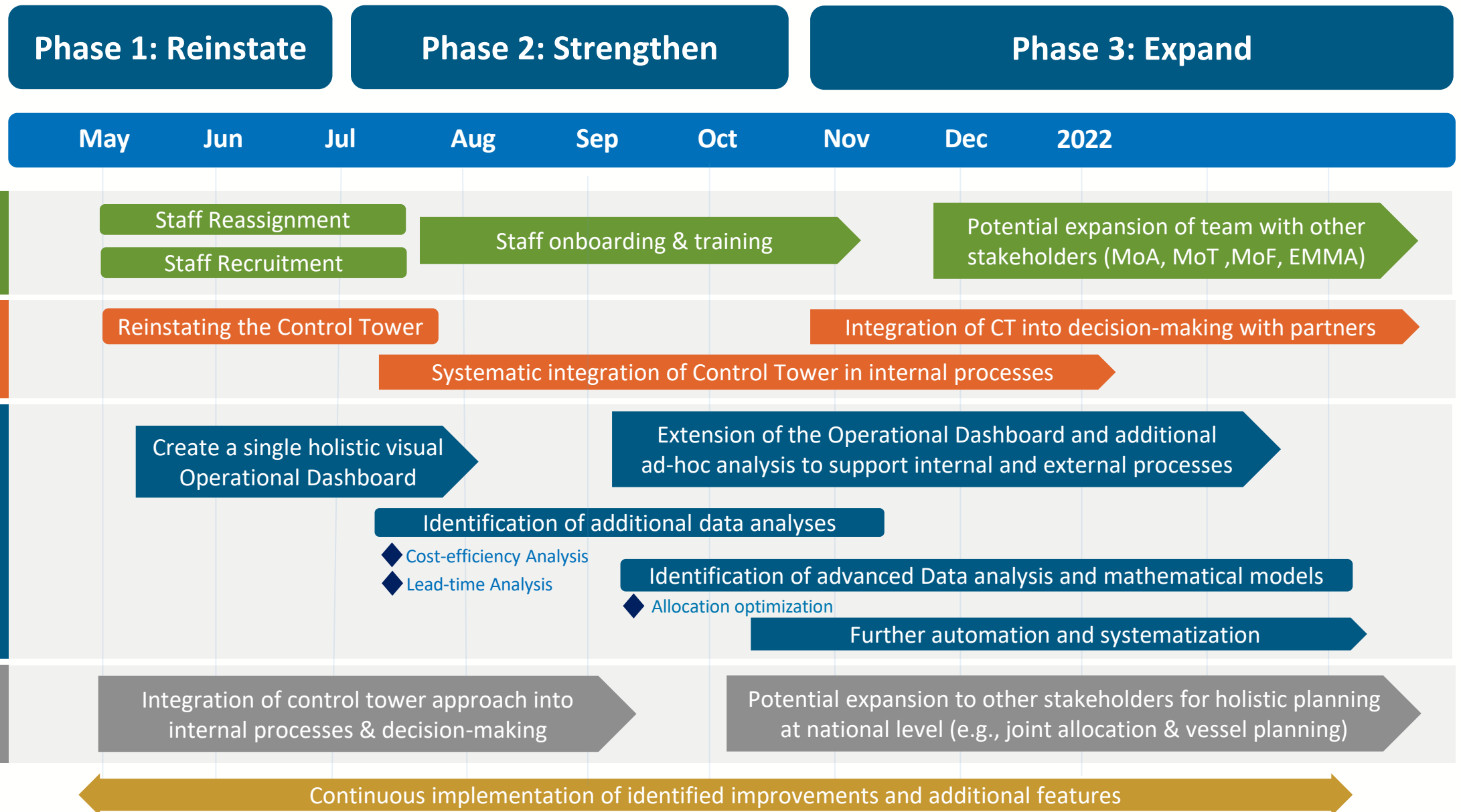


## Proposed Approach



World Food Programme

# Potential Roadmap for implementation – *for discussion*



# WFP Proposed Support – *for discussion*

## Assumptions

*Based on the drafted Roadmap, we foresee the following support to be potentially provided during the project duration, **assuming a strong collaboration with a full structured Control Tower team** over the next months (with no interruption during the summer period) to set up strong basis for the opening of the next fertilizer season.*

### Team Coordination and SC working Group

**Support with the Team onboarding process** to ensure an efficient reinstate of the Control Tower tool and approach and to introduce the staff to the overall project, as well as strengthening the ESLSE – WFP working relationship.

**Support in setting up regular internal technical and cross functional management meetings** (CT team/ESLSE management/other ESLSE department/external actors). Facilitate discussion to ensure progresses of the project against goals and ensure a clear dissemination and utilization of the Control Tower tool key findings and Operational Dashboard for better decision-making.

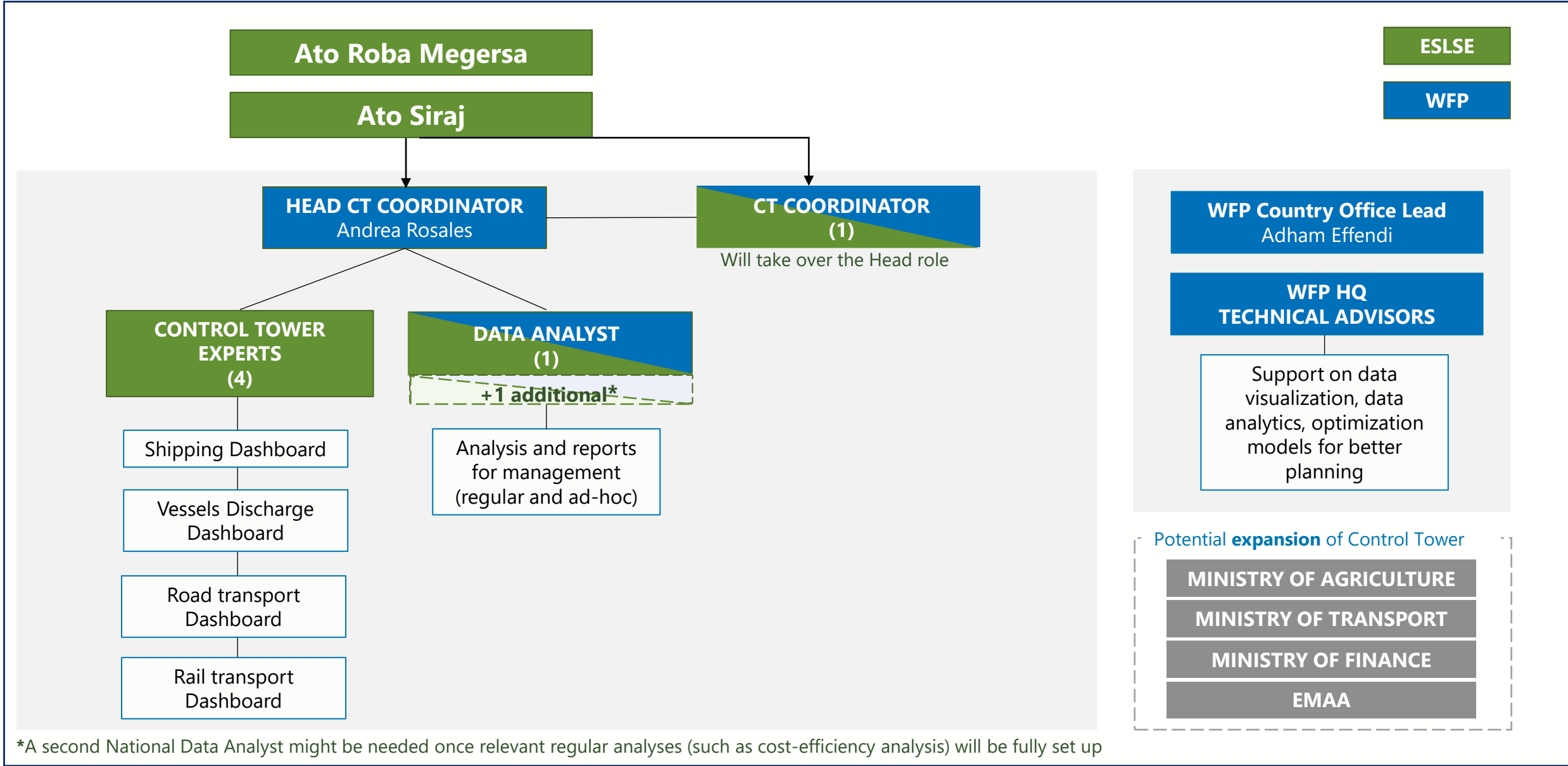
Support ESLSE with **internal/external institutionalization** of the CT approach

### Solution development

Identify and implement **supply chain planning and data-analyses techniques** in close collaboration with the Control Tower team, in particular to:

- Improve and extend the Control Tower to include additional relevant data (cost, lead time information, etc.),
- Implement a new holistic Operational Dashboard to provide a single and comprehensive overview of the operation (initial software utilized will be Excel and Power Point – pragmatic approach),
- Set up and perform basic cost-efficiency analysis,
- Set up and perform advanced data analyses such as Allocation Optimization.

# Control Tower: Potential Organigram – *for discussion*



Thank you for the **attention** and your **support**



World Food Programme