

Engineer for Zero Hunger: Data Analytics Visualization to Scan Humanitarian Supply Chain Vulnerabilities in the Middle East Context

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"Are we willing to lose a generation of children to hunger?"

Ertharin Cousin

Executive Director of the United Nations – WFP [1]

Abstract

This dissertation focuses on the optimization of the World Food Programme's Supply Chain, the biggest United Nations agency. This project was developed in the Regional Bureau of Cairo (RBC), responsible for providing strategic guidance, policy and technical support, and direction to WFP operations and activities for 18 countries in the areas of Middle East, North Africa, Central Asia and Eastern Europe.

A Supply Chain Management tool was developed to help scanning a set of problems that this humanitarian supply chain faces daily. Making use of a Business Intelligence solution in a Humanitarian Supply Chain will raise awareness among the actors involved for a set of future problems, challenges and bottlenecks. The aim is to bring more visibility for the entire supply chain as well as a holistic view of the processes involved. The ability to effectively manage a supply chain has a direct impact on the organization's bottom line.

The potential risks and opportunities highlighted in this dissertation are focus on the Middle East. Helping to optimize the way supply chain deliveries in this region, where the number of conflicts increases every day, will provide a better food aid assistance and contributes to pacify the life of those in the most need - WFP beneficiaries.

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Acronyms:

BI - Business Intelligence

CBT - Cash Based Transference

C&V - Cash and Vouchers

CD&A - Capacity Development and Augmentation

CP - Country Programmes

CO - Country Office

DEV - Development Projects

DSS - Decision Support Systems

ERP - Enterprise Resource Planning

EMOP - Emergency Operations

GCMF - Global Commodity Management Facility

GFD - General Food Distribution

HQ - Headquarters

IK - In-kind

IPO - Internal Purchase Order

LESS - Logistics Execution Support System

MT - Metric Ton

OSC - Supply Chain Division

PMT - Project Pipeline Management Tool

PO -Purchase Order

PR - Purchase Requisition

PRRO - protracted relief and recovery operations

RB - Regional Bureaus

RBC - Regional Bureau of Cairo

RBD - Regional Bureau of Dakar

RBB - Regional Bureau of Bangkok

RBJ - Regional Bureau of Johannesburg

RBP - Regional Bureau of Panama

RBN - Regional Bureau of Nairobi

WINGS - WFP Information Network and Global System

WFP - World Food Programme

RBP - Resource Based Planning

RMBP - Project Budget and Programming Service

SAP - Systems, Applications and Products.

SC - Supply Chain

SCM - Supply Chain Management

SCM-D - Supply Chain Management Dashboard

SO - Special Operations

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Introduction

In a typical year, the World Food Programme (WFP) supply chain reaches 80 million people in need of food assistance. Given the complexities of running such a large-scale operation, improving planning is essential to manage on-time deliveries and scale-up their support to reach more beneficiaries with the same resources. The unpredictability of disasters and crises and the difficulty to forecast the ebb and flow of donor contributions make this function all the more important.

This dissertation aims to develop a tool to support and facilitate the planning of WFP's Supply Chain to evolve a more flexible, cost-efficient and reliable way of addressing hunger and malnutrition. Relying on the Business Intelligence principals, the construction of an organizational Supply Chain Management Dashboard (SCM-D), which combines data across multiple storage systems represents a new approach in a Humanitarian Supply Chain. The power of transforming raw data into meaningful and useful information, enabling more effective strategic, tactical, and operational insights represents a game changer factor in complex situations. Successful planning can be achieved by facilitating cross-functional collaboration, end-to-end supply chain visibility, advanced analytics, and executive management support. This tool will allow rapid and effective decision making based on real-time information at an aggregated level along the entire value chain.

This thesis was developed in WFP's Regional Bureau Cairo (RBC), which provides strategic guidance, policy and technical support, and operational advice to 18 countries located in the Middle East, North Africa, Central Asia and Eastern Europe. The project brings a new approach to data visualization into the region.

1.1 World Food Programme

The World Food Programme is the food assistance branch of the United Nations and largest humanitarian organization addressing the challenges of global hunger and malnutrition, in emergencies and working with communities to improve nutrition and build resilience [2].

The efforts are focused on emergency assistance, relief and rehabilitation, development aid, and special operations. Two-thirds of the work addresses conflict-affected countries where people are three times more likely to be malnourished than those living in countries without conflicts. In emergencies, WFP is often the first on the scene, providing food assistance to the victims of wars, civil conflicts, droughts, floods, earthquakes, hurricanes, crop failures, and natural disasters. When the emergency subsides, the mission is to help communities rebuild shattered lives and livelihoods, applying a development lens to

humanitarian response, in order to strengthen the resilience of people and communities affected by protracted crises [2].

WFP purchases more than two million metric tons of food every year. At least three quarters of it comes from developing countries. By buying food as close as possible to where it will be distributed, WFP can save time and money on transport costs, and help sustain local economies. Increasingly, WFP meets people's food needs through cash-based transfers which allow the people WFP serves to choose and shop for their own food locally [3].

On any given day 5,000 trucks, 20 ships and 92 planes are on the move, delivering food and other assistance to those most in need. Every year, approximately 12.6 billion rations are distributed at an estimated average cost per ration of US\$ 0.31. These numbers lie at the root of WFP's unparalleled reputation as an emergency responder; one that gets the job done quickly in the most difficult environments [2].

But despite these efforts, one in nine people worldwide still do not have enough to eat every day. WFP and its partners work to achieve the vision of a zero-hunger, food secure world by 2030. Food and food-related assistance lie at the heart of the struggle to break the cycle of hunger and poverty. In full alignment with the United Nations Sustainable Development Goals (SDGs) (Appendix 1) achieving this vision by 2030 will require not just WFP but all United Nations agencies, NGOs, and even private sector organizations to make nutritious food accessible all year round, to eliminate stunting, increase rural economic opportunity, prevent food waste, and promote sustainable agricultural development [2].

The SDGs require moving beyond saving lives to changing lives, focusing first on the people in greatest need, not just in less-developed countries but universally throughout the world.

WFP supports a common, people-centered, and needs driven approach, guided by humanitarian principles. WFP is committed to participating in humanitarian-development, joint needs assessments, combined data analysis, and planning and programming processes to deliver better results for people in need, moving beyond meeting needs to ending needs disparities.

Structurally WFP is divided into three basic organizational structures: Country Offices, Regional Bureaus, and Headquarters. Each country WFP operates in has a Country Office (CO) with its own organizational structure controlling their key activities from funding, to downstream logistics management, to beneficiary targeting. The Regional Bureaus (RB) help coordinate and support the COs' activities. There are six RBs concentrated in South America, Africa, the Middle East, and Asia. To consolidate these regional organizational activities, the Headquarters in Rome gives support to all WFP COs, establishing guidelines and policies, and helping to monitor operations at a global level. HQ is especially focused on the management of global operations at an upstream level, dealing with planning, funding, procurement, and shipping. At a downstream level, functions are predominantly decentralized, dealt with by the COs, with first line support and oversight provided by Regional Bureaus.

The organization divides support according to four types of operations: Emergency operations (EMOP), Protracted relief and recovery operations (PRRO), Country programmes and development projects (CP), and Special Operations (SO), Appendix 2.

WFP and its cooperating partners reach targeted beneficiaries via two transfer modalities: Food and Cash-Based Transfers (CBT):

- Food may be procured locally or internationally. Donations may also be received as in-kind;
- CBTs are made up of Cash and Voucher (C&V) components. Cash includes a transfer of physical currency to beneficiaries on the ground, or remotely debiting bank accounts, mobile money accounts, and prepaid cards. Vouchers come as paper vouchers or electronic vouchers (plastic cards which can be reloaded remotely). These vouchers can be exchanged at partner retailers for the commodities stipulated on the voucher.

1.2 WFP Supply Chain

WFP Supply Chain (SC) is responsible managing the entire, end-to-end processes which can be divided in three core functions:

- Planning (demand and funds forecasting, sourcing and delivery planning);
- Sourcing (procurement of commodities and supply chain services);
- Delivering (transportation, storage and distribution of food assistance).

Successful planning can be achieved only through cross-functional collaboration, end-to-end supply chain involvement, advanced analytics and tools, and executive management support. The Planning Unit (OSCP) works with RBs and COs to bring together operational units and expertise, not only within OSC, but also from other divisions, such as Programme and Donor Relations. The end goal is to provide COs with the best solutions, by using every available innovation and expertise. Given the size, scale and complexity of WFP's activities, the Planning Unit provides a range of support to HQ and field staff.

The support is given in global, regional, and country level, by planning and optimizing the end-to-end supply chain, which results in reduced lead times, increased agility and significant cost savings, while ensuring high quality and safety standards.

Empowering the supply chain boosts the scale-up of direct delivery capacity, enabling WFP to deliver better assistance to the people they serve; whether that's more diverse, nutritious products or higher purchasing power through cash-based transfers and enables local partners to deliver and strengthen national capacities.

In order to serve 80 million beneficiaries, WFP's supply chain strives to be more efficient and effective while being agile, flexible and adaptive. Emergency responses are often characterized by unpredictable demand and funding, which leads to constantly evolving supply chain parameters, infrastructure, and security challenges. Making data readily available to all stakeholders, by promoting visibility in the Supply Chain, open space for improvement and strength of WFP's core processes.

1.3 Dissertation Project

Although the structure of humanitarian supply chains is like most private sector supply chains, the humanitarian supply chain is often more unstable due to emergency contexts and unpredictable bottlenecks. As a result, coordination and management of disaster supply chains are increasingly needed and must be put in place in the humanitarian sector.

Promoting supply chain visibility in the region, is crucial to manage the current scope and complexity of the RBC Supply Chain, which involves volatile demands with peaks in rapid-onset disasters, uncertain and directed funding for programmes, infrastructure and security challenges and multiple stakeholders like donors, governments, humanitarian partners, the private sector, and beneficiaries. Understanding which processes are taking place at each stage of the SC allows mitigation of risks, forward and contingency planning and identification of best practices. Improvements in this sector would enable the organization to determine existing efficiencies and identify opportunities to optimize time, cost, and service quality.

Given the funding constraints of the humanitarian sector in recent years, WFP works to maximize the value of each dollar from the donors. Data analysis can help to make significant cost savings, and ultimately inform decisions and strategies that drive enterprise forward. The value of the data available these days comes with translating it into relevant insights.

Providing a clear view of data, in one of the most complex regions in the world, is crucial. The support tool used to bring this approach to data was the Supply Chain Management Dashboard, utilized to achieve this goal via enhanced SC visibility. Along with the graphic representations, a SC Control Board was developed and incorporated into the dashboard to visualize and flag problems, bottlenecks and opportunities.

A holistic approach was conducted to make the data simple and coherent to all viewers. In a preliminary phase, data analyses and SC diagnosis were conducted, to understand the current situation of the region in terms of demand, sourcing and delivering. Once the major inputs were evaluated and identified, a mock-up in excel was created and shared with the supply chain team to receive relevant inputs from the end-users. Tableau was the business intelligence software elected for the new RBC SC integrated platform to automatize and incorporate data live.

The SCM-D promotes integrated Supply Chain Management by facilitating collaboration amongst different working units and supporting more informed Executive Management decision making. An online platform applies the efficiency and effectiveness of the tool to all WFP operations and makes the SCM-D accessible to staff anywhere and at any time. Simplicity is key to the design with the information reflected on the SCM-D being detailed enough for a comprehensive understanding of an operation and identification of risks, challenges and opportunities; yet broad enough to provide a clear image of the bigger picture of supply chain operations in the region. The tool increases operational transparency and efficiency, value for money of funds, and ultimately supports the delivery of critical food assistance to millions of vulnerable families. All of these gains in the RBC region places WFP one step closer to achieving its goal of a world with Zero Hunger.

This dissertation is structured into five parts. Section 2 reviews the related literature on Humanitarian SC, Management and Business Intelligence. Section 3 examines the RBC's Supply Chain. Section 4 then describes the dashboard and control board created for the region. Finally, Section 5 concludes a review of some issues flagged with the use of the dashboard and describes the future work to follow.

2. Related Literature

Due to several factors, humanitarian supply chains tend to be unstable and difficult to predict. The ability to effectively manage a supply chain can emerge by exploring new approaches and best practices from Business Intelligence, regarding access and analysis of information to improve and optimize decisions and performance.

2.1 Humanitarian Supply Chain Management

A supply chain is an entire network of entities, directly or indirectly interlinked and interdependent in serving the same consumer or customer. It comprises of vendors that supply raw material, producers who convert the material into products, warehouses that store, distribution centers that deliver to the retailers, and retailers who bring the product to the ultimate user [4].

Based on this, for humanitarians, logistics is the processes and systems involved in mobilizing people, resources, skills and knowledge to help vulnerable people affected by disaster [5]. Those points can be summarized into a humanitarian supply chain. Logistics play a key role in a Humanitarian SC. It is the general manager that decides how resources are acquired, stored and transported to their destination, synchronizing the supply chain and playing a major role in inventory pre-positioning, during emergencies [6]. The mission and challenge is having the right amount of goods at the right time, getting it to the appropriate location in proper condition and delivering it to the beneficiaries in need in a manner that obtains their dignity.

Humanitarian Supply Chain Management can be defined as “The process of planning, implementing and controlling the efficient, cost-effective flow and storage of goods and materials, as well as related information, from the point of origin to the point of consumption for the purpose of alleviating the suffering of vulnerable people”, [7]. Humanitarian Supply Chain Management is desperately needed to reduce the consequences of natural disasters, epidemiologies and conflicts are enormous, not only in the short term with injuries, loss of lives, and damaged infrastructure, but also in the long term with changes in social and economic conditions. Even though the occurrence of these events could not have been avoided, the impact could have been reduced.

The main actors in a humanitarian supply chain are represented in Figure 1, [7].



Figura 1 Humanitarian Supply Chain scheme

The number of actors requiring coordination and communication for a successful supply chain represents a broad group all the way from the government to local NGOs, straight to the beneficiaries. The information about the specific needs, available resources, and social, cultural, and environmental characteristics of the disaster area are collected from secondary data analysis and community level assessments. The gathering of information is conducted by a large number of humanitarian actors and the schemas for the data sets are generally not standardized across the different actors nor are the mechanisms for sharing the data. Since 2011, the UN Office for the Coordination of Humanitarian Affairs is undertaking an initiative to build a common data exchange language – the Humanitarian Exchange Language – to address this problem [8].

Humanitarian supply chains tend to be unstable, due to political and military influence and inefficient due to lack of joint planning and inter-organizational collaboration [8]. Countries in protracted crisis situations, which are characterized by recurrent natural disasters and/or conflict, longevity of food crises, breakdown of livelihoods and insufficient institutional capacity to react to the crises, show high levels of food insecurity. On average, the proportion of people who are undernourished is almost three times as high in countries in protracted crisis as in other developing countries [9].

In the private sector, supply chains are often composed of similar activities: preparation, planning, procurement, transportation, storage, tracking, collaboration with chain partners and customs clearance. However, one of the key differences between supply chains for businesses versus the humanitarian sector is the focus [10]. In business, the focus is the final consumer, who is the input source of funds for the entire chain. In the humanitarian case, the end user rarely participates in a business transaction, having little control over supplies [11]. Humanitarian logistics differs from the logistics operations in commercial supply chains because of uncertainties in route selection, changing facility capacity, changing demand, safety issues, unused routes and other challenges like disrupted communication systems, limited availability of resources, and the need for efficient and timely delivery. It further differs on various levels due to the unique and very complex nature of disasters. While

‘regular’ SCM usually deals with a predetermined set of suppliers, manufacturing sites, business partners and stable or at least predictable demand, disaster SCM is characterized by large-scale operations, irregular demand, unusual constraints in large-scale emergencies and unreliable, or non-existent supply and transportation information—primarily unknown factors.

The integration of the supply chain is critical to the success of a global, responsive and agile humanitarian supply chain. The integration of internal capabilities and processes of organizations in the supply chain enhance the agility of the supply chain. However, the development of a more complex supply chain system to increase agility may add to the complexity of the problems encountered. Inability to manage all humanitarian eventualities at the field level dictates a focus on the most important and feasible aspects of an agile supply chain, i.e. an optimal and realistic level of complexity that reflects an adequate degree of supply chain agility. There is little time to reflect on and improve supply systems, and therefore the lessons learned from one disaster to the next are often lost [12]. Therefore, it is understandable that donors prefer their money to be spent on tangible direct relief materials rather than information systems, or even logistics equipment.

Apart from that, humanitarian supply chain management does not only deal with delivering goods, materials or information, to the point of consumption, for the purpose of alleviating the suffering of vulnerable people but also need to manage value to donors and other stakeholders [13]. Donors have control of where their funds are spent and typically already know where they want it going towards before the donation is given. They often request funds to be spent on direct materials and food, and even at a particular disaster location, rather than on crucial but indirect services such as information systems, staff training, and/or disaster preparedness [14]. The pressure to demonstrate their achievements too numerous stakeholders to ensure continuity of funding is high and dominates their actions.

The main challenge of humanitarian supply chain management is to establish a flow of donations from different sources (national and international) which are not always useful, timely, or appropriate, with minimal waste of resources. The management of a humanitarian supply chain involves the integration and coordination of a large dispersed group of experts with a view to ensuring the basic mission of humanitarian aid [5].

Several tasks need to be incorporated perfectly to consider donor requests, while still planning, implementing, and controlling an efficient, cost-effective flow and storage of goods, materials, and related information, from point of origin to the point of consumption.

Further, complicated humanitarian SCM is the nature of funding and conflicting interests of donors, benefit providers, and recipients. Investments in research, information systems, infrastructure, and other long-term projects are restricted leading to the inadequate use of technology or even non-existence of IT that is crucial for effective and efficient supply chain operations.

Due to the nature of the unknown (locations, type and size of events, politics and culture, organizations involved), the configuration of a distribution network and relationships within are challenging. Furthermore, disaster management organizations deal with (almost) zero lead time requirements in their supply chain as there may be no advance warning of a crisis, which in turn affects inventory availability, procurement and distribution. Often information is very limited at the beginning of a disaster requiring organizations to make trade-offs between speed, cost and accuracy regarding the type and quantity of goods [15].

In the private sector, the lead time heavily influences the inventory optimization success by impacting both safety stock and consumer opinion on the customer service capability. When to place the inventory replenishment order or when to place the new product order should be based in part on lead time days. In contrary to that, humanitarian agencies prioritize meeting the demand of beneficiaries, while also maximizing the prevention of further damage [16]. To support these priorities, response or lead time reduction is the major goal. Any reduction in the lead time can have a significant impact on the beneficiaries' lives, each surviving on humanitarian assistance, relying on support to feed entire families, villages and communities. A longer lead time in the supply chain risks their lives.

For any organization (profit and non-profit) effective operations require continual assessment of strategy to maintain consistency between efforts and the operating world. However, although the area of performance measurement is known to be crucial for performance improvement, research to date provides little insight into how effective performance indicators can be selected in the humanitarian context. Additionally, the development of relevant performance measurement systems would help to guide humanitarian aid actors in their decision making, help improve the effectiveness and efficiency of relief operations while increasing transparency and accountability of operations. By reflecting on the performance of humanitarian aid supply chains improvement needs could be identified easier that can be translated into concrete action steps as well as monitoring and standardization procedures.

Even though the attention to the role of logistics in the humanitarian sector has increased significantly, to date, only 20 % of humanitarian organizations measure performance consistently; 25 % declare to control a limited number of indicators and 55 % do not monitor or report any performance measurement indicators [17]. The SCM humanitarian supply chain sector prefers a practitioner-oriented performance measurement system. That allows planning and controlling supply chain by quantifying the efficiency and the effectiveness of past action. Many humanitarian supply chains have a short and unstable existence, and there appears to be an inadequate link between emergency aid and longer-term developmental aid [18]. Nevertheless, the alignment of strategy and practice with vision and mission has to be ensured internally and externally with collaborative partners to allow for a long-term orientation that leads to sustainable and successful operations.

The added value of measuring performance in the supply chain is beyond discussion in the commercial domain and many companies have been able to reap tangible benefits from this. However, in the humanitarian setting is particularly difficult due to the intangibility of services, immeasurability of the mission, unknown outcomes and the variety, interests and standards of stakeholders it is necessary to explore the applicability of such a commercial performance measurement and tracking system to the humanitarian setting first. There are various critical elements that complicate measuring performance in humanitarian supply chains, including: chaotic environments; increased complexity of performance measurement in this sector; limited information technology capacity and infrastructure [15].

In this particular Supply Chain, characterized by instability and zero lead time on the requirements needed, planning, measuring and evaluating are crucial.

2.2 Business Intelligence

Business Intelligence (BI) can be defined as a set of methods, processes, architectures, applications, and technologies that gather and transform raw data into meaningful and useful

information used to enable more effective strategic, tactical, and operational insights. BI technologies provide historical, current and predictive views of business operations, with the purpose to support better business decision making [18].

A BI software systems provide historical, current, and predictive views of business operations. Most of the data used has been gathered into a data warehouse or a data mart and occasionally working from operational data. Software elements support reporting, interactive “slice-and-dice” pivot-table analyses, visualization, and statistical data mining. Applications tackle sales, production, financial, and many other sources of business data for purposes that include business performance management. Information is often gathered about other companies in the same industry which is known as benchmarking. Essentially, Business Intelligence systems are data-driven Decision Support Systems (DSS).

Through traditional data gathering methods, users need to compile and analyze data and write related reports. This can be incredibly time-consuming, especially for small businesses that may not have the employees to do it. With a BI program, pulling the data and creating the reports at the click of a button thus freeing up time and resources allowing employees to be more productive on their own tasks. Through better strategic awareness, faster reporting decreased operating costs/lower overheads and access to better quality data and information, BI can positively influence a company’s ROI (return on investment). A BI system is an analytical tool that can provide the insight needed to make successful strategic plans for your organization. Such a system is able to identify key trends and patterns in the organization’s data and consequently make it easier to make important connections between different areas of the business that may otherwise seem unrelated, improving the visibility of these processes and make it possible to identify any areas that need improvement [19].

Currently, organizations are moving towards Operational Business Intelligence, realizing that data and content should not be considered separate aspects of information management, but instead should be managed in an integrated enterprise approach. Enterprise information management brings Business Intelligence and Enterprise Content Management together. The aim is to help business managers and other operational workers making better and more informed business decisions. Companies also use BI to cut costs, identify new business opportunities, and spot inefficient business processes ripe for re-engineering. Under this umbrella, there is the development of tools, technologies, applications and practices used to collect, integrate, analyze, and present an organization’s raw data in order to create insightful and actionable business information. BI as a discipline and as a technology-driven process is made up of several related activities, including data mining, online analytical processing and reporting [20]. Successful operation of global value chains requires that decision making at all levels can be performed in a setting where relevant information is transparent and can be accessed from any place in the value chain in real time [21].

The ability to effectively manage a supply chain has a direct impact on the organization. The increasing complexity of today’s supply chains has made it more difficult to monitor and control related tools, activities, and procedures. By achieving visibility, managers can more effectively identify and manage risks in the supply chain and respond to customer demands and other complexities in real time [22].

Several studies have identified the problems caused by a lack of information and to what extent competitive advantages can be gained from seamless supply chain information. Even though information is managed in the supply chain, there is still a challenge related to the absorption, utilization and grasping of the information. Visualising, tracking and

managing supply chains all become more complicated as firms may pursue outsourcing strategies and delivery systems become increasingly global [22].

Today, one of the most significant competitive enablers is innovative supply chain systems based on collaborative models between companies which see the needs of coordinating the supply, production and delivery processes. Thus, in order to grasp large and complex amount of information shared across the SC, there is a need for processing instruments and innovative ways to represent and visualize information. Graphically representing information in the form of pictures, maps and illustrations help clarify and easily exchange knowledge. Emphasis should be put on what to visualize, how to visualize, and to clarify the specific information elements in the holistic picture [23].

A Supply Chain Dashboard tool supports the monitoring, analysis and management of the supply chain performance. It supports decision making by visually displaying in real time leading and lagging indicators in a supply chain process perspective. Such dashboards offer support for the three application areas: monitoring, analysis and management and contains three types of indicators; performance, diagnostic and control, and allows drill down and aggregation functionality. A performance dashboard is a complete business information system that is built on a business intelligence and data integration structure. It is one of the tools utilized to achieve enhanced SC visibility and subsequent optimization. Simplicity is key to the SCM-D's design. Although not exhaustive the information reflected on the SCM-D aims to provide enough detail to allow for a comprehensive understanding of an operation and identification of risks, challenges and opportunities; whilst being broad enough to provide a clear and integrated end-to-end SC picture. Graphical representations should be leveraged to communicate information in a concise way and illustrate relevant trends and relationships. A process of continuous improvement should be applied to maximize the tool's usefulness to target users [24].

Most organizations lack the required resources to gain this visibility. Either the business lacks the technology necessary to receive real-time updates or the data is too complex for non-technical personnel to digest. Although many organizations face this challenge, emerging data visualization trends are providing real-time insight to businesses of all sizes [23].

The value of end-to-end supply chain visualizations is enable users to quickly surface insights on risks and opportunities across the global operations of an organization, supporting collaboration and decision-making by groups of experts and non-experts alike. Visualization is a powerful way to allow scientists to explore large datasets, as accurately as possible, and to present their results to a wider audience, being able to communicate complex information in by turning it into visually engaging images and stories.

The humanitarian supply chain, through an effective information infrastructure and sensitive needs assessment mechanism at the field level, would enhance supply chain agility by being very responsive to the changing needs of end users, and by being able to respond almost immediately to those changes. The agile supply chain is capable of reading and responding to real demand as it is demand-driven and activated with a "feed forward mechanism" from the field for data on actual end user requirements. The need and scope for "remote forecasting" of needs in the international donor countries would be much diminished, hence waste and costs from inaccurate forecasting and forecasting errors are reduced [25]. The humanitarian supply chain thus becomes more information-based.

There is a lot of space to disseminate the concept of Supply Chain Management in a way that convinces humanitarian donors of the importance and value of providing resources for appropriate information systems and supply chain processes as much as for tangible relief supplies [25].

Applying the Business Intelligence principles in collecting, integrating, analysis and presenting business information its possible to create a better support for business decision making in a Humanitarian Supply Chain.

3. Problem Description

The Regional Bureau of Cairo provides assistance to 18 countries in the region. WFP Supply Chain in this region represents a challenge for the organization.

3.1 RBC Humanitarian Context

In one of the most complex regions that WFP delivers help in, the challenge of bringing all the supply chain participants together, by sharing accurate data, knowledge and expertise represents an invaluable opportunity to play a game changer role.

The Regional Bureau of Cairo (RBC) provides strategic guidance, policy and technical support, and direction in three totally contrasting zones of the globe: Maghreb, Middle East and Central Asia & Eastern Europe. One of the facts that make the region of this bureau so unique and challenging is the diversity of cultures, environments and the fact that geographically the areas are so diverse, with no possibility to have a common corridor to stream the WFP assistance.

RBC provides this help to 18 countries in the areas of Middle East, North Africa, Central Asia and Eastern Europe which namely are Algeria, Armenia, Egypt, Iran, Iraq, Jordan, Kyrgyz Republic, Lebanon, Libya, Morocco, State of Palestine, Sudan, Syria, Tajikistan, Tunisia, Turkey, Ukraine and Yemen.

The region faces complex and diverse political, economic, environmental and social contexts. Among them unstable and volatile environments affected by conflict and civil unrest in countries such as Iraq, Libya, Syria and Yemen. Syria, in particular, has led to fifteen million people fleeing their homes, making this the largest refugee crisis since World War II.

Political transitions are also taking place in countries such as Egypt and Tunisia, causing periodic unrest and security concerns. In Eastern Europe, Ukraine is experiencing ongoing instability and political uncertainty. Protracted crisis persists in Palestine, Sudan and Syria, where they are exposed to recurring outbreaks of violence and conflicts, as well as sudden influxes of refugees and other population displacements.

Even some stable and relatively wealthy countries in this region are struggling with the economic slowdown, youth unemployment and vulnerability to regional instability. Chronical poverty, food insecurity and malnutrition in some middle-income countries are arising from structural barriers to food security, exemplary in countries like Armenia, Egypt, Kyrgyzstan and Tajikistan. Such countries are also vulnerable to economic shocks and global food prices, and particularly to downturns in the Russian economy.

National social protection systems are also in place in some countries but are increasingly perceived as politically and financially unsustainable. In conflict-affected

countries, including Syria, Iraq, Libya and Yemen, social protection systems have largely been disrupted, leaving millions of people with limited or no access to social assistance.

Food security is the essential component of human development and is interconnected with all other human securities. People in the Middle East and North Africa are facing shortfalls in water and food security, economic growth and job creation. Conflicts and refugee crises currently exacerbate these challenges in several countries. In other countries the high rates of urban expansion and population growth increase demand for scarce water and food, changing market patterns and provision of government services to sustain economic growth and create jobs.

The global food market is the first reliable point for most basic food items, however, as populations continue to rise, this reliance will increase, especially for the staple cereals that feature prominently in the diets of people living under the poverty line.

While domestic agriculture remains a vital part of peoples' livelihoods and food security in rural areas, its contribution to meeting national demand for food staples is shrinking. With population growth, countries are importing more of their food and becoming less dependent on domestic agriculture [26]. This dependence on international markets means all countries are exposed to fluctuations in international prices. Is it not a direct risky but can be so if the countries are not wealthy enough to protect their citizens from food price inflation that results from high international food prices.

Malnutrition can be driven by poverty, weak access to markets and services, detrimental nutrition practices and behaviors, and exposure to droughts, conflicts, and political and economic instabilities. Tends to be more prevalent where these factors are present. However, even wealthy countries have persistent nutritional challenges among vulnerable groups, which aggregated national statistics do not fully capture. Nevertheless, people living in poverty are the most food insecure as they have limited resources to buy available food and face challenges in accessing safety nets [26]. People living in poverty are also most affected by food price spikes, and in response often reduce overall food consumption, or consume less nutritious foods. Looking to the future, while food imports to richer countries will fall slightly as demand slows, poorer countries are likely to see continued growth in food demand and imports.

Disasters and food insecurity are directly interconnected. Floods, hurricanes, tsunamis and other hazards can spoil food, destroy agricultural, livestock and fishing and food processing infrastructure, assets, inputs and production capacity. They interrupt market access, trade and food supply, reduce income, deplete savings and erode livelihoods. For these reasons, resilient livelihoods are critical to the efforts of WFP to help the world's most vulnerable people achieve food security and the freedom from hunger — one of the most basic human rights [26].

For that reason, humanitarian requirements are constantly reviewed as they can change significantly between the drafting of the management plan and its adoption, especially in a region where conflicts and tensions are a close reality.

3.2 RBC Supply Chain Analysis

The organization's mandate is to save lives during emergencies, while enhancing market-based approaches to secure long-term demand for smallholder farmers' harvests. This fact requires handling with volatile demand with peaks in rapid-onset disasters, uncertain and

directed funding of programmes, infrastructure and security challenges as well as with multiple stakeholders as donors, governments, humanitarian partners, private sector and beneficiaries. These complexities require visibility into WFP’s SC to help in identifying challenges, mitigating risks and alignment of the SC.

Given the portrayed highly complex and diverse context of the region, RBC has the dual task of meeting short-term needs at an unprecedented scale by, for instance helping to manage the effects of the Syrian regional crisis, including the displacement of millions of people, while playing a development role in countries such as Egypt, Kyrgyzstan, Tajikistan and Tunisia, and supporting households, communities and governments in countries such as Sudan, which combines stable and unstable environments to promote resilient livelihoods and food security that can withstand a complexity of shocks in the longer term.

For that, WFP’s supply chain needs to manage the entire process from an end-to-end planning view, coordinating with procuring and delivering assistance. Twelve units need to coordinate their work in this Supply Chain in order to ensure sustainable food assistance.

WFP’s core supply chain is structured into three parts. The planning of demand forecasts and funds, the sourcing and delivery of food or C&V. The sourcing concentrates on the procurement of commodities and supply chain services, as well as on transportation, storage and distribution of food assistance. Figure 2 provides an overview of WFP’s high level ‘hybrid’ (food and C&V) SC process, including the main linkages with other corporate processes, [26].

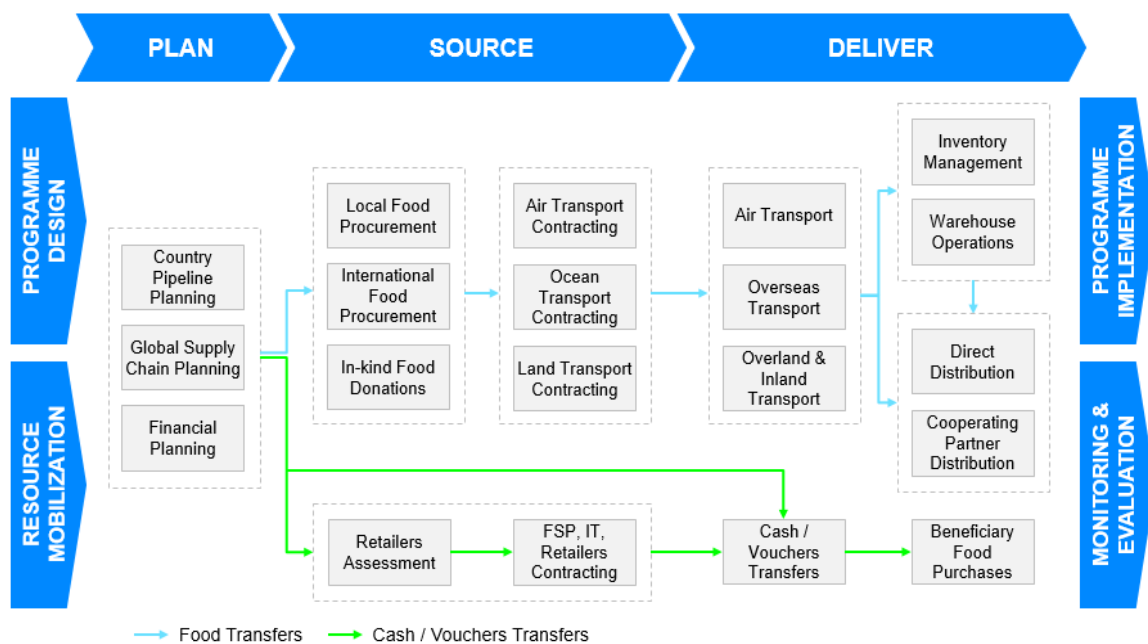


Figura 2 Summary Overview of WFP’s Supply Chain Management Process

All those players try to realize a SC that is characterized by its responsiveness, reliability, cost-efficiency and agility which are critical elements of WFP’s supply chain performance. The supply chain needs to respond fast to new requirements. It needs to predictably deliver in accordance with specific food assistance programme requirements in

the most cost-efficient way, eliminating waste and maximizing donations. A flexible switch between food, cash and voucher transfer modalities to optimally support programmes has to be possible.

Accurate and reliable data is the basis for efficient operations within any organization. It facilitates planning, reporting, monitoring and decision-making at all levels of management. As different SC units handle the same data for different purposes, the exchange, comparison and reporting from the same data becomes painful and problematic.

Therefore, increased information-sharing is crucial: the success of WFP's operations depends on coordinating with experts in resource mobilization, pipeline, programme design, sourcing and delivery operations while leveraging WFP's own facilities such as the Global Commodity Management Facility (GCMF). Collaboration in the supply chain has a wide range of forms with one common goal: to gain information and to create a transparent, visible demand pattern that paces the entire supply chain.

The SC processes run across WFP's SC units in Country Offices, Regional Bureaus, and Rome Headquarters leading to a wide dispersal of data and information (including master data, transactional data, reference data, maps, pictures, texts and graphics) which are structured and maintained in numerous application systems throughout the organization.

One of the systems used to store, track and manage all the different data needed is WINGS (WFP Information Network and Global Systems). It represents several systems integrated within WFP's Enterprise Resource Planning (ERP) system, known as SAP - Systems, Applications and Products. The SAP is the core system in WINGS which is used to manage the many facets of WFP's business, including programme/ project planning and implementation, procurement, supply chain, finance and human resources.

In WINGS, the SC is divided into several business processes. These include:

- Logistics Execution: LESS, WFP's global Supply Chain and Commodity Tracking System, monitors the progress of commodities from the time they are first requested by field offices through their handover to implementing partners. The LESS data for commodity planning, purchasing and international shipments are uploaded daily into WINGS;
- Procurement Management: Food monitoring, vendor management, food purchase orders, common procurement system, commodities tracking;
- Operational Transportation: Automated real-time tracking information, shipping instructions and data are managed within the WINGS system;
- Special Logistics: standardized processes and systems for managing UNHRD (Humanitarian Response Depot) stocks - integrated sales model for WFP and non-WFP parties.

The supply chain planning relies on this cross-information sharing, from logistics, business, strategies, tactics and so on. Regarding the amount of information that is created, the two main challenges faced in this project are related to the absorption, utilization and grasping of the information, and the exclusive use of real-time information - evident when reporting from the same data source, by different units, the figures don't match. Solving these issues daily can be incredibly time-consuming, especially for small units, with a few employees or when working under pressure of the humanitarian quotidian.

“Accurate data is the lifeblood of good policy and decision-making,” UN Secretary-António Guterres said. “Obtaining it, and sharing it across hundreds of organizations, in the

middle of a humanitarian emergency, is complicated and time-consuming, but it is absolutely crucial” [27].

To work according to António Guterres words, to effectively manage and coordinate tomorrow’s networked supply chains the development and adoption of more structured collaboration models is required - scalable approaches to enabling true data transparency and frictionless cocreation that are largely absent in today’s collaboration models.

Regardless of how much data is available, one of the best ways to discern important relationships is through advanced analysis and clear visualizations. When sophisticated analyses can be performed quickly, the results can be presented in ways that are easy to consume while allowing queries and exploration. Therefore, people across all levels of the organization can dive deeper into data and use the insights for faster, more effective decisions.

There is an urgent call for end-to-end Supply Chain integration, in WFP, to make use of all the data and knowledge that at the present moment is widely spread across various storage systems and units. This leads to an approach that will not be limited to any organizational area but instead will come up with an alignment and cross-functional team-work spirit spread throughout the organization. By consolidating and transforming data into meaningful and useful visualized information for decision support across the SC, promoting strategic alignment, cost saving, and risk mitigation, the newly developed tools are a valuable asset and will act as a game changer for WFP’s future delivery missions.

Improving how the business is run through integrating a BI framework goes beyond the technology. Key stakeholders must specify what their perception of performance is, providing the performance measures and then define achievable targets and use the tools to inform the decision-making processes. These measures are put in place to assess, measure and control the degree to which the business objectives are met, helping to explain the processes along the entire supply chain and providing a basis for how to improve those processes.

Stale data can be inaccurate data. Drawn from real-time data to delivering real-time analytics is the challenge. The access to transparent, accurate data is a prerequisite for effective supply chain collaboration and coordination. Lack of transparency is often born from a lack of trust or confidentiality issues.

Consolidating information from different sources and transforming it in meaningful data visualizations is costly, especially in the United Nations perspective, where the priority of the funds and donations is to deliver aid to the most vulnerable beneficiaries. However, WFP is aware of the cost-saving that an investment in BI can enable. Allowing quick scans of the supply chain will potentialize optimization and the savings.

Information sharing serves as an essential approach for the survival of entrepreneur developer and enabler of supply chain integration. In order to anticipate and adapt to the current and projected challenges in this complex region, the supply chain needs to adopt new tools, as well as new skills and capabilities, new corporate structures and new models for trading-partner relationships in order to target increased number of beneficiaries.

The Supply Chain Dashboard concept will serve as a basic support that will allow rapid decision making based on real-time information at an aggregated level along the entire value chain. Ensuring that all supply chain is looking at the latest information by having this tool interacting directly in real time with the source data such as an ERP will be a game changer for the organization and for the thousands of lives dependent.

To ensure integrated end-to-end Supply Chain Planning, focus is set on cross-functional collaboration across all WFP units and across all levels. It is also important to be strategically aligned with WFP's mandate and SC strategy. Seeing the full picture by connecting the dots and being holistic and informative helps to anticipate demands, leverage opportunities, and mitigate risks. Cross functional coordination also ensures that the SC is reliable, agile, cost-efficient, promoting quality and safety, and strengthening national markets. Building up integrated delivery modalities and other novel approaches also leads to a more efficient and effective SC for WFP.

Through supply chain planning, with the help of the developed dashboard, WFP aims to cut operational costs and reduce lead times, so that it can deliver better assistance to the people it serves — whether that is more diverse, nutritious products or higher purchasing power through its retail engagement strategy for cash-based transfers.

WFP has over the years tried to develop innovative solutions to continuously improve the management of the global Supply Chain. In the past, a Supply Chain Management dashboard was created but due to some corporate data structure changes and the big investment required to update the algorithm and reconstructed, this one was deactivated.

Other tool that it being developed is OPTIMUS. A tool that optimizes food basket composition and logistics routes for food procurement based on mathematical models. This will allow WFP increased flexibility in planning around dynamic project needs and funding outlooks.

These innovations encompass system development, advanced data analytics, and statistical and mathematical models. They are aimed at taking WFP's supply chain to the next level of excellence and preparing the organization for the future.

WFP's food assistance SC needs to be fast, reliable, cost-efficient, agile, and flexibly switch across transfer modalities as needed to effectively meet beneficiary needs. These goals need to be achieved in spite of challenges that increase the SC's complexity such as funding, infrastructure, security, & sudden onset disasters.

The combination of both tools will result in an integrated and high-performance supply chain that is needed in a such complex region, to reach the organization's goals in complex contexts with optimal use of resources. Bringing visibility into the SC is important and will allow better informed decision making by executive management, increased responsiveness to a dynamic emergency situation, and enhanced service delivery to beneficiaries.

4. Supply Chain Management Dashboard

An effective dashboard offers a consolidated, visual display of an organization's most critical data. By integrating data from multiple sources, it allows the user to achieve a big picture to understand key performance indicators at a glance.

The successful implementation of a dashboard is complex and requires a step-by-step process – a methodology that considers all aspects of the projects life cycle in a process allowing an effective planning, design, building and deployment of the dashboard.

In order to do so, the process of developing the dashboard was structured in different parts. The first phase consisted of developing an approach for the whole dashboard by setting boundaries and highlighting the main goal of the dashboard. Hence, the main users were identified to develop the dashboard specifically for their needs. The second stage was gathering and studying the requirements from the end users and mapping the sources of information needed. Within the last step the graphs and control boards were developed in the best way to give an answer to the users' requests using the data available.

4.1 Approach

The main goal of the project is to develop an interactive dashboard that helps ensuring an integrated end-to-end SC, anticipating demand, leveraging opportunities, and risk mitigating. Allowing different intervenients to quickly scan the SC at different stages, represents one step further to provide reliability, agility, cost-efficiency, promoting quality and safety. This dashboard will aggregate all the information needed to measure performances of different supply chain steps as well as to highlight possible weaknesses and therefore point out room for improvements.

To cover the SC in an integrated way, four main groups were identified which are going to use this dashboard the most. For that, the dashboard will be tailored exactly to the needs of these groups which consist of the procurement team, the logistics team, the retail team (C&V) and the head of SC unit, representing a top management level.

4.2 Requirements Gathering

Through promoting several brainstorm sessions with those different groups, the main points of interest were stood out to be the demand analyses, the procurement and sourcing analyses, as well as a control board for logistic details. Those three points should therefore be in the focus of this chapter.

Demand Analyses

Needless to say, that it would improve the planning if one could know the demand requirements of the beneficiaries in advance. This would lead to a more effective SC and, in consequence, better meet the requirements of people in need. This dashboard aims provide the user with the best possible analyses of the demands to equip him perfectly for every upcoming decision.

The quantity of food aid which WFP may supply is determined on the basis of: the assessed needs of the affected population, the extent of national resources the Government can reasonably be expected to mobilize, the capacity available to move and utilize emergency food aid, the response of the donors and the availability of resources and the competing demands from other emergency situations at the time, i.e. the global context.

Demand management is a key business process to effectively manage inventory in order to fulfil country office requirements. Considering the multiple determining factors and specifications of each project, WFP relies on the project pipeline management tool (PMT) to plan in a long-term and objective-oriented the annual target for forward purchasing. The information on a project's status about the planned resource requirements, the resources that are currently available and projected, and shortfalls (pipeline breaks) are compiled with the help of the pipeline.

The PMT is a standardized Excel template which collects various project data and analysis, and compiles to report on future planned requirements and potential shortfalls. The tool can be used for WFP's three transfer modalities (food, CBT, CD&A). It contains details about required rations, activities, commodities and the timeframe required. The update of the information, per project, is done at least monthly.

The PMT includes three main pieces of information that are essential for the dashboard:

- Planned requirements:

WFP has adopted two standard scenarios when reporting on a project's planned requirements, both of which are reported in the PMT: the project plan and the implementation plan, which are described in detail below.

The project plan includes planned requirements based on a scenario where the project faces no constraints (funding or otherwise). It is also sometimes referred to as the needs-based plan because it is based on the latest needs assessments.

The implementation plan, on the contrary, is derived from the project plan to reflect the constraints that effect the full implementation of the project plan. Factors such as insecurity, logistical access difficulties or - most commonly - insufficient funding often mean that full implementation of the project plan is not possible. These reductions are incorporated in the implementation plan (sometimes referred to as the operational plan). They may be reflected by reducing the number of beneficiaries targeted and/or the number of assistance days and/or the daily rations, and/or the cancellation of an activity or activities. The implementation plan will always be lower than the project plan, unless the project is fully resourced with no other constraints.

- Available resources:

The PMT also keeps track of available resources which are the sum of opened stocks, scheduled arrivals and any loans and borrowings of commodities.

- Actual transfers:

The actual transfers displayed in the PMT show the actual implementation for all months, commodities and modality transfers. Reports on actual distribution from cooperating partners are often provided to WFP with a significant delay. Until actual data is available, actual transfers should be estimated based on planned requirements and information on what was delivered to the cooperating partners. Eventually, when actual reports are received, those figures may be revised.

An important concept can be analysed from this tool: the shortfalls value. This value can easily be compute as Implementation Requeriments – Avialble Resources, representing a pipeline break that need to be fullfil.

Each Country office is responsible for developing the demand planning reports (pipeline) showing projected requirements and available resourcing for upcoming 12 to 18 months.

Procurement and Sourcing Analyses

Procurement is a business management function defined as the range and process of activities from sourcing, purchasing, negotiating and acquisition including risk management, sustainability, etc. Sourcing is the component of the Procurement process that deals with the supplier selection and the management while purchasing is a transaction-oriented function.

A set of activities compose this function, like selecting vendors, establishing payment terms, negotiating contracts, regulatory compliance and analysis and sourcing. Ensuring cooperation and integration between all is crucial.

The monitorization and tracking of the goods and services purchased will be done through the analyses of the Purchase Order reports, known as PO Food and PO Services reports. These reports will be used to track the cost/origin of commodities purchased, to give details about the vendors as well as an expected time for arrival in different points of the supply chain.

Control Board - Logistics details

The amount of reports existent in WFP and specific in logistics is massive, and, as a regional bureau, keeping track of all of it for 18 countries is a tough exercise. Therefore, a control board panel was developed that allows to keep track of the execution of activities by the staff within their control and to monitor the consequences arising from these actions.

The aim of this tool is to provide visibility from specific logistic reports in the 18 countries supported by RBC. In this way a tailored advising and assistance can be provided. To start building this model, three decisive reports are:

- Food PO report: provides an overview of the most recent cost/origin of commodities purchased and a detailed analysis of commodities handled and distributed;
- Goods & Services PO report: holds the details of this type of purchase to be evaluated per country;
- Material Document List: keeps track of the purchase date against the date inserted in the system, helps to inspect the time that it took the CO logistics team to process it;

The software selected to host and design the dashboard was Tableau which allows the production of interactive data visualization products focused on business intelligence. This operating system is the first United States-based enterprise software company to sign a master global agreement with the United Nations. The agreement establishes Tableau as a global visual analytics standard across the United Nations system and simplifies the acquisition of the technology for all United Nations-affiliated entities. This first-of-its-kind agreement allows agencies in the United Nations system — at Headquarters, in regional offices, or in country missions — to easily access Tableau’s industry-leading software.

A common requirement of the supply chain team was to have this dashboard updated in real time, with the latest available data on the system. One of WFP’s SC partners is a data expert company called Palantir. With their support, a Supply Chain Data Suite is being built, which enables the automatic conversion of the latest data from corporate systems to Tableau and others formats to be used by SC tools in development, Appendix 3.

4.3 Dashboard

Several views were designed in order to compute the ‘story’ shown to the different users. The explanation of those views is structured in the same way as the gathering of the requirements: the demand analyses, the procurement analyses and, in the end, the explanation of the control board.

Demand Analyses

For the stakeholders, it is important to understand that the needs and requirements differentiate between continents, regions, countries and governments. The developed dashboard visualizes those needs and requirements and provides them to be accessed easily and in real time.

Measuring and positioning each bureau by the total of the requirements needed for the next months and understanding the type of modality they need, gives the stakeholders a clear vision to where the capital is needed the most. This will help them to re-direct the flow of capital wisely.

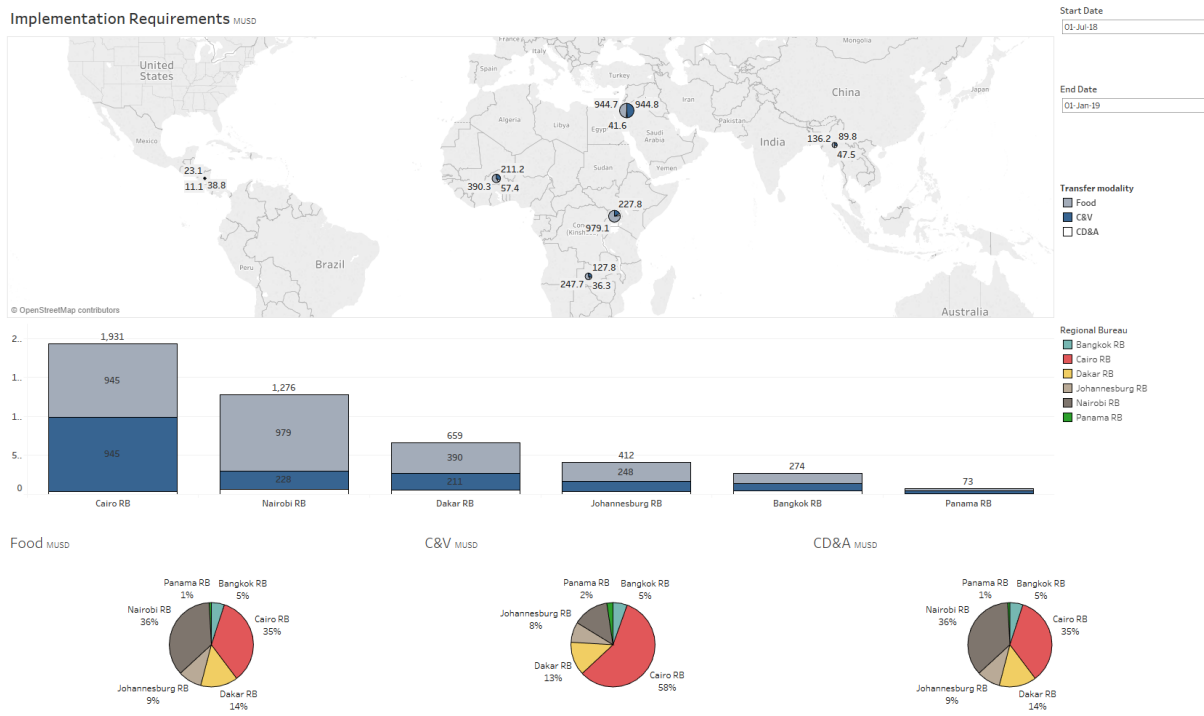


Figure 3 Implementation Requirements - World View

The view created, Figure 3, shows the required amount of help for all the regions RBC is providing assistance for. The total amount of help, showed in both, the pie charts in the world map, as well as the bar charts underneath, is split into the three transfer modalities food, C&V, and CD&A allowing to reveal the help needed with a glance. On top of that, the pie charts at the bottom sum up all the requirements divided into the specific modalities. These charts help to decide where the resources are needed most urgently, providing an easy comprehension for donors and stakeholders to contribute to this region urgency.

With the help of these charts it is easy to see that the RBC region will need 1931 M USD for the next six months (July 2018 to January 2019), which is composed of 49% of food, 49% of C&V and 1% of CD&A (info displayed when passing the mouse above the figures).

For decades, WFP has been perfecting the shipment of commodities through a carefully-constructed network of warehouses, trucks, ships and suppliers. However, with C&V operations continue to grow, especially in this region that will require 58% of the total of C&V worldwide within the next six months, those are defining 49% of the RBC activities. As the demands of the operations are changing, WFP needs to carefully-construct a network of banks, microfinance institutions, mobile money operators, and remittance companies to ensure cash assistance reaches those in need.

The same analyses can be done for the region, for single countries or for the three main zones: ‘Middle East’, ‘Maghreb’ and ‘East Europe and Central Asia’. Figure 4 shows these analyses. The bar charts at the top visualize the three different modalities needed divided per country, in the region. The composition and amount of the required help by modalities of the three main zones is accessible in the bar charts underneath.

Implementation Requirements - RBC Region MUSD

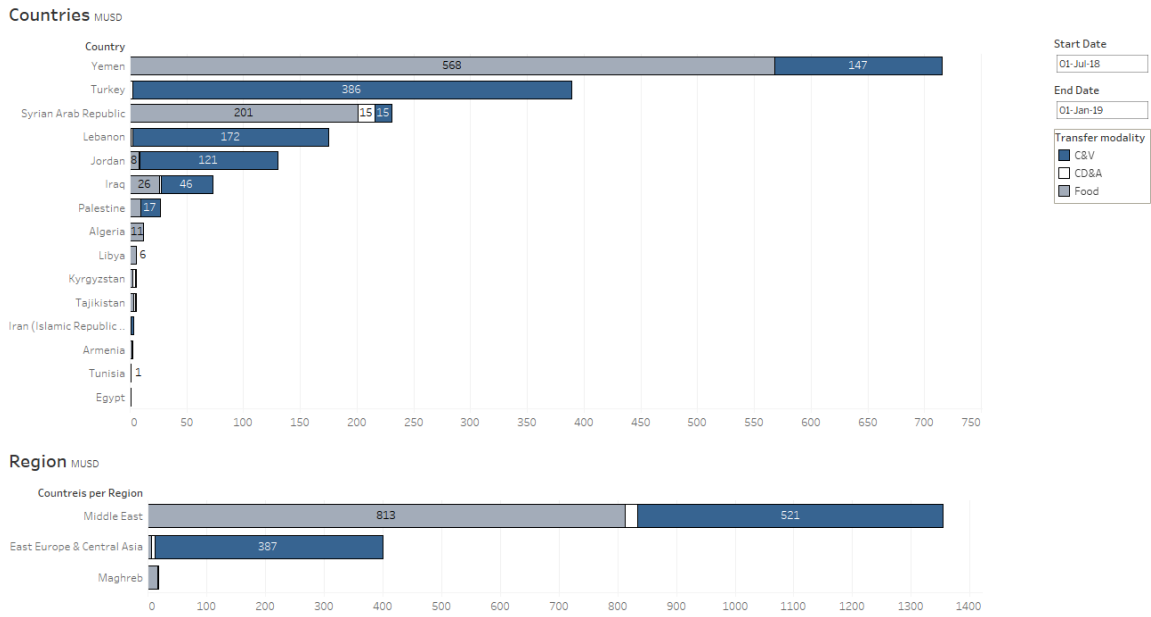


Figura 4 Implementation Requirements - Region View

The dashboard visualizes that the middle east, out of the three main zones, accounts the biggest needs. Leading reasons for that are two of the biggest crises: Yemen and Syria. Interesting outcomes of this graph are Turkey and Lebanon, positioned in second and fourth position respectively. These surprisingly high positions can be justified by the number of Syrian refugees allocated in these countries, which consequently raised the amount of help required. Turkey currently hosts the highest number of refugees in the world: 3.9 million people, of which 3.5 million are from Syria. Where in Lebanon they represent 20% of the total population in the country.

Since the major needs may not be related just with emergency operations, it is essential to be able to quickly scan the potential countries of risk in the future. Figure 5 aims to provide the information needed for that.

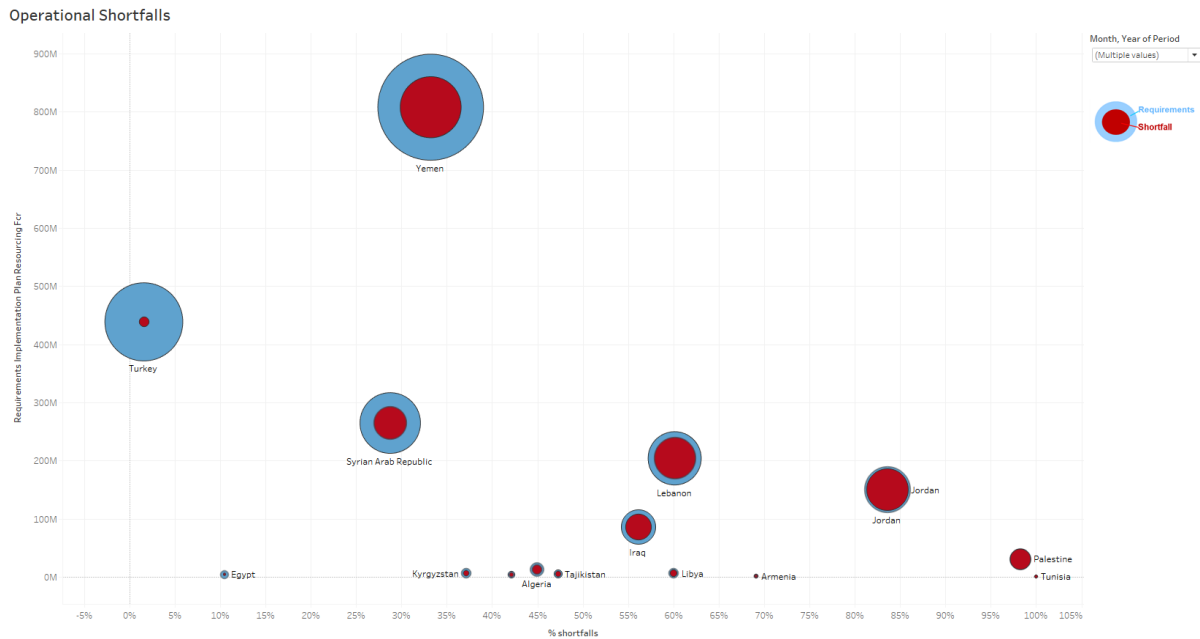


Figura 5 Operational Shortfalls

In this bubble chart, the blue circle represents the implementation requirements while the red one stands for the shortfalls, both proportionally to their particular USD value. The x axis presents the percentage of shortfalls (USD shortfalls against USD of implementation requirements, per country) while the y axis displays the value of implementation requirements. This means that the countries on the right side of the graph will present a bigger percentage of shortfalls while the countries in the upper side will present the biggest value of implementation requirements.

In the point of view of a risk analyses, the countries positioned in the upper right corner should be focused on and alert for deeper analyses.

One of the surprising outcome of this representation was the size of Lebanon compared to Syria. It wasn't expected that both showed almost the same requirements circle size, due to Syria facing one of the biggest crises in the world right now. For several facts already explored before, this risk analyses are indicative to the stakeholders, that focus should be set on all the countries, even outside of the "public eye".

The aim of the dashboard is to assist each country regardless the level of SC complexity and level of emergency. The use of this tool can be a plus in big operations, using it for smaller operations and countries with less 'public highlight', it can be a game changer by reducing costs and improving the SC.

In a country perspective the focus is to understand how the pipeline is distributed in terms of distribution activities planned, until when the requirements are covered and where a pipeline break (shortfall) will occur. In the dashboard for the country's view, these three main aspects are represented, as shown in Figure 6.

Implementation Requirements - Syrian Arab Republic MUSO



Figura 6 Implementation Requirements - Country view

The pie chart on the left shows the implementation requirements divided per type of modality, while the bar chart on the right shows each planned activity. In the case of Syria, the biggest amount planned will be applied for General Food Distribution (GFD) within the next six months.

In the two lower bar charts the pipeline is broken down in Food and C&V projections. The light blue line stands for the desired supply with either food or C&V which is derived from the project plan. Taking factors such as insecurity or insufficient funding into account, the dark blue line shows the implementation requirements that should be fulfilled. The red line represents the amount resourced so far, as a result of the green bars evaluation (expected supply availability). Comparing the implementation requirements with the resourced line, it is easy to detect when the pipeline will not be covered, identifying the future shortfalls.

In Syria’s case, in terms of food (in MT), the pipeline needs are covered until September 2018 and from that onward, there will be a pipeline break (shortfalls). These two graphs allow a quick scan of the future needs to be used as an indicator to prepare ahead and engage with the procurement, budget and donors to work together in order to fulfil the future gap.

Procurement and Sourcing Analyses

In order to map the procurement sources and origins per country, four main graphs were created: “MT received by Origin”, “MT received by Procurement type”, “MT received by VC” and “Country as shop”. These graphs are shown in Figure 7.

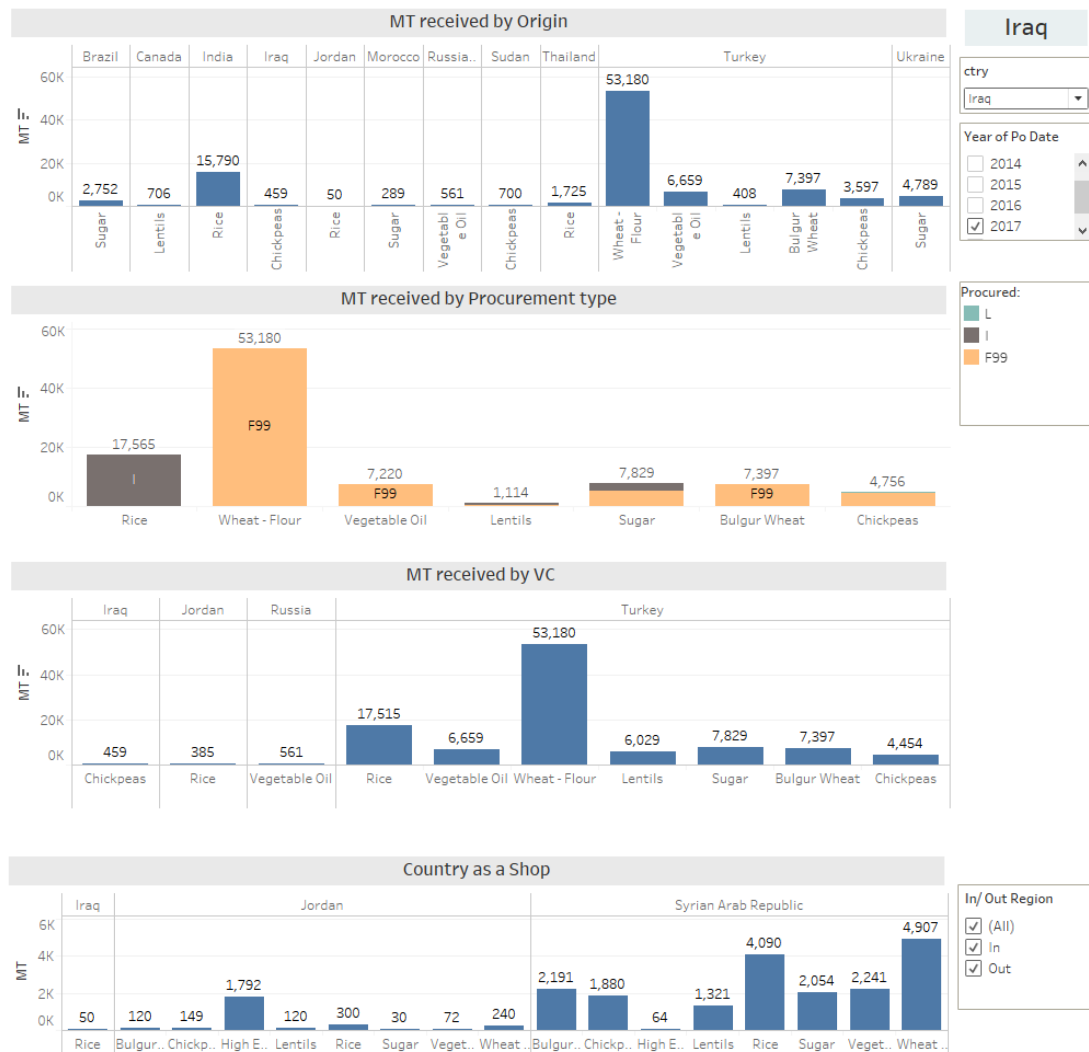


Figura 7 Procurement Overview

The first graph “MT received by Origin”, makes it possible to see for the selected country which commodities in which quantity (in metric tons) were bought from which origin country in the selected period of time.

The second graph “MT received per Procurement type” represents a consolidation per commodity, of the type of procurement done. The type of procurement can be divided by:

- L (Local), commodity procured by the receipt country, bought internally;
- EG5 (RBC), commodity procured by the bureau from a country in RBC region;
- F99 (HQ), commodity procured by headquarters from a country in RBC region;
- R (Regional) commodity procured in the region by other country;
- I (International) commodity procured by headquarters from a country outside of the region.

This consolidation allows to get the full picture of the different procurement participants in the country, leveraging some potential opportunities in terms of work load for the bureau. One of the strategies created by RBC for the following years, is to start procuring more in the region and for the region increasing the bureau procurement workflow and consequent capacity. In the case of Iraq, six of the seven commodities bought in 2017 were procured by HQ in countries in the RBC region. These facts expose Iraq as a new target to leverage RBC procurement action.

In the third graph, “MT received by VC”, the same analyses as the first one is done, but now the origin country was swapped by Vendor Country (VC). Origin country stands for the country where the commodity is produced while vendor country is the country where the commodity was bought. For example, the rice from Origin Country Thailand, in fact was bought in Turkey. This shows from where the commodities are sourced and where the last stop of the commodity was before being bought.

The last graph, “Country as Shop” represents the commodities that were bought in the country. In this case, Syria and Jordan, in 2017 bought different commodities in Iraq. Additionally, a filter “IN/OUT Region” was created which allows to understand which countries belonging to the same region are buying from the selected country and shows the capacity available for other countries to prioritize the regional procurement against other countries outside of the region.

Aligned with the new bureau procurement strategy, a consolidated analysis is shown in the following graph, Figure 8.

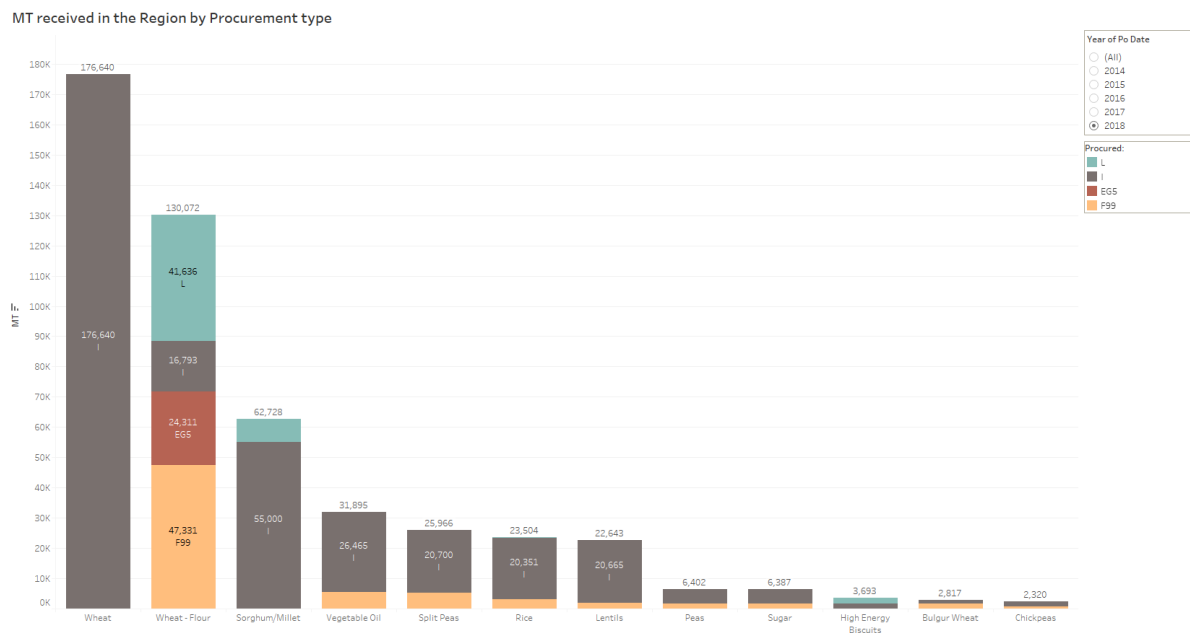


Figure 8 Regional Procurement Aggregation

Mapping the commodities and quantities bought by HQ (F99) represents the future work load that RBC (EG5) can assume. On the other hand, the amount of international procurement can be evaluated, together with the previous view, to help structuring a strategy focused in regional/ local sourcing potential.

To better understand the main countries where the commodities are produced, Figure x was created.

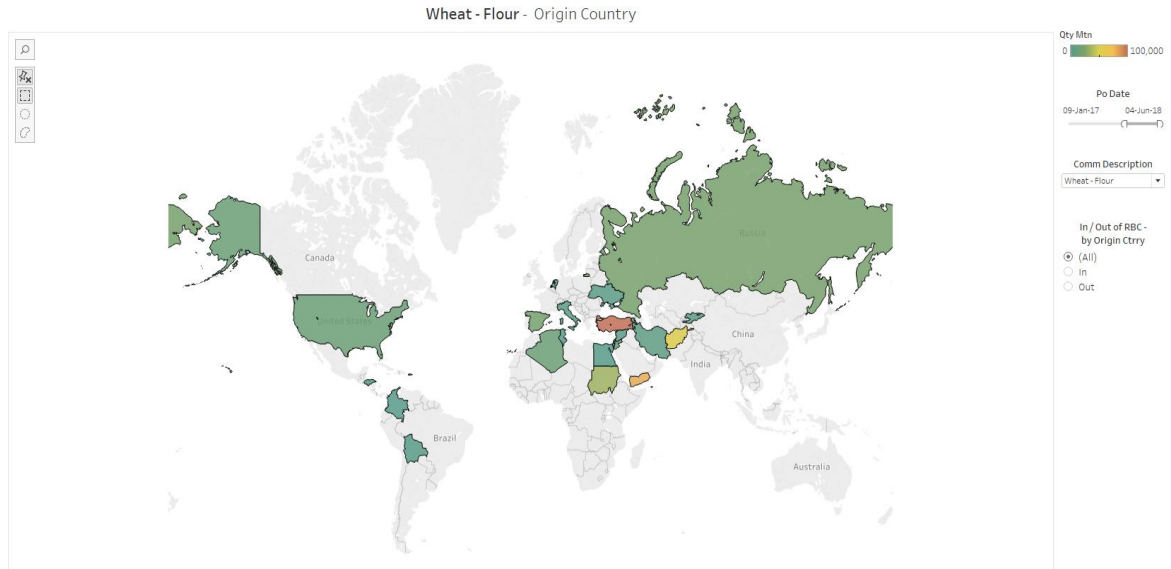


Figura 9 Sourcing Map

With the help of this map it is possible to see, for each selected commodity, from where it is produced (origin country), with a range of indicative colours (from green to orange) representing capacity in metric tons (MT).

These three views presented compile the big picture of procurement in the region, allowing an integrated analysis of the procurement of the bureau, flagging quickly potential new sources and capacities in the region, that will help giving a new guidance to the strategy for the region.

Control Board - Logistics details

In the Purchase Order Food report (PO food), different expected dates are established to be met along the supply chain. Three important dates are defined as: “Ship to”, “RTA disch” and “GR doc date”. The first one corresponds to the maximum date until that the supplier should ship the commodity. The second one represents the maximum date for a commodity to arrive at the discharge point. And last one, the “GR doc. Date” represents the actual arrival date of the commodity, which may happen, before or after “Ship to” and “RTA disch.”, Figure 10.



Figura 10 Purchase Order Details

As soon as a commodity is bought, a ship tolerance range is created. This period (Ship from – Ship to) should be met by the supplier as the commodity should be shipped before the “Ship to” date. In addition to that, the “RTA disch” represents the requested time of arrival of the commodity at the discharge point. This is also the limiting date to receive the good in the last point of discharge, in the supply chain. These two parameters, the “Ship to” and the “RTA disch”, are fixed a priori by the procurement team. The positioning of the “GR doc date” against these two dates, will be used to evaluate the procurement efficiency job and the commitment of the supplier meeting deal lines.

Several different items (PO No. item) can be purchased within the same purchase order (PO No.) requested by a specific procurement entity PGR (purchase group request). Each PO No. item can have a different GR doc date, meaning that each item of the purchase order was received on different days, but will have the same “RTA disch” and “Ship to” under the same PO. Number.

Comparing the “GR doc date” against the “Ship to”, the supplier capacity to meet the requested date is evaluated, for each item supplied (PO item). This evaluation can be categorized in “Late arrival” if “Ship to” < “GR doc date”, “On time” if “Ship to” = “GR doc date” and “Early arrival” if “Ship to” > “GR doc date”.

In addition to that, by comparing “GR doc date” to “RTA disch”, the scope of the procurement team in working to meet the requested date for the arrival of the good, can be evaluated. This evaluation can be categorized in “Late arrival” if “RTA disch” < “GR doc date”, “On time” if “RTA disch” = “GR doc date” and “Early arrival” if “RTA disch” > “GR doc date”. For both measures and per recipient country, the number of PO items, the average of days and the quantity and metric tons are displayed in two summary tables, Figure 11.

Syrian Arab Republic - RTA/ Ship to vs GR

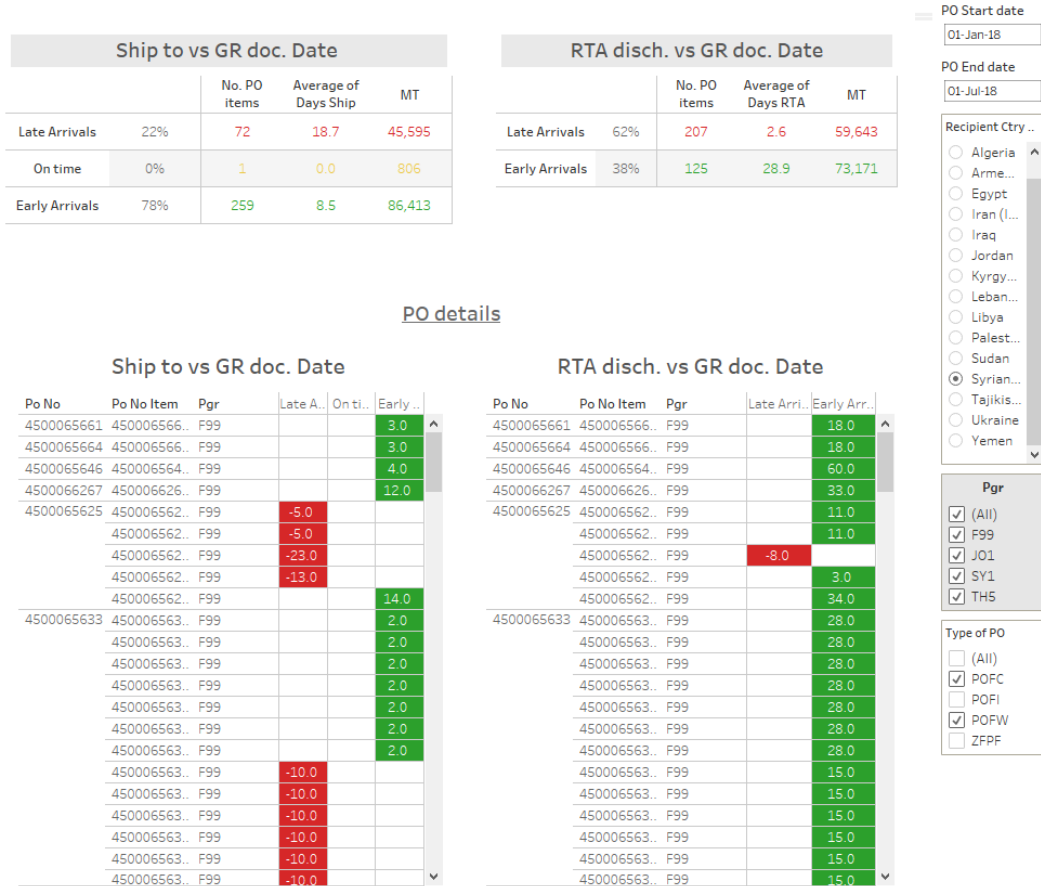


Figura 11 RTA/ Ship to vs Gr. Doc Date

The details of the purchase order (PO) can also be accessed easily through the display of a more complete table, allowing to dig into more specific details, if needed. In addition, a filter “PGR” was added, allowing to see and understand the Purchase Group Requested responsible for the different POs procured.

Concerning the group of vendors, working as a supplier of each country, it is critical to understand which ones the major players are and if there is any monopoly that should be investigated. To do so, a Vendor Share control board was created. In this dashboard, the list of suppliers, in the period selected, is displayed, along with the respective percentage of value paid. In order to enable an easier visualization, a traffic light range was designed, displaying green light if the supplier represents less or equal to 10% of the total USD value, yellow in between of 10% and 20%, orange in between of 20% and 30%, and red if superior or equal to 30%, Figure 12.

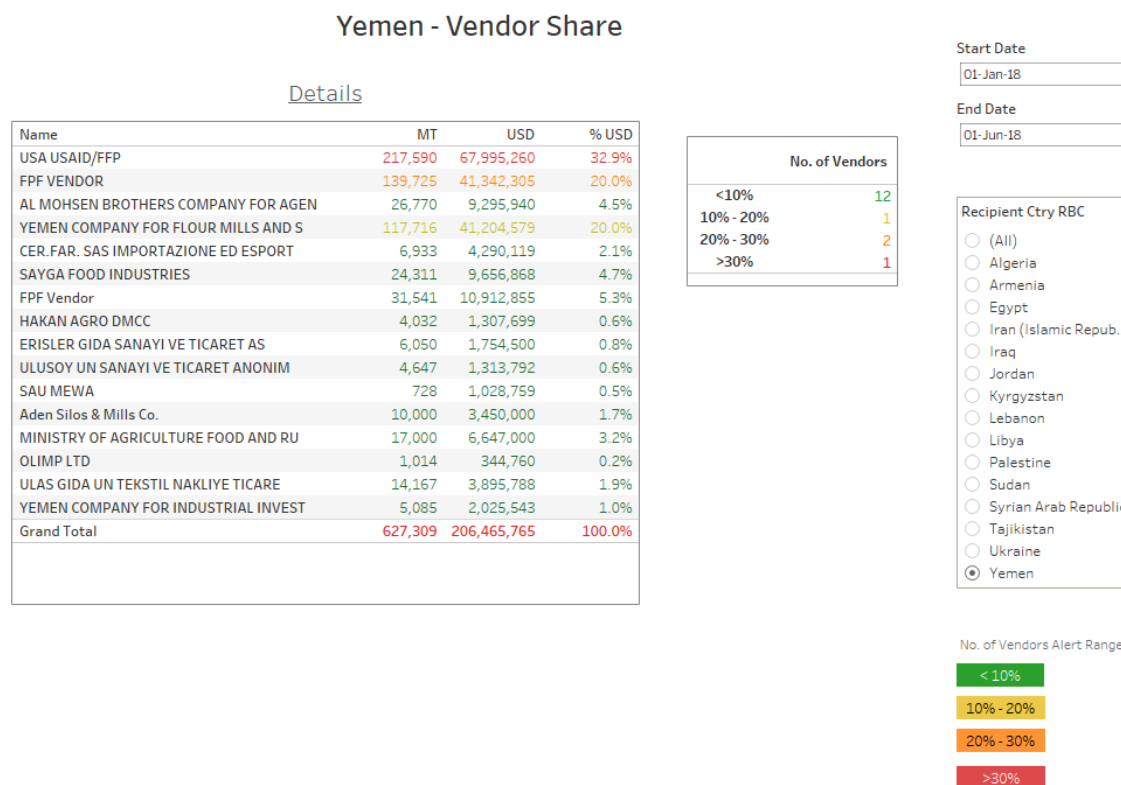


Figura 12 Vendor Share

In the case of Yemen, it is possible to see that there are ten suppliers that represent less than 10% each, one that represents 24% of the total, and one that accounts to 38%, assigned in red. In this case, a deeper analysis should be carried out to understand which kind of commodities are bought from these suppliers and which prices are payed to compare it with other options in the market.

Due to the unstable environments at places that WFP delivers help in, the centralization of the commodities needed in a few suppliers represents a major risk. Monopolies should be carefully analysed and other options in the market should be evaluated.

It is not just food that WFP needs to purchase. Several other goods and services need to be provided to complete all the assistance required. As so, procuring and purchasing goods and services represents an important assignment.

For Goods and Services, the type of procurement can be divided in waivers and competitions. The procurement policy of WFP is competition. Competition is met if at least three suppliers are invited to submit quotations / bids / proposals, regardless of how many offers are received. But, in some cases, competition may be waived due to some reasons, such as when the requirements of emergency operations, or other operational needs, do not permit the delay attendant on the execution of a competitive process; when only one source can reasonably meet WFP's requirements or the procurement relates to perishable supplies; when competition for identical items has been obtained during the preceding three months, unless there has been a substantial change in price or market trends in the meantime.

Five types of purchase orders, under this category, can be done: Purchase Order non-food competitive (PONF), Purchase Order non-food waived (PONW), Purchase Order

Services (POS), Purchase Order services waived (POSW) and ZNIT (Internal Purchase). If the value of the purchase order competitive is bigger than 200.000 USD or the value of the purchase order waived is bigger than 100.000 USD the approval of the regional procurement office (RBC procurement team) is required before a CO releases a tender.

To enable a quick historical examination of this type of procurement per country, a control board was settled. This dashboard was designed in a way to consolidate all the types of procurement released by the country, in a period of time, and showing the work load that went through RBC’s approval, Figure 13.

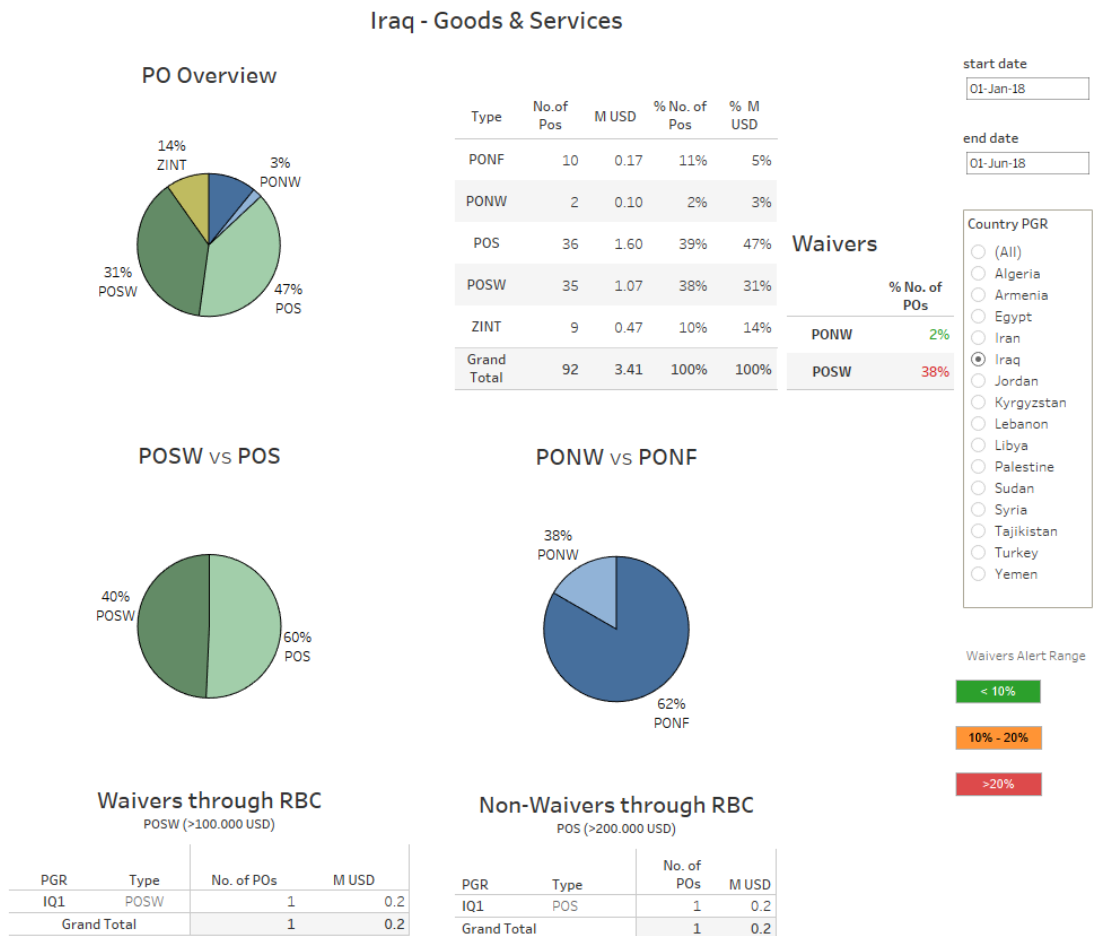


Figura 13 Goods and Services

The traffic light warning signal was designed in a way to keep track of the number of waivers performed by the country in that period. In this case, if the total number of PONW or POSW is inferior to 10%, the signal displays a green, if it is in between of 10% and 20% an orange, and equal or superior to 20% a red alert.

This control panel allows each country to keep track on the total numbers and values of the type of procurement done for goods and services and helps the regional bureau to give a tailored support on it.

All the previous analyses related to purchase orders, are only possible once the reports are inserted in the system. Due to this manual process, it is important to study the interval

range in between the document date of the good received against the date of entry in the system of that document.

Therefore, a control panel was designed, where the difference between the entry date of the document in the system and the date of the document (when is received) was calculated for each PO number. Figure 14 shows this panel.

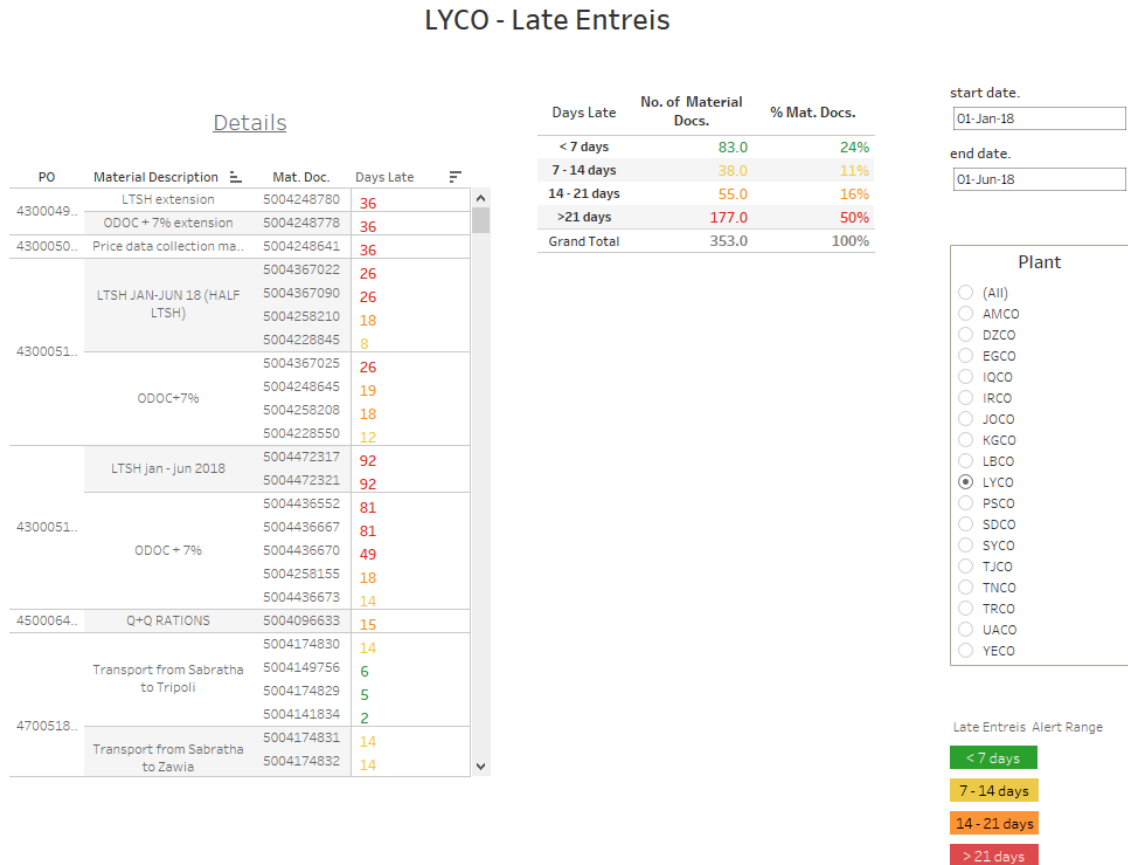


Figura 14 Late Entries

Late entry was considered when entry date > date of the document and on time when entry date =date of the document. The traffic lights warning was created based on the number of days that fits inside four categories: if it is less than seven days old, it displays green, if it is in between of seven and 14 days, then a yellow, if it is in between of 14 and 21, then an orange and if equal or superior to 21, a red alert. This system will help the country and the regional bureau to keep an eye on the work flow and the time it takes to get the required documents into the system. The warning signals will improve the whole processes flow in between activities that rely on these documents as they will be inserted quicker into the system.

To RBC’s users taking the best advantage of the tool, a guideline manual was compiled, providing insights of the dashboard graphs, filters, data sources and possible analyses and conclusions to take, Appendix 4.

The panel of dashboards and control boards together form the RBC - Supply Chain Management Dashboard. An internal tool developed that aggregates information used by different business units such as Programme, Budgeting and Allocation, Donor Relations, Procurement, and Logistics in WFP Country Offices and Regional Bureaus. Created to live up the user needs and expectations, this tool adds value to the optimization of the SC via enhanced SC visibility.

Conclusion

A performance dashboard is more than a screen with performance graphics on it: it is a complete business information system that is built on a business intelligence and data integration structure. A performance dashboard is very different from plain dashboards or scorecards. The latter are simply visual display mechanisms to deliver performance information in a user-friendly way, whereas performance dashboards knit together the data and rules that drive what users see on their screens.

Supply chain visibility is a key business challenge. The ability to effectively manage a supply chain has a direct impact on the organization's bottom line. The increasing complexity of today's supply chains has made it more difficult to monitor and control related tools, activities, and procedures. By achieving visibility, managers can more effectively identify and manage risks in the supply chain and respond to customer demands and other complexities in real time.

The dashboard built helps to identify some future problems, form pipeline breaks, delays in the delivery across the supply chain, the future requirements that need to be attend, highlight of funds spend in several areas and different strategy opportunities to improve. The future concerns highlighted in this project were all spotted in countries in the Middle East region. Empowering supply chain users with a powerful tool that allows a quick scan of the situation and potentialize decision making, will help WFP to plan and deliver food aims. In a region where the hunger is one of the most used "weapons", the impact of better planning ahead has a direct influence in the beneficiaries in need and consequently in all of the refugees recipient countries.

The pressure to demonstrate Supply Chain Management achievements to numerous stakeholders, to ensure continuity of funding and support, is high and dominates their actions. The tool created does not only provide information that is beneficial within WFP organization. When shared through external report analyses, the suppliers can see how they are measuring up and work to improve troubled areas, thereby improving the overall performance of the supply chain. For example: tracking the delay in PO acknowledgement by suppliers or delays in invoicing due to errors helps both buyers and suppliers to proactively look at and resolve this.

Supply chain cost reduction can be driven by the data to consolidate suppliers and negotiate procurement contracts company wide. By effectively utilizing their procurement data across all departments, a supply chain analysis can compare product spend across suppliers while analyzing their percentage of contract spend. Procurement can isolate expensive suppliers and negotiate contracts much more effectively by consolidating suppliers.

Savings opportunities can be identified when looking at the minimum price paid and last price paid and comparing it to quantity.

More than 30 data sources were identified as crucial to bring visibility on it. Once the linkage to all of these sources, from the source to the dashboard software, will be done, other complementary analyses will be explored, providing the user with a continuous improvement of the full picture of the SC. When the new live connections will be available, a set of new requirements will be analyzed and prioritized to improve the tool functionality. The dashboard created will be used as a starting model for the other five WFP bureaus, where new inputs and outcomes will be jointly developed.

Tableau was the software used to host and design this dashboard, however, and regarding the amount of data used so far and the future work plan, the possibility to migrate to another platform is being studied.

Information is valuable if it is possible to make positive changes based on it. This means that a bigger investment will be required to build the corporate environment where data can be turned into constructive knowledge in a broad way, but the real benefit occurs when that knowledge is actionable. Delivering actionable knowledge is one thing, but to take the proper action requires individuals empowered to take that action. And despite the costs, the senior managers must be convinced that the investment will yield results. Therefore, it is in the best interests of the organization to consider the types of costs inherent in developing a BI platform for comparison with the anticipated benefits.

To encourage internal efficiencies in WFP processes as well as to identify areas for improvement, Key Performance Indicators are being outlined and will eventually be tracked across the Supply Chain. In the future, these indicators may be incorporated into the Supply Chain dashboard to couple SC optimization with SC operational performance. The WFP is actively working towards increasing its supply chain capacity and efficiency of operations. Additionally, the development of relevant performance measurement systems would help to guide humanitarian aid actors in their decision making, help to improve the effectiveness and efficiency of relief operations while increasing transparency and accountability of operations.

Improving the way the business is run as a result of integrating a BI framework goes beyond the technology and must be a shared commitment from the whole organization, where WFP stakeholders must specify what their perception of "performance" is, and help developing and implementing new approaches.

References

- [1] <https://www.cbsnews.com/news/war-and-hunger-syrian-refugees-in-jordan-60-minutes/>
- [2] WFP overview. (16th of April 2018) Retrieved from: <http://www1.wfp.org/overview>
- [3] WFP Procurement. (16th of April 2018) Retrieved from: <http://www.wfp.org/procurement/>
- [4] <http://www.businessdictionary.com/definition/supply-chain.html>
- [5] Van Wassenhove, L. N. (2006). Blackett memorial lecture. Humanitarian aid logistics: Supply chain management in high gear. *Journal of the Operational Research Society*, 57(5), 475–489
- [6] Humanitarian Logistics by Rolando M. Tomasini, , L. N. van Wassenhove, , and Luk Van Wassenhove
- [7] S. Thomas; From Logistics to Supply Chain management: The path forward in the humanitarian sector; Fitz Institute (2005)
- [8] Doktorgrades, Erlangung. Towards an online OR toolkit for humanitarian logistics.
- [9] FAO, Resistance for livelihoods – disaster risk reduction for food and nutrition security
- [10] R. Bhatnagar; Role of logistics in enhancing competitive advantage: A value chain framework for global supply chains; *International Journal of Physical Distribution & Logistics Management* (2009)
- [11] S.A. Torabi; A novel procurement model for humanitarian relief supply chains; University of Tehran, Tehran (2012)
- [12] S. Argollo da Costa, V. Campos, R. Bandeira; Supply Chains in Humanitarian Operations: Cases and Analysis (2012)
- [13] Klumpp, Matthias. Leeuw, Sander. Humanitarian Logistics and Sustainability
- [14] A. Mohamed; Supply chain management practices and their impact on performance among humanitarian organizations in kenya (2010)
- [15] Oloruntoba, R., & Gray; Humanitarian aid: An agile supply chain? *Supply Chain Management: An International Journal*
- [16] M. Christopher; Logistics & Supply Chain Management: Strategies for Reducing Costs and Improving Services; Pitman Publishing, London (1998)
- [17] Klumpp, Matthias. Leeuw, Sander. Humanitarian Logistics and Sustainability
- [18] <https://www.maximizer.com/blog/7-reasons-why-business-intelligence-is-vital-to-business-success/>
- [19] J. Olhager, F. Persson; *Advances in Production Management Systems*, Springer (2007)
- [20] <https://financesonline.com/purpose-business-intelligence-business/>
- [21] Strandhagen, Jan; Alfnes, Erlend; Supply Chain Control Dashboards
- [22] Hoinkes, Rodney; *Visualizing Design Processes for Knowledge Mapping* (1996)
- [23] https://www.sas.com/en_us/insights/big-data/data-visualization.html
- [24] B. Sithole, S. G. Silva, M. Kavelj; Supply Chain Optimization: Enhancing End-to-End Visibility; *Procedia Engineering* (2016)
- [25] Richard Oloruntoba, Richard Gray, *Supply Chain Management: An International Journal*

Appendix 1 - United Nations Sustainable Development Goals

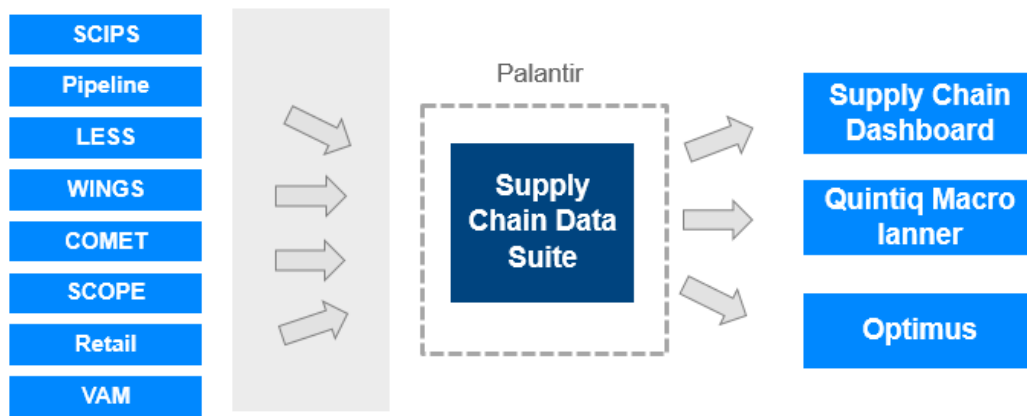


Appendix 2 - WFP Emergency Types and Levels

Operation type	Description	Duration
Emergency operations (EMOP)	Food assistance to meet emergencies such as: Sudden disasters/calamities (e.g. earthquakes, floods...) Refugees influxes, displacement of populations	Between 3 and 12 months
Protracted relief and recovery operations (PRRO)	When an EMOP is not enough to stabilize the area and continuous assistance is further needed	Between 2 to 3 years
Country programmes/ development projects (CP)	Rehabilitation and disaster preparedness projects Technical assistance to help developing countries establish/improve food programs.	5 years
Special operations	Short-term operations. Usually complement	Variable

- I Emergency operations managed primarily within country response capability, some Regional Bureaux (RB) and Headquarter (HQ) support
- II Emergency operations requiring regional response capability, managed by the RB with some HQ support
- III Emergency operations requiring global corporate response capability (corporate emergency) where there is a clear mandate for the HQ to engage directly

Appendix 3 - WFP Supply Chain Data Suite Scheme



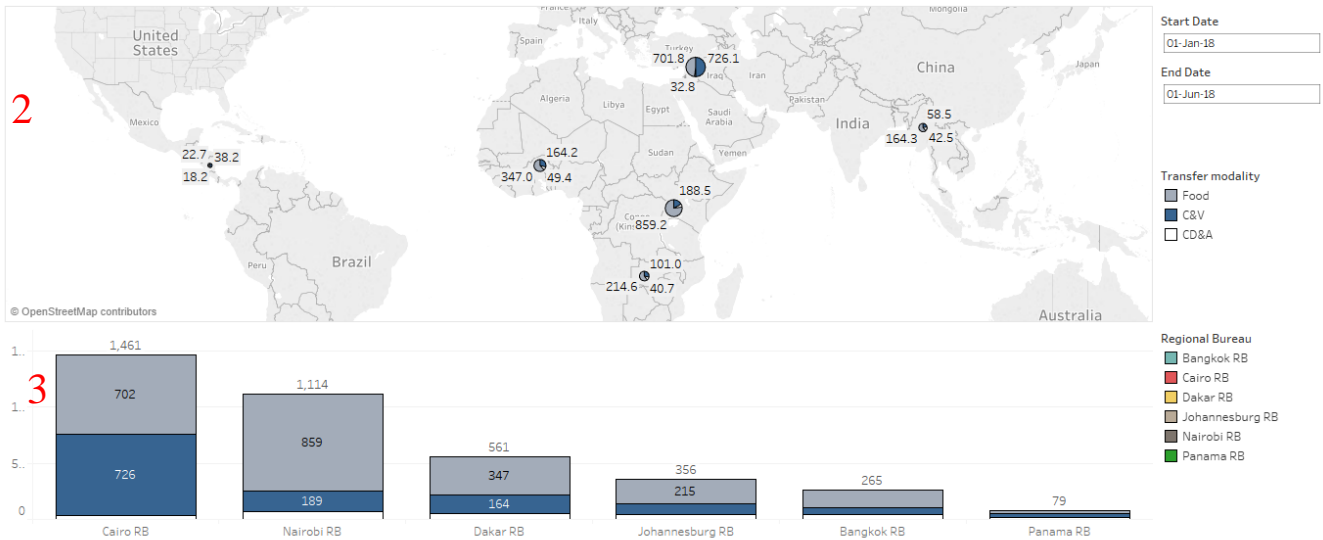
Appendix 4 - Dashboard Guidelines Manual

Guideline – RBC Supply Chain Dashboard

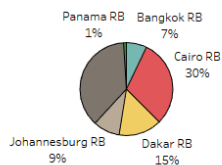
1. Implementation Requirements – World M USD (data source: Pipeline)

1. Geographical distribution of the Implementation requirements per Regional Bureau for the three types of modalities: Food, CBT and CD&A (proportional pie chart size);
2. Implementation requirements per Regional Bureau for the three types of modalities and total value;
3. For the three types of modalities, percentage of implementation requirements of each bureau.

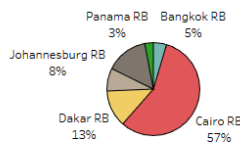
Implementation Requirements M USD



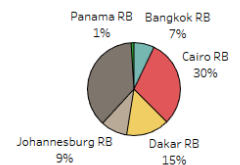
Food M USD



CBT M USD



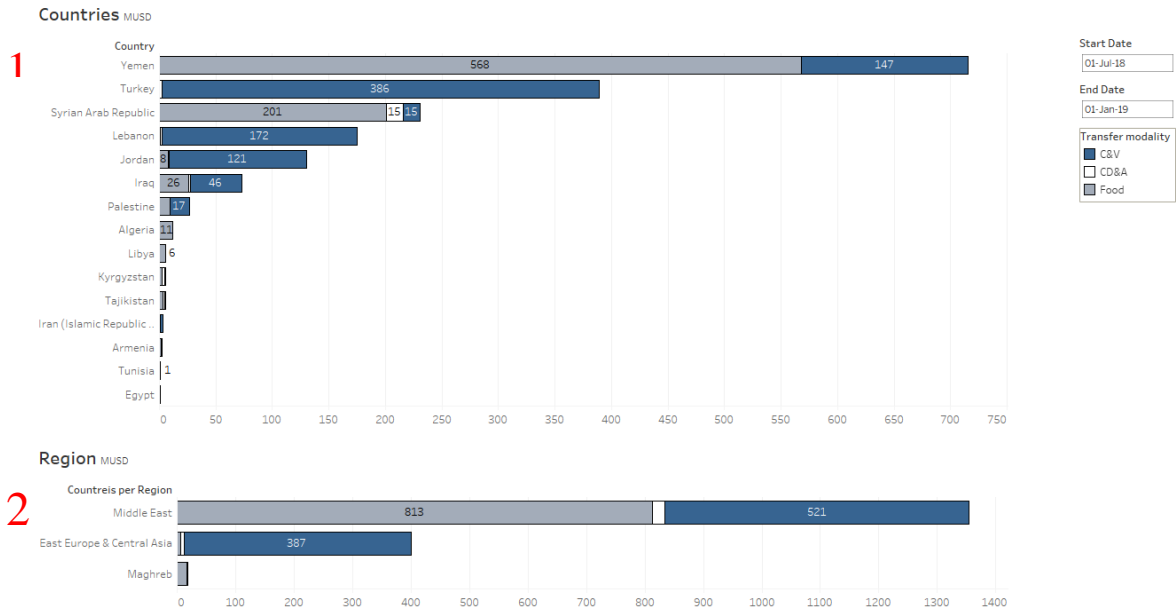
CD&A M USD



2. Implementation Requirements – Region M USD (data source: Pipeline)

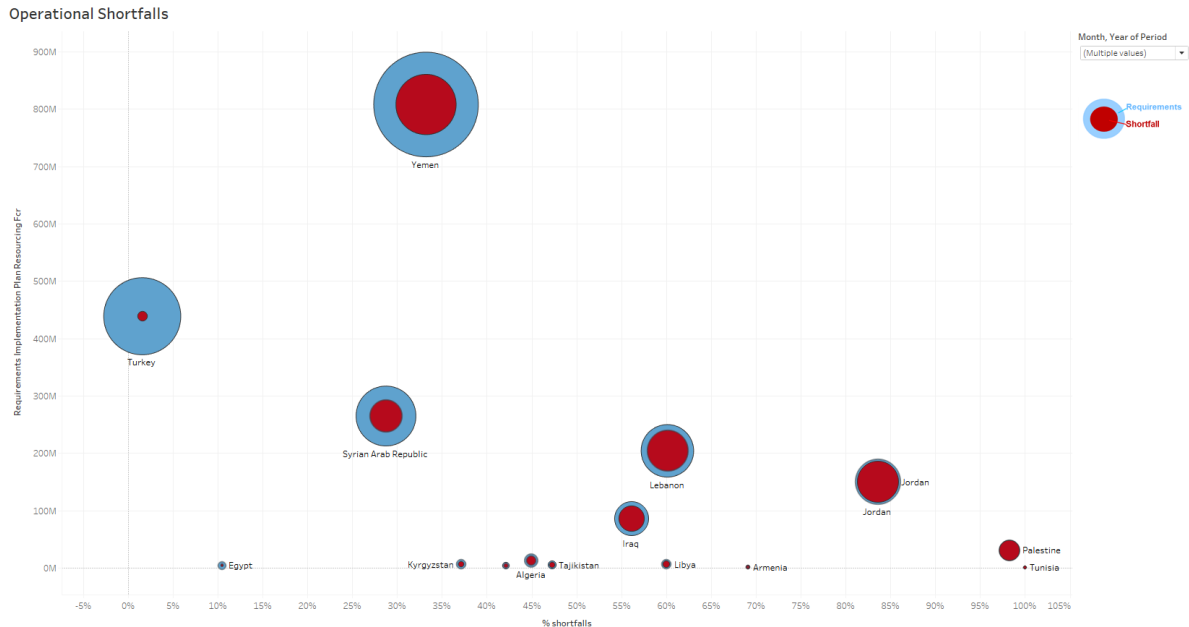
1. Implementation requirements for all RBC countries per modality type;
2. Implementation requirements for the 3 main RBC regions (Middle East, Maghreb, East Europe & Central Asia) per modality type.

Implementation Requirements - RBC Region MUSD



3. Operational Shortfalls – Region

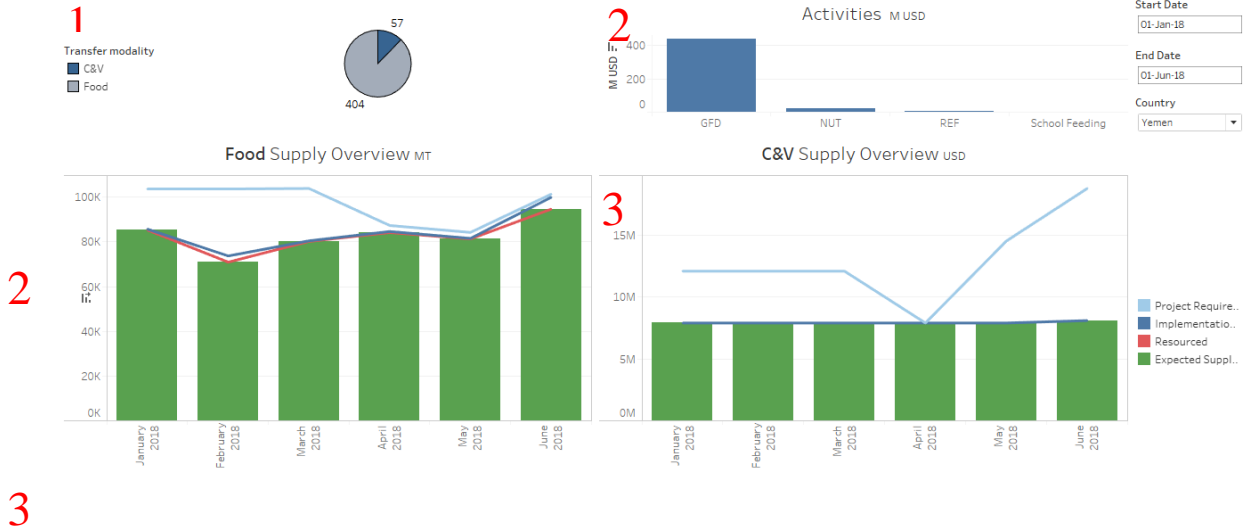
Comparing the size of the implementation requirements with size of the shortfall, per country – risk analyses.



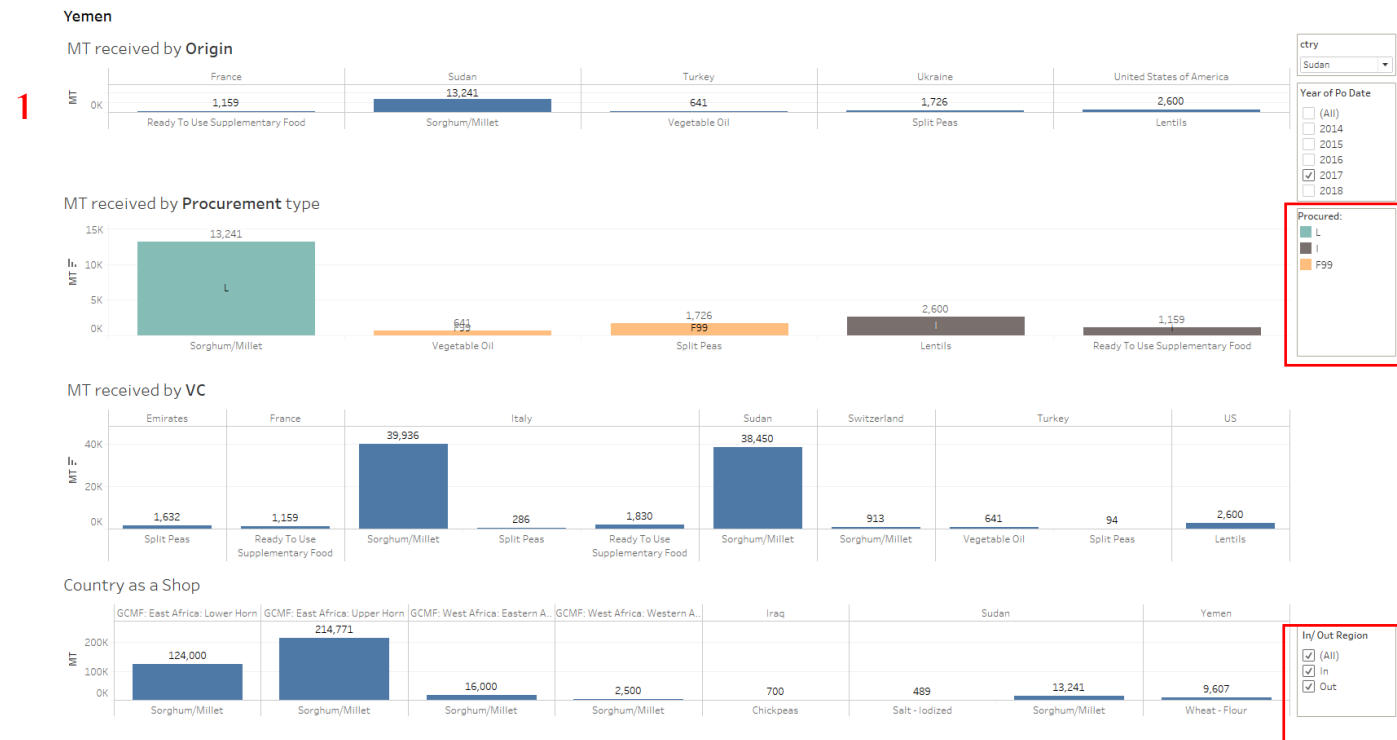
4. Implementation Requirements – Country M USD (data source: Pipeline)

1. Implementation requirements for the country selected;
2. Implementation Requirements per Activities planned;
3. Compares implementation plan (dark blue) with expected supply availability (green bars), providing insight into future shortfalls - Food and CBT.

Implementation Requirements - Yemen MUSD



4 5. Procurement MT (data source: PO Report Food)

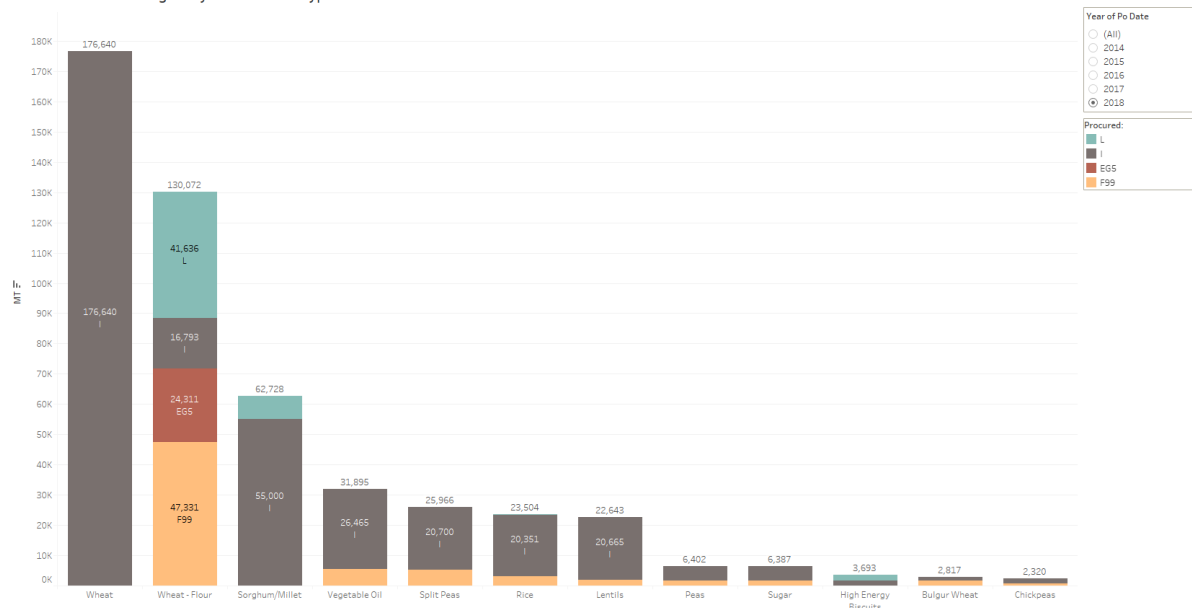


- Commodities (in MT) received in the country selected by Origen country;
- Consolidation per commodity, of the type of procurement done divided by:
 - L (Local), commodity procured by the receipt country, bought in the country;
 - EG5 (RBC), commodity procured by the bureau from a country in RBC region;
 - F99 (HQ), commodity procured by headquarters from a country in RBC region;
 - R (Regional) commodity procured in the region by other country;
 - I (International) commodity procured by headquarters from a country outside of the region.
- Commodities (in MT) received in the country selected by Vendor country;

- Commodities (in MT) that were bought in the country. The filter IN/OUT allow to select the countries IN and/or OUT of the RBC region that bought in the selected country. Provides insight of the production capacity of the selected country.

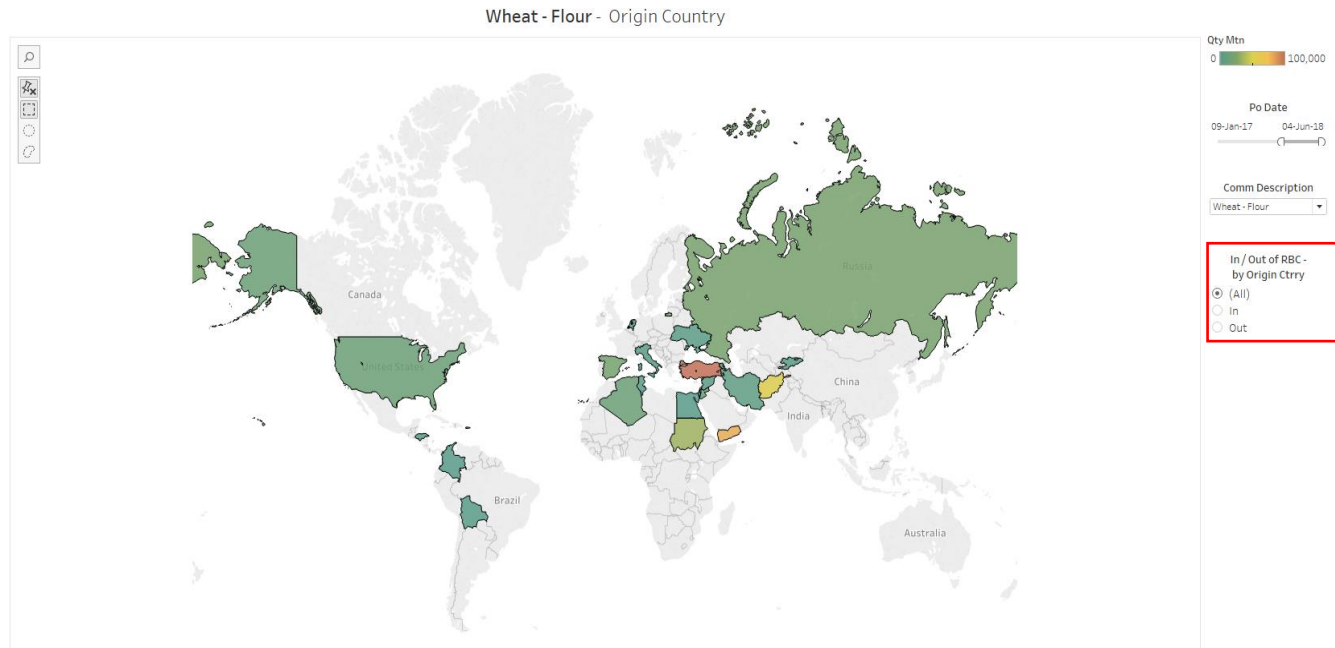
6. Procurement - Region Consolidation MT (data source: PO Report Food)
Consolidation of MT received in RBC region by procurement type.

MT received in the Region by Procurement type



7. Sourcing Map MT (data source: PO Report Food)

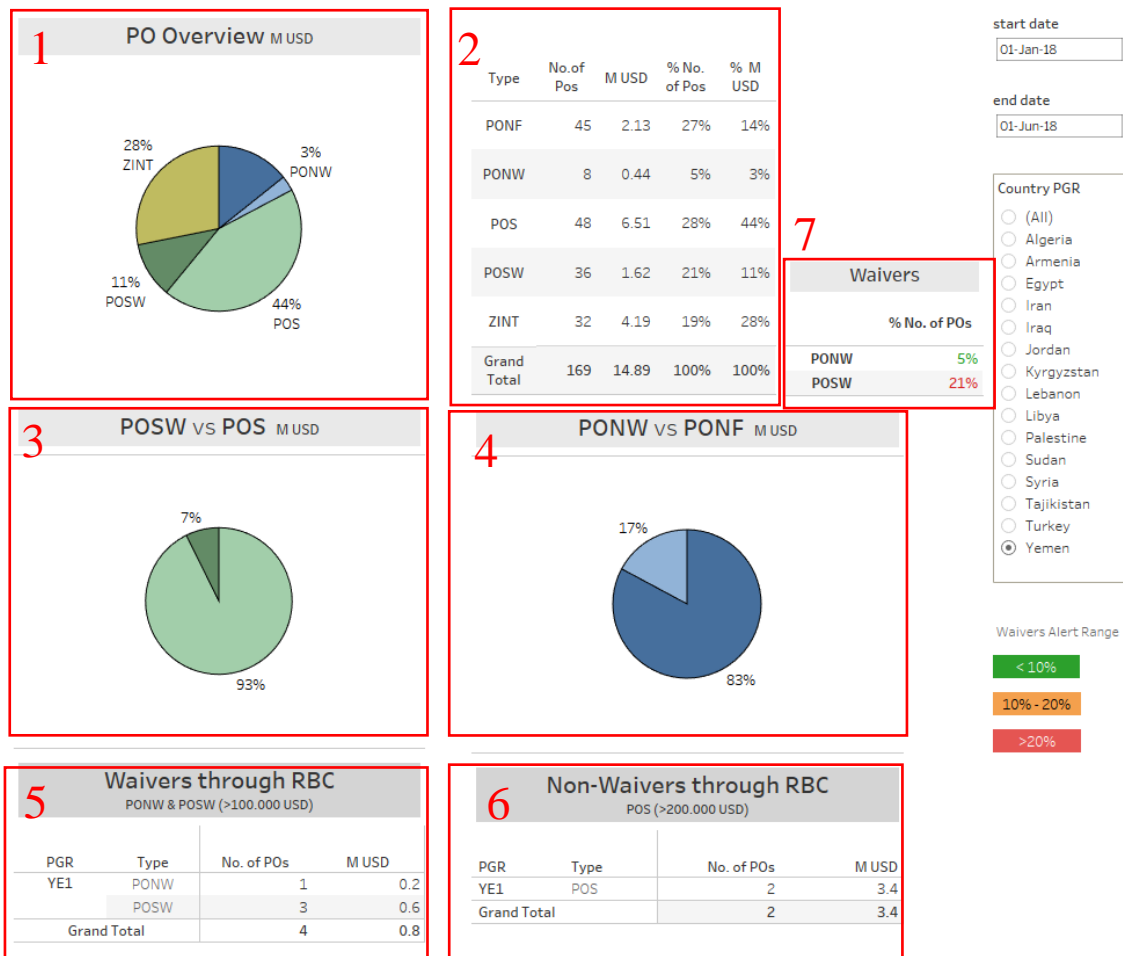
Per commodity selected and for a PO date period, the sourcing map analyse the origin countries of it and divides per indicative quantity colour range (in MT). Is possible to select the origin countries IN and/or OUT of the RBC region.



8. Goods & Services MT (data source: NFI/ Services PO Report)

1. % in USD of the POs released from the select country in that period;
 2. POs released details: number of POs and respective USD value;
 3. POSW vs POS in USD;
 4. PONW vs PONF in USD;
 5. PO waivers thought RBC for values up to 100.000 USD;
 6. PO competitive thought RBC for values up to 200.000 USD;
 7. Control Board for the number of waivers released by the selected country in that period.
- Green if represents less than 10% of the total POs, orange between 20% and 30% and red if superior to 30%.

Yemen - Goods & Services



9. RTA/ Ship to vs GR doc. Date (data source: PO Report Food)

1. Ship to vs GR doc. Date: Number of PO items, average of days and MT based on Late, On Time and Early Arrivals

2. RTA disch vs GR doc. Date: Number of PO items, average of days and MT based on Late, On Time and Early Arrivals

3. Details of the PO.

In addition, the filter “PGR” allows to select the purchase group responsible for that purchase order.

Yemen - RTA/ Ship to vs GR

1 Ship to vs GR doc. Date

	No. PO items	Average of Days Ship	MT
Late Arrivals	26%	12	10.7
On time	2%	1	0.0
Early Arrivals	72%	34	8.6

2 RTA disch. vs GR doc. Date

	No. PO items	Average of Days RTA	MT
Late Arrivals	49%	23	3.7
Early Arrivals	51%	24	19.3

PO date - Start .. 01-Jan-18
End Date 01-Jun-18
Recipient Ctry .. Yemen

3 PO details

Ship to vs GR doc. Date

Po No	Po No Item	Pgr	Late A..	On ti..	Early ..
4500065987	450006598..	F99			3.00
4500065241	450006524..	EG5			5.00
	450006524..	EG5	-6.00		
4500066091	450006609..	F99	-5.00		
	450006609..	F99			5.00
4500066359	450006635..	YE1			5.00
	450006635..	YE1	-1.00		
4500065921	450006592..	F99			9.00
4500066701	450006670..	YE1	-5.00		
	450006670..	YE1	-5.00		
	450006670..	YE1	-5.00		
	450006670..	YE1			16.00
4500066358	450006635..	YE1			18.00
4500065533	450006553..	YE1			21.00
4500066642	450006664..	F99			21.00
4500066398	450006639..	TH5			14.00
	450006639..	TH5			10.00
4500066804	450006680..	YE1			24.00
4500066596	450006659..	YE1			27.00
4500066002	450006600..	YE1			16.00
	450006600..	YE1			16.00
	450006600..	YE1			13.00

RTA disch. vs GR doc. Date

Po No	Po No Item	Pgr	Late Arri..	Early Arr..
4500065987	450006598..	F99		18.00
4500065241	450006524..	EG5		1.00
	450006524..	EG5	-10.00	
4500066091	450006609..	F99		15.00
	450006609..	F99		25.00
4500066359	450006635..	YE1		7.00
	450006635..	YE1		1.00
4500065921	450006592..	F99		29.00
4500066701	450006670..	YE1	-5.00	
	450006670..	YE1	-5.00	
	450006670..	YE1	-5.00	
	450006670..	YE1	-5.00	
4500066358	450006635..	YE1		20.00
4500065533	450006553..	YE1		21.00
4500066642	450006664..	F99		41.00
4500066398	450006639..	TH5		40.00
	450006639..	TH5		28.00
4500066804	450006680..	YE1		27.00
4500066596	450006659..	YE1		28.00
4500066002	450006600..	YE1		16.00
	450006600..	YE1		16.00
	450006600..	YE1		13.00

10. Vendor Share (data source: PO Report Food)

Control Board for % USD of each vendor. Green if its less than 10%, yellow between 20% and 30%, orange between 20% and 30% and red if bigger than 30%.

1. Vendors list for the period selected. Details on the MT bought, USD value and the percentage of USD that the vendor represents in the total of vendors;
2. Summary of number of vendors in between each alert range

47

Yemen - Vendor Share

1

Details

Name	MT	USD	% USD
USA USAID/FFP	217,590	67,995,260	32.9%
FPF VENDOR	139,725	41,342,305	20.0%
AL MOHSEN BROTHERS COMPANY FOR AGEN	26,770	9,295,940	4.5%
YEMEN COMPANY FOR FLOUR MILLS AND S	117,716	41,204,579	20.0%
CER.FAR. SAS IMPORTAZIONE ED ESPORT	6,933	4,290,119	2.1%
SAYGA FOOD INDUSTRIES	24,311	9,656,868	4.7%
FPF Vendor	31,541	10,912,855	5.3%
HAKAN AGRO DMCC	4,032	1,307,699	0.6%
ERISLER GIDA SANAYI VE TICARET AS	6,050	1,754,500	0.8%
ULUSOY UN SANAYI VE TICARET ANONIM	4,647	1,313,792	0.6%
SAU MEWA	728	1,028,759	0.5%
Aden Silos & Mills Co.	10,000	3,450,000	1.7%
MINISTRY OF AGRICULTURE FOOD AND RU	17,000	6,647,000	3.2%
OLIMP LTD	1,014	344,760	0.2%
ULAS GIDA UN TEKSTIL NAKLIYE TICARE	14,167	3,895,788	1.9%
YEMEN COMPANY FOR INDUSTRIAL INVEST	5,085	2,025,543	1.0%
Grand Total	627,309	206,465,765	100.0%

2

No. of Vendors	
<10%	12
10% - 20%	1
20% - 30%	2
>30%	1

Start Date
01-Jan-18

End Date
01-Jun-18

- Recipient Ctry RBC
- (All)
 - Algeria
 - Armenia
 - Egypt
 - Iran (Islamic Repub...
 - Iraq
 - Jordan
 - Kyrgyzstan
 - Lebanon
 - Libya
 - Palestine
 - Sudan
 - Syrian Arab Republic
 - Tajikistan
 - Ukraine
 - Yemen

No. of Vendors Alert Range

< 10%
10% - 20%
20% - 30%
>30%

11. Late Entries (data source: Material Document List)

Control Board for number of days late. Green if its less than 7 days, yellow between 7 – 14 days, orange between 14 – 21 days and red if bigger than 21 days.

1. Summary of the % and number of material documents inserted late (entry date vs doc. Date);
2. Details of the PO and material description

2

LYCO - Late Entreis

1

PO	Material Description	Mat. Doc.	Days Late
4300049..	LTSH extension	5004248780	36
	ODOC + 7% extension	5004248778	36
4300050..	Price data collection ma...	5004248641	36
		5004367022	26
	LTSH JAN-JUN 18 (HALF LTSH)	5004367090	26
		5004258210	18
		5004228845	8
4300051..		5004367025	26
	ODOC+7%	5004248645	19
		5004258208	18
		5004228550	12
	LTSH jan - jun 2018	5004472317	92
4300051..		5004472321	92
		5004436552	81
	ODOC + 7%	5004436667	81
		5004436670	49
		5004258155	18
4500064..	Q+Q RATIONS	5004096633	15
		5004174830	14
	Transport from Sabratha to Tripoli	5004149756	6
4700518..		5004174829	5
		5004141834	2
	Transport from Sabratha to Zawia	5004174831	14
	5004174832	14	

Days Late	No. of Material Docs.	% Mat. Docs.
< 7 days	83.0	24%
7 - 14 days	38.0	11%
14 - 21 days	55.0	16%
>21 days	177.0	50%
Grand Total	353.0	100%

start date.
01-Jan-18

end date.
01-Jun-18

- Plant
- (All)
 - AMCO
 - DZCO
 - EGCO
 - IQCO
 - IRCO
 - JOCO
 - KGCO
 - LBCO
 - LYCO
 - PSCO
 - SDCO
 - SYCO
 - TJCO
 - TNCO
 - TRCO
 - UACO
 - YECO

- Late Entreis Alert Range
- < 7 days
 - 7 - 14 days
 - 14 - 21 days
 - > 21 days

RBC Supply Chain

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