Technical Assistance to Strengthen the Angola Central Medical Warehouse System

August 2014

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SIAPS
Systems for Improved Access to Pharmaceuticals and Services

Technical Assistance to Strengthen the Angola Central Medical Warehouse System

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About SIAPS

The goal of the Systems for Improved Access to Pharmaceuticals and Services (SIAPS) Program is to assure the availability of quality pharmaceutical products and effective pharmaceutical services to achieve desired health outcomes. Toward this end, the SIAPS result areas include improving governance, building capacity for pharmaceutical management and services, addressing information needed for decision-making in the pharmaceutical sector, strengthening financing strategies and mechanisms to improve access to medicines, and increasing quality pharmaceutical services.

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Key Words

Central medical warehouse, human resources, information system, key performance indicators, standard operating procedures, product layout, product location, warehouse management system

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ACRONYMS AND ABBREVIATIONS

CECOMA	Central de Compras de Medicamentos e Meios Medicos de Angola (Central Procurement Agency for Medicines and Medical Supplies)
CW	central warehouse
FEFO	first expiry, first out
GVW	gross vehicle weight
HR	human resources
HRCD&PI	Human Resource Capability Development and Performance Improvement [program]
IHS	Imperial Health Sciences
ISO	International Organization for Standardization
KPI	key performance indicator
KPL	kilometers per liter
LMIS	Logistics Management Information System
MHE	mechanical handling equipment
MINSA	Ministério da Saúde
MOH	Ministry of Health
MSH	Management Sciences for Health
POD	proof of delivery
POEP	pedestrian-operated electronic pallet [truck]
RFI	request for information
RFQ	request for quotation
RW	regional warehouse
SCPI	Supply Chain Performance Improvement [Program]
SIAPS	Systems for Improved Access to Pharmaceuticals and Services
SMART	specific, measurable, achievable, realistic, and time-bound
SOP	standard operating procedure
SWOT	strengths, weaknesses, opportunities, threats
TA	technical assistance
USAID	US Agency for International Development
WHO	World Health Organization
WMS	warehouse management system

ACKNOWLEDGMENTS

This technical assistance activity involved collaboration among the Systems for Improved Access to Pharmaceuticals and Services (SIAPS) Program funded by the US Agency for International Development (USAID) and implemented by Management Sciences for Health (MSH), Imperial Health Services (IHS), and the Angola Ministry of Health's (MOH) Central Procurement Agency for Medicines and Medical Supplies (Central de Compras de Medicamentos e Meios Medicos de Angola; CECOMA). We are grateful to Dr. Mateus Fernandes Sebastião João, CECOMA Director, Dra. Ferreira Juliana Carolina Pinto, CECOMA Deputy Director, and the CECOMA technical staff for their hospitality, cooperation, collaboration, support, review, and insightful feedback on the draft report.

We also wish to thank SIAPS' home office management and staff, SIAPS/Angola Country Project Director and team, and USAID/Angola for their support throughout the implementation of this technical assistance.

EXECUTIVE SUMMARY

Background

The US Agency for International Development (USAID)-funded program, Systems for Improved Access to Pharmaceuticals and Services (SIAPS), implemented by Management Sciences for Health (MSH), has been providing technical assistance to the Angola Ministry of Health (MOH) to improve pharmaceutical management since 2011. An analysis of the Angolan public health supply chain system conducted in November/December 2012 found that the Central Procurement Agency for Medicines and Medical Supplies (Central de Compras de Medicamentos e Meios Medicos de Angola—CECOMA) needed to improve its warehouse management processes, update its procedures, review and improve its human resource capacity development strategies as well as develop and implement key performance indicators (KPI). The resulting report included short- and long-term recommendations and a high-level implementation plan.

In December 2013, SIAPS engaged its specialized resource partner in warehousing, Imperial Health Sciences (IHS), a provider of pharmaceutical supply chain services, to implement the report's recommendations and guide CECOMA to improve its operations and processes. This engagement continued until August 2014.

Approach

SIAPS and IHS first produced an action plan that focused on the following areas:

- Improving warehouse management systems (WMS), the Logistics Management Information System (LMIS), and product identification and locator systems.
- Strengthening the quality of warehouse standard operating procedures (SOP).
- Optimizing the warehouse layout to improve processes.
- Strengthening distribution and transportation management.
- Building human resource capability in warehousing and inventory management through the implementation of the Supply Chain Performance Improvement program.
- Monitoring performance.

These areas in the action plan were based on findings and recommendations from the December 2012 analysis and resulting report. The action plan was shared with CECOMA prior to implementation to obtain support and approval. Following the first technical assistance (TA) visit, the methodology was revised to include the following:

- Promote and apply a "systems strengthening approach" throughout implementation of the plan to improve CECOMA warehousing, and inventory and distribution management system capacity and processes.

- Develop appropriate and needed procedures, tools, and systems to close identified gaps.

- For local ownership and sustainability of the solutions implemented, a fully participatory, capacity-building approach was used throughout the TA process. This involved continual reference and involvement of CECOMA management in discussions, reviewing options, reaching consensus, approving locally appropriate methods and interventions, and agreeing on a way forward for transition planning. Existing personnel were used to develop improvements during workshops (where possible), to initiate implementation of the improvements, to build human resource (HR) capacity, and to create ownership of the solutions. Appropriate, available, evidence-based sample tools were used as resources.

Short-term TA visits to Angola were made in the months of February, April, June, and July 2014. The visits in April and July focused on human capacity development efforts, while the other visits focused on operations.

Findings

Warehouse Management

During the IHS engagement, a number of observations were noted which were provided to CECOMA to address. Use of warehouse space was poor, specifically because some pallets were oversized and/or had cartons overlapping the edges. In addition, many pallets were damaged and some were overweight causing bowing in their centers. Storage conditions were suboptimal; it appears that only about 50% of the air conditioners in the warehouse are functioning at any given time. Consequently, storage temperatures were found to be approximately 2° C above the recommended temperature of 25° C.

There were major gaps in security. For example, passes were not issued to visitors and people and vehicles were not searched. Also, safety measures were not up to standard. Staff did not wear the appropriate safety equipment.

Product Numbering

Product numbering is one of the building blocks for the introduction of an electronic WMS. CECOMA asked SIAPS to provide unique product codes for all items stored in the CECOMA warehouse, based on the World Health Organization (WHO) Model List of Essential Medicines. To comply with these standards, the team worked to obtain the CECOMA's list of items stored in the warehouse and identified the categories that each medicine belonged to in the WHO Model List. However, challenges arose when it was discovered that CECOMA currently stocks items that do not appear on the WHO Model List. Therefore, the team helped CECOMA implement a unique product numbering system.

Key Performance Indicators

One key objective of this engagement was to implement a culture of performance measurement in CECOMA. Data were unavailable to measure a baseline, but CECOMA received guidance via workshops on methods to calculate KPIs. The team developed KPI sheets and instructions to assist CECOMA in measuring its performance. Some of the measurement areas included picking, order accuracy, and dispatch timeliness.

Human Resources and Capacity Development

A visit was conducted in April 2014 to work with senior management from SIAPS and CECOMA to select the modules and outcomes that align with the client's identified requirements to strengthen warehouse competencies. Local legislation, International Organization for Standardization (ISO), and WHO standards were used to determine the benchmarks against which improvements were to be made. A short survey was conducted to assist with the identification of the key requirements of the various acts and regulations. A visit to the warehouse was done to determine the baseline for current operational activity levels. This supported the team to prioritize and select the fundamental elements to focus on to guide training activities.

A total of 12 staff members attended the trainings. The material covered 17 modules; topics ranged from procurement to distribution. In addition, CECOMA participated in a workshop on KPI measurement as performance management was a key focus area. By matching the CECOMA organogram to the KPIs, the training aimed to focus CECOMA management team members on the KPIs that they were personally responsible for. Certain additional data templates for measuring KPIs were developed to aid CECOMA's department heads to gather data manually on a daily basis before updating the KPIs in Excel. A challenge remains in terms of sourcing robust activity and volumes data because there is currently no WMS in place in CECOMA.

Recommendations

To improve the overall functioning, continuous support should be given to the MOH, provincial directorates, and CECOMA to agree on, coordinate, develop, and implement a comprehensive supply chain system strengthening plan. Key recommendations made as a result of this TA include the following:

- Continue supporting the implementation of the CECOMA strengthening plan.
- Continue ongoing improvements in warehouse operations, storage, distribution management, and organizational structure.
- Orient and train CECOMA staff on the new warehouse improvements and tools.

- Continue to assist CECOMA to monitor and improve the performance of the warehouse and staff using selected KPIs.
- Promote performance improvement through the implementation of KPIs.
- Assist CECOMA to develop and implement a roadmap for planning, selecting, procuring, deploying, and building HR capacity to use a new comprehensive WMS.
- Migrate improved systems to new CECOMA sites.
- Roll out improved systems to CECOMA regional warehouses.
- Explore embedding a long-term warehousing consultant to provide hands-on support for the implementation of improvements on the ground at CECOMA.

Aside from the focus areas of this TA, activities in procurement, governance, and information systems are also critical to the continuous development of CECOMA.

BACKGROUND

The goal of the Systems for Improved Access to Pharmaceuticals and Services (SIAPS) Program funded by the US Agency for International Development (USAID) and implemented by Management Sciences for Health (MSH) is to assure the availability of quality pharmaceutical products and effective pharmaceutical services to achieve desired health outcomes. To achieve this goal, SIAPS is collaborating with several partners, including Imperial Health Sciences (IHS). IHS is a South African-based provider of pharmaceutical supply chain and logistics services. SIAPS is currently providing technical assistance (TA) to strengthen the Angola Ministry of Health's (MOH; *Ministério da Saúde-MINSA*) Central Procurement Agency for Medicines and Medical Supplies (*Central de Compras de Medicamentos e Meios Medicos de Angola*—CECOMA), based on findings and recommendations of an analysis of the Angolan public health supply chain system conducted in 2012.[1] The analysis found that CECOMA needed to improve its warehouse management processes, update its procedures, review and improve its human resource (HR) capacity development strategies as well as develop and implement a performance monitoring system based on agreed upon key performance indicators (KPI). The assessment report recommended short-, medium- and long-term improvements in the management and operation of CECOMA, actions that the warehouse needed to take as part of efforts to reposition CECOMA to be a state-of-the-art regional warehouse from which model approaches, processes, and systems could be rolled out to the three other regional warehouses. This network of warehouses constitutes the main source of health commodities for the Angolan public health system.

Purpose

The purpose of this activity was to design and implement warehouse operations system improvements for CECOMA, and to design and implement a human resource capability development and performance improvement (HRCD&PI) program based on the identified gaps.

Approach

The TA approach/methodology included the following:

- Promoted and applied a "systems strengthening approach" to improve CECOMA warehousing, inventory, and distribution management system capacity and processes, based on the 2012 assessment and on a follow-on rapid assessment conducted as part of the TA. Appropriate best practices, customized to the local context, were used.

- Developed appropriate and needed procedures, tools, and systems to close identified gaps.

[1]Addison D, Miller R, and Goredema W. *Analysis of the Angolan Public Health Supply Chain System*. Report submitted to the US Agency for International Development by the Systems for Improved Access to Pharmaceuticals and Services (SIAPS) Program. Arlington, VA: Management Sciences for Health; 2013.

- For local ownership and sustainability of the implemented solutions, a fully participatory, capacity-building approach was used throughout the TA process. This involved continual involvement of CECOMA management in discussions, reviewing options, reaching consensus, approving locally appropriate methods and interventions, and agreeing on the way forward for transition planning. Existing personnel were used to develop improvements during workshops (where possible), and to initiate implementation of the improvements to build HR capacity and create ownership of the solutions. Appropriate, available, evidence-based sample tools were used as resources.

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- Working with the CECOMA Deputy Director, a comprehensive strengthening action plan was finalized and implemented providing details of the "what," "why," "who," "how," and "expected outcomes" of the engagement (Annex A).

- The development and implementation of standard operating procedures (SOP), KPIs, related worksheets/dashboards, and product numbers used in the system strengthening approach were achieved through the organization of workshops, and using CECOMA personnel to draft SOPs and KPIs relevant to the operations and to select a product numbering system. HR capacity was thereby increased. This methodology created ownership of the solutions.

In December 2013, IHS and SIAPS developed an action plan for the activity, in consultation with CECOMA management. The plan was to be implemented from January to August 2014. The strengthening plan focused on the following key areas:

- Improving the WMS, Logistics Management Information System (LMIS), and product identification and locator systems.
- Strengthening the quality of warehouse SOPs.
- Optimizing the warehouse layout to improve processes.
- Strengthening distribution and transportation management.
- Building HR capability in warehousing and inventory management.
- Monitoring performance.

METHODOLOGY

The assignment entailed conducting a rapid analysis of warehouse and distribution system capacity, including staff capacity, to identify gaps and validate previous findings,[2] and then to design and implement customized warehouse system strengthening improvements as well as an appropriate HRCD&PI program. Information was gathered though record reviews and interviewing CECOMA management and key informants in the different operational units of the warehouse. Qualitative data were collected through one-on-one interviews and focus group discussions. An existing IHS semi-structured questionnaire was adapted and used for the rapid assessment of the warehousing and supply chain operations management (Annex L).

[2] Addison D, Miller R, and Goredema W. *Analysis of the Angolan Public Health Supply Chain System*. Report submitted to the US Agency for International Development by the Systems for Improved Access to Pharmaceuticals and Services (SIAPS) Program. Arlington, VA: Management Sciences for Health; 2013.

CECOMA FINDINGS

Network and Infrastructure

The current CECOMA network consists of a central warehouse (CW) in Luanda that stores commodities and delivers products to 18 provincial warehouses and various health facilities in Luanda province. New regional warehouses (RW) are being built in four provinces:

- Luanda (to replace the current CW)
- Malange
- Benguela
- Huila

In future, these RWs will supply commodities to the provinces, as shown in figure 1.

Figure 1. Planned CECOMA RWs and the provinces they serve

Key

RW	Provinces served by the RW
Luanda RW	Cabinda, Zaire, Bengo, Cuanza Norte
Benguela RW	Benguela, Cuanza Sul, Huambo, Bie
Huila RW	Huila, Namibe, Cunene, Cuanda Cobango
Malanje RW	Uige, Malange, Luanda Norte, Juanda Sul, Moxico

The CECOMA CW was refurbished within the past three years to a high standard. It consists of approximately 3,200 racked pallet spaces and a separate, secure storage area for controlled substances and high-value commodities. The warehouse is fully equipped with air conditioners.

It has a cold room, which is temporarily located in specialized containers for the storage of vaccines and other commodities requiring low temperature storage.

The warehouse is equipped with modern mechanical handling equipment (MHE) including:

- Fork lift trucks
- Pedestrian-operated electronic pallet (POEP) trucks
- Hand pallet trucks

Commodity Flow

Commodities currently flow into the CW and onward to provincial warehouses and government hospitals on a "pull" basis (commodities are ordered by the recipients monthly) and are then "pushed" from provincial warehouses to municipal warehouses and health centers. In addition, some commodities are "pushed" from the CW by donors and public health programs on an ad hoc basis. The exception is HIV and AIDS commodities, which are distributed through a "pull" system[3] by Neofarma (a third-party warehouse) direct to provincial warehouses, bypassing the CW, as shown in figure 2.

[3] Neofarma distributes HIV and AIDS products based on quarterly requisitions from provinces and selected health facilities in Luanda, after validation/approval by the National Institute in the Fight against AIDS.

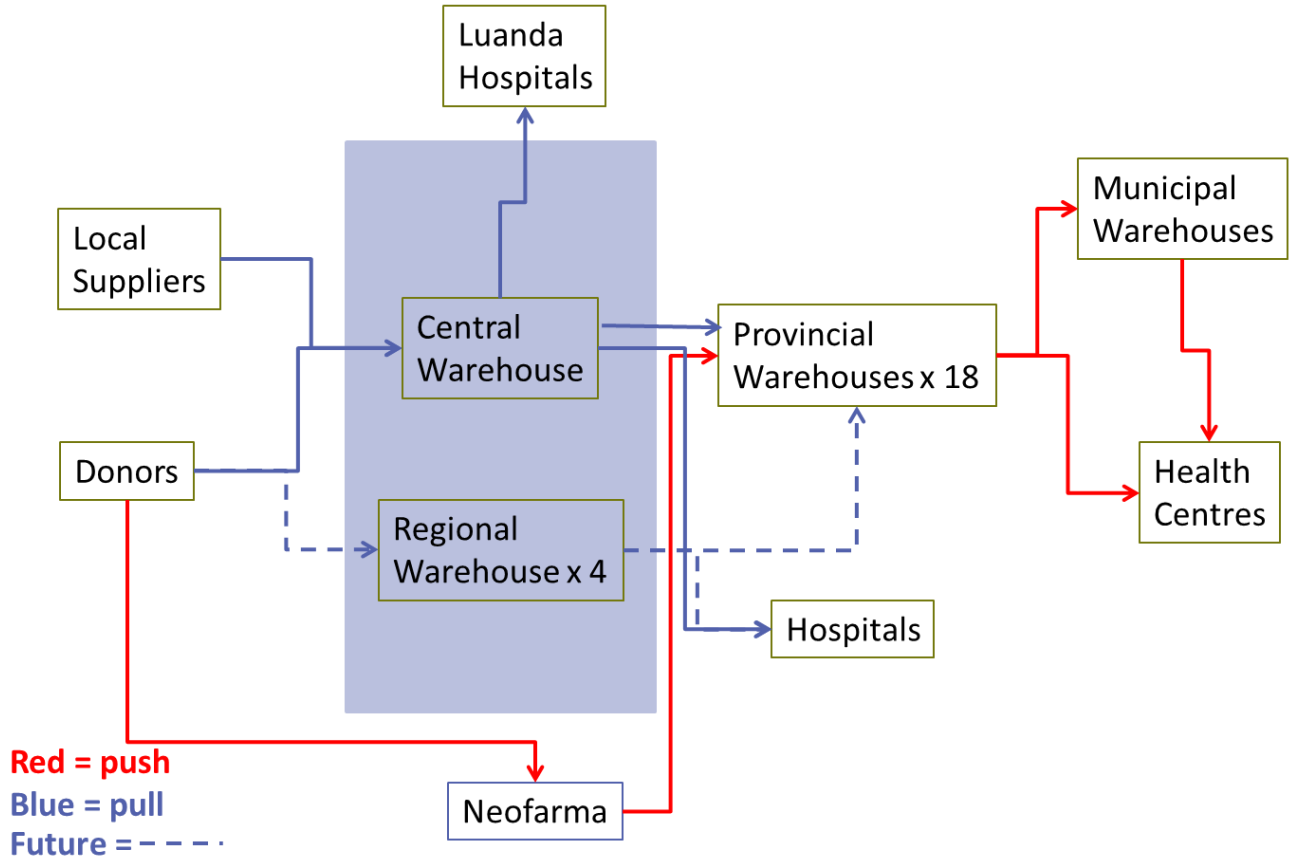


Figure 2. Angola public health supply chain system commodity flow chart

Transport

All CECOMA transportation is provided by sub-contractors who distribute non-medical items, such as vehicles and motorcycles, on behalf of the Angola MOH, as well as medical supplies and pharmaceuticals. Transportation takes place on sub-contracted 7.5 tonne gross vehicle weight (GVW) reefer (refrigerator) trucks for local deliveries in Luanda province, and larger articulated vehicles for longer distance movements.

Planning Department

The planning department, which consists of six technical advisors assisted by a team of Cuban consultants, maintains a large amount of data gathered from:

- Orders placed on a monthly schedule
- Pre-dispatch forms
- Delivery notes
- Signed/annotated delivery notes
- Goods received notes

Despite the volume of data, little information seems to be passed to CECOMA management to assist with the management of day-to-day and month-to-month operations.

Figures 3, 4, and 5 present the flow of paperwork into and through the planning department, as far as could be ascertained.

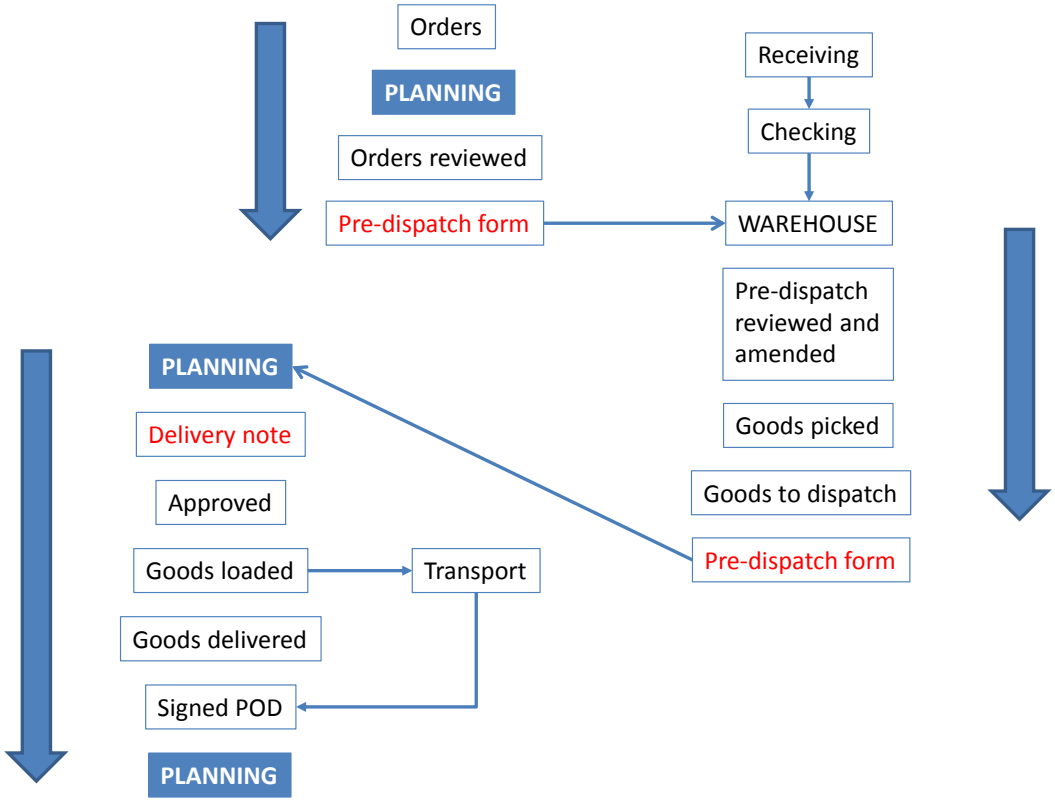


Figure 3. Order documentation flow

Figure 4. Receipt documentation flow

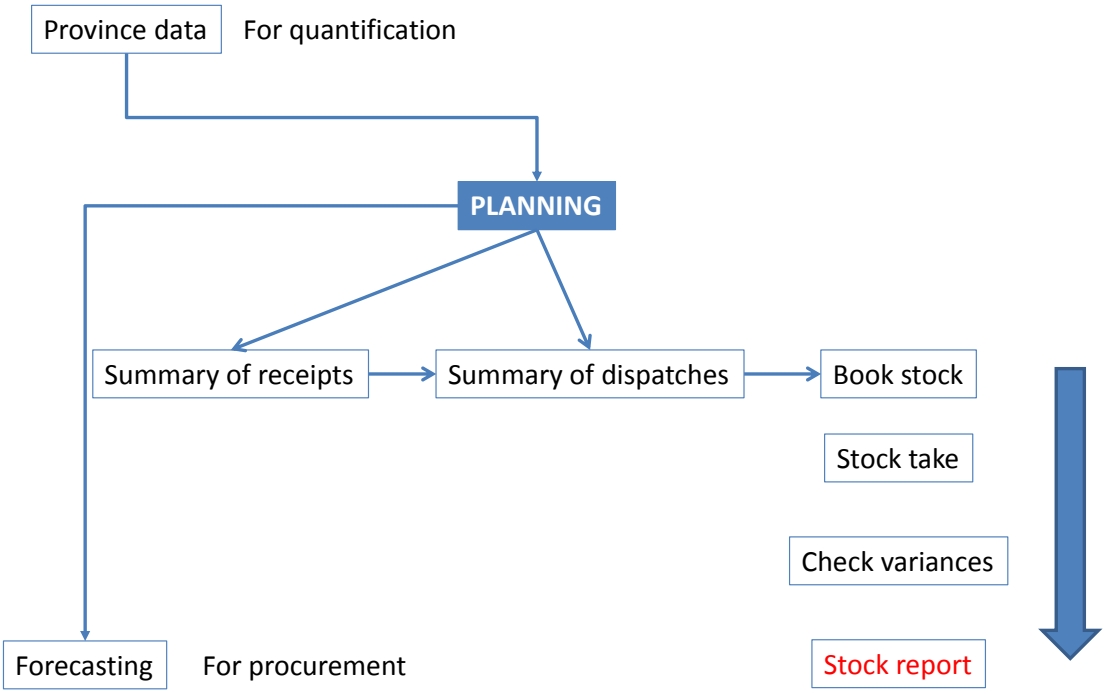


Figure 5. Inventory documentation flow

Organizational Structure

Prior to SIAPS TA, the management structure of the CECOMA warehouse was defined and organized by product type, as shown in figure 6.

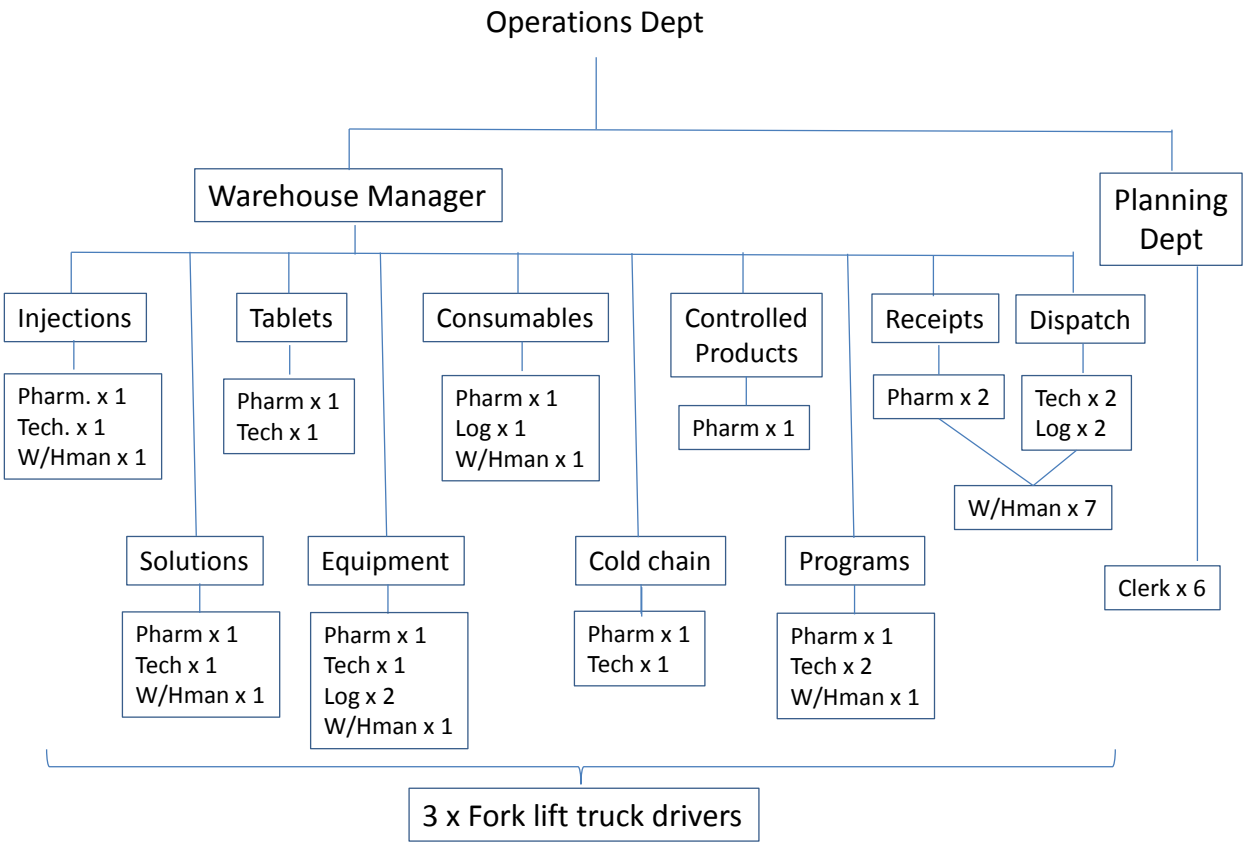


Figure 6. CECOMA organizational structure prior to the TA

Each product type is staffed by a pharmacist, technician (tech), and warehouseman (W/Hman) (some are shared), with three forklift truck drivers serving all areas.

Business is conducted between 09:00 and 15:00 Monday to Thursday, and from 09:00 to about 12:00 on Fridays.

There was no visible performance monitoring taking place and performance metrics (KPIs) were not apparent.

SWOT[4] Analysis

Table 1. Strengths, Weaknesses, Opportunities, and Threats (SWOT)

Strengths	**Weaknesses**
Excellent warehouse physical condition and handling equipment Personnel willing to make improvements Support from senior management Suggested improvements accepted and underway	Sub-optimal environmental (temperature) conditions No location identification Lack of SOPs Organizational structure based on product lines Sub-optimal space utilization Gaps in operational safety measures
Opportunities	**Threats**
Increase warehouse utilization Replicate improvements in new regional warehouses Leadership ability to motivate staff (time; active participation in improvement process; flexible, ready to implement the changes) Staff flexibility Move to a new warehouse Plans to procure and deploy a new electronic WMS	Lack of product numbering Lack of pallet location system Lack of WMS Lack of budget to implement the suggested changes as CECOMA was not yet financially independent

The strengths identified are an excellent base on which to build for the future. The weaknesses identified were considered improvement opportunities. They were addressed by developing and implementing a location identification system, developing SOPs, and providing a list of observations (see below) to CECOMA that it should be capable of addressing with only limited technical assistance.

Observations on Operations

During the engagement, a number of observations were noted. The information was provided to CECOMA to address.

Warehouse utilization was poor because of the following specific conditions:

- Some pallets were oversized
- Some pallets had cartons overlapping the edges

In addition, many pallets were damaged and some were overweight causing bowing in their centers.

There were major gaps in security:

[4] Addison D, Miller R, and Goredema W. *Analysis of the Angolan Public Health Supply Chain System*. Report submitted to the US Agency for International Development by the Systems for Improved Access to Pharmaceuticals and Services (SIAPS) Program. Arlington, VA: Management Sciences for Health; 2013.

- Passes were not issued to visitors.
- Employees and contract staff did not carry identification.
- There was no personnel log.
- Vehicle searches were not carried out.
- Bags were not searched when people moved in and out of the warehouse or in and out of the main gates of the premises.

Storage conditions were suboptimal; it appears that only about 50% of the air conditioners in the warehouse are functioning at any given time. Consequently, storage temperatures were found to be approximately 2° C above the recommended temperature of 25° C.

Safety measures were not up to standard:

- Helmets were not used by all personnel.
- High visibility vests were not used.

Signage was not obvious:

- Speed restrictions were not posted.
- Emergency exits were not easily identified.
- Delivery vehicles had difficulty parking at right angles to loading and unloading docks. Simple white lines could assist the maneuvers.

HRCD & PI

A visit was conducted in April 2014 to work with senior management from SIAPS and CECOMA to select the modules and expected outcomes that align with CECOMA's identified requirements to strengthen warehouse competencies. Local legislation, International Organization for Standardization (ISO), and World Health Organization (WHO) standards were used to determine the benchmarks against which improvements were to be made. A short survey was conducted to assist with the identification of the key requirements of the various acts and regulations. During the visit, a visit to the CECOMA warehouse was conducted to determine a baseline of current operational activity levels. This helped the team to prioritize and select the fundamental elements on which to focus and to guide the training activities. (See Annex L for the assessment checklist.)

Specific tasks included:

- Introduction to the CECOMA facility.

- Interviews with key CECOMA management.
- Review of CECOMA.
- Finalize the training approach and mandate.
- Create political will for any change that will be implemented.

After meeting with the CECOMA Director, Dr. Mateus Fernandes, the team agreed to focus on the operational modules first. A training of trainers methodology was agreed upon. Dr. Mateus recognized that this approach would be the best way to develop competency. It would also allow CECOMA to use the trainers to train staff at the provincial level since CECOMA is serving as a role-model and mentor for other public health warehouses. Dr. Mateus requested that the training be conducted while he was in-country to allow him to support it. He also asked whether SIAPS could organize and support a visit for key CECOMA staff to IHS and government warehousing facilities in South Africa to capacitate them to apply the skills gained during the training. Dr. Mateus also requested that the training schedule include a module on supportive supervision at the provincial level because there is currently a big need to improve this area.

The IHS Supply Chain Performance Improvement (SCPI) Program is an in-country training course that provides participants with practical learning experiences to strengthen the client's logistics services. The course promotes a multidisciplinary and integrated approach in line with current warehousing trends. Following a pre-assessment, senior management of CECOMA worked with subject matter experts to customize the learning for the staff. Using information from the June 2014 visit, a two-week HRCD & PI training was conducted with the CECOMA management team in July 2014.

ACCOMPLISHMENTS

Overview

SIAPS and IHS consultants first held a number of preparatory meetings and on-site discussions with CECOMA leadership and senior warehouse management staff. As a result, CECOMA leadership progressively understood and committed to supporting and facilitating warehouse system improvements, and to implementing ongoing KPI-based monitoring of the performance of warehouse operations.

A rapid baseline analysis of CECOMA, examining existing performance and gaps, was conducted to inform the design and implementation of appropriate warehouse system improvements. This led to the following key outputs:

- Developed and implemented a strengthening action plan for CECOMA.
- Designed and initiated implementation of CECOMA-approved warehouse system improvements.
- Designed and implemented an HRCD&PI program. This involved: conducting capability development training for CECOMA leadership and staff on warehouse operations management; designing and implementing KPIs for performance improvement and monitoring; and providing practical coaching and assisting the warehouse to develop and initiate the implementation of a customized warehouse performance measurement approach, KPIs, and related tools for decision-making.

Management Structure

As shown in figure 6 above, the management structure of CECOMA's warehouse department is currently organized along product lines. Although the operation works relatively smoothly, a modern warehouse should be managed on a functional basis rather than by product group to increase flexibility and reduce the manpower required for order picking.

The structure presented in figure 7 addresses this situation. The rationale for a change to the organizational structure was provided to CECOMA (Annex B). Changes have already been made through the new Presidential decree No 269/14 of September 22, 2014, which approves the organic statute of CECOMA**.**

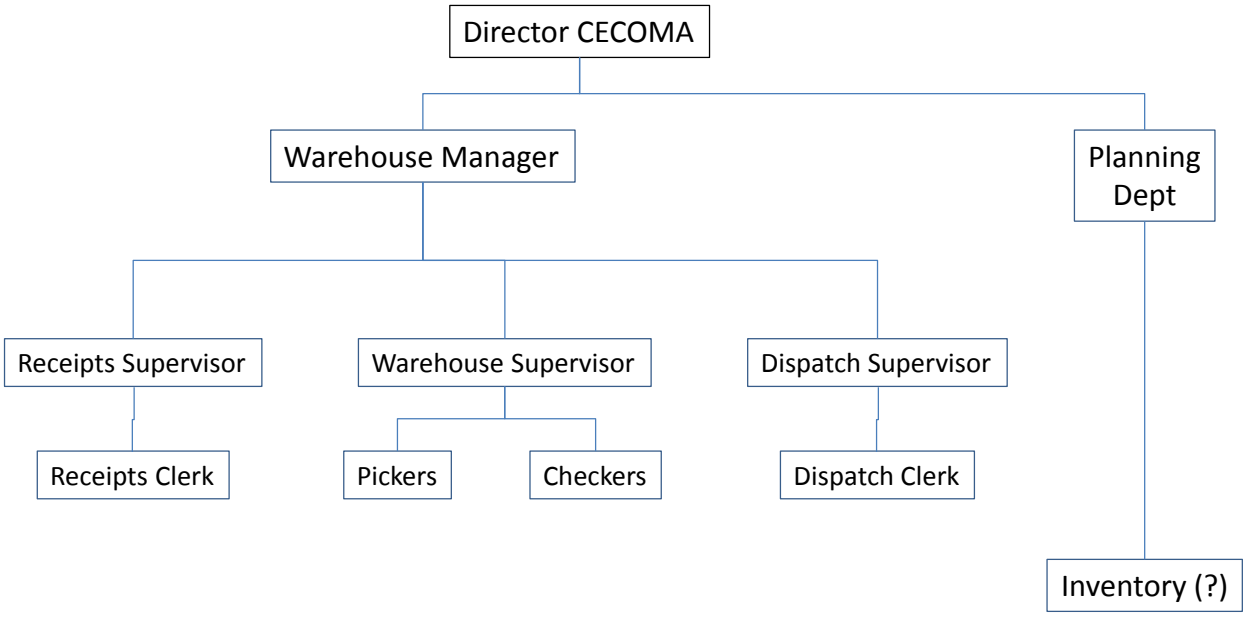


Figure 7. New CECOMA organizational structure

In addition to the suggested structural changes, job descriptions for the following positions were provided (Annex C):

- Warehouse manager
- Warehouse supervisor
- Receipts supervisor
- Receipts clerk
- Dispatch supervisor
- Dispatch clerk

Warehouse Management

To assist with the daily management and operation of the warehouse, the management guide described below was provided. It outlines the basic principles involved in effective warehouse management. A presentation was given describing the steps that should be taken to ensure the ongoing smooth management of the warehouse (Annex D). Additional guidance was provided regarding warehousing "best practices" (Annex E).

Management Guide

The secret to a smoothly running warehouse is "no surprises." If the opportunity for surprises is minimized, everything else falls into place.

The management practices listed below are actions that should be taken to mitigate the opportunity for surprises to happen.

Goods Receipt

- All goods being delivered to the warehouse should be scheduled.
- All products (pallets) should be labelled on receipt.

Goods Dispatch

- Product numbers should be included on all documentation.
- All cartons for dispatch should include full recipient details and should be numbered "1 of 5, 2 of 5," etc.

Inventory Control

- Regular stock taking should be scheduled comparing physical stock with book stock.
- The warehouse (product) layout should be reviewed annually.
- Fast moving products should be stored closest to the dispatch area.
- Controlled access areas should be provided for high-value and narcotic products.
- Temperature should be monitored regularly.

Health and Safety

- Forklift trucks should be regularly maintained.
- Forklift truck drivers should be trained and certified.
- Everyone in the warehouse should wear a hard hat.
- Everyone in the warehouse should wear a high visibility vest/jacket.
- Forklift trucks should have warning sounds and lights.
- The warehouse should be cleaned on a daily basis.

Information

- KPIs should be published for all to see.
- Continuous improvement should be actively encouraged.

Dealing with Surprises

- All roles should include flexibility to cover for absences/sickness/holidays and volume changes.
- Decision making and responsibility should be delegated to the appropriate level.
- Regular training should take place for all personnel.

Capacity Development

Throughout the engagement, a series of workshops were held to increase the involvement of staff, develop their capacity within their roles, and create buy-in for the changes and enhancements being proposed. The following workshops were conducted:

- SOP development – Four workshops were held, three during the first trip and a follow-up workshop during the second trip to reinforce the learning.

- KPI development – One workshop was held to explain the need for KPIs and suggest a series of useful KPIs for CECOMA.

- Product numbering – One workshop was held to suggest methods for product numbering (examples from other countries) and to arrive at a consensus for product numbering at CECOMA.

- Warehouse management – One workshop was held to explain the need for regular management meetings and reviews that would improve operations and reduce the frequency of unexpected issues.

- Location numbering – One workshop was held to show how rack numbering in a warehouse can enhance the ability to quickly locate specific products and to present a pallet location spreadsheet.

Development of Standard Operating Procedures

To provide an opportunity for HR capacity building as well as to strengthen logistics management at CECOMA, a series of workshops were held to give insight and assistance in the development of SOPs (Annex F).

Three teams, representing different functional areas of warehouse management, were created:

1) Receipt of goods
2) Put away, storage, and picking of goods
3) Checking and dispatch of goods

These three areas represent approximately 75% of the activities in the day-to-day operation of a warehouse.

Each group attended three workshops:

1) Overview of SOP creation and assignment of an overnight exercise.
2) Review of the exercise carried out and suggestions for improvement.
3) Final review of the SOPs created.

A list of the personnel participating in the SOP workshops is provided in Annex K.
By the end of the workshops, three SOPs were developed in Portuguese and handed over to CECOMA management to review, add document examples, approve, and implement.

An additional 10 sample SOPs were provided to CECOMA management for staff to revise and customize later, as needed, based on warehouse conditions and needs, using skills developed in the workshops. They were:

1) Stock take control
2) Transport by sub-contractors
3) Driver instructions
4) Handling of proof of delivery (POD)
5) Quarantine stock
6) Warehouse cleaning
7) Warehouse pest control
8) Preparation of job descriptions
9) Cold chain
10) Security

Transport Operations

As indicated above, CECOMA currently uses a third party to manage the distribution of all products from the CW to provincial warehouses and major hospitals throughout Angola. The cost effectiveness of this outsourced operation was not assessed, however, there are a number of solutions that might provide better results in the future. Detailed guidance on transport operations is provided in Annex O**.**

KPIs and Reports

KPIs are performance measurements that can be used to evaluate progress or success of a particular activity or project. They are used to set performance standards and targets that can be used to inform decisions to ensure the organization achieves its mission, goals, and specific, measurable, achievable, realistic, and time-bound (SMART) objectives. However, many public health organizations, such as public medicine supply organizations or central medical stores, have difficulty with designing and using KPIs to set SMART objectives. This intervention included collaboratively agreeing on KPIs, building CECOMA's staff's capacity to select and design appropriate KPIs, and designing a warehouse performance monitoring approach based on the agreed-upon KPIs to help staff in managing their operation more effectively.

A workshop was held for CECOMA staff that reviewed the reasons for having KPIs and the type of activities that should be monitored in an effective operation (Annex G).

The tables below provide details of KPIs for CECOMA, including the method of calculation and the frequency of reporting. They include KPIs for:

- Picking accuracy
- Customer complaints
- Staff absences

- Dispatch timeliness
- Warehouse temperature variance
- Receipt timeliness
- Inventory accuracy
- Expired cartons
- Warehouse utilization

Table 2. Picking Accuracy

Objective	To measure the accuracy of the order that is picked against the pre-dispatch form.
Measure	Number of order lines not properly picked (i.e., according to the order in terms of SKU, quality, and quantity) in a week as a percentage of the total number of order lines in that week.
Numerator:	Number of order lines not properly picked in a week
Denominator:	Total number of order lines in that week
Calculation:	{100% - (Total orders with any errors/Total orders picked * 100)}
Expected result:	100%

Table 3. Order Accuracy

Objective	To measure the accuracy of the order that is dispatched against the delivery note.
Measure	Number of orders marked by the delivery point as being in error as a percentage of the total number of orders in that week.
Numerator:	Number of orders marked by the delivery point as being in error in a week
Denominator:	Total number of orders in that week
Calculation:	{100% - (Total orders with any errors/Total orders * 100)}
Expected result:	100%

Table 4. Customer Complaints

Objective	To measure the service provided to customers by the warehouse and transport operations.
Measure	The number of complaints (excluding errors on delivery notes) notified to CECOMA by customers in a week.
Numerator:	The number of complaints received from customers (excluding errors on delivery notes) in a week
Denominator:	Total number of orders in that week
Calculation:	Total complaints received/Total orders * 100
Expected result:	0%

Table 5. Staff Absences

Objective	To measure the number of days lost through staff sickness and other absences (excluding holidays).
Measure	The number of absent days (excluding holidays) by staff in a week
Numerator:	The number of man days of staff absence in a week
Denominator:	Total number of expected staff man days in that week
Calculation:	Total absent days (excluding holidays) /Total man days * 100
Expected result:	0%

Table 6. Dispatch Timeliness

Objective	To measure the timeliness of vehicles departing CECOMA to make deliveries.
Measure	The number of delivery vehicles departing CECOMA after the expected time of departure in a week.
Numerator:	The number of vehicles departing late in a week
Denominator:	Total number of vehicles departing in that week
Calculation:	100% - (Total vehicles departing late/Total vehicles departing *100)
Expected result:	100%

Table 7. Temperature Variances

Objective	To measure the effectiveness of air conditioning in the warehouse.
Measure	The number of times that warehouse temperature monitors indicate a temperature of more than 25 degrees C.
Numerator:	Total number of readings more than 25 degrees C in a week
Denominator:	Total number of readings in that week
Calculation:	Total number of readings >25C/Total readings *100
Expected result:	0%

Table 8. Receipt Timeliness – (To be measured monthly, not weekly, because the numbers are too small)

Objective	To measure the timeliness of vehicles arriving at CECOMA to make deliveries
Measure	The number of delivery vehicles arriving at CECOMA after the expected time of arrival in a month
Numerator:	The number of vehicles arriving late in a month
Denominator:	Total number of vehicles arriving in that month
Calculation:	100% - (Total vehicles arriving late/Total vehicles arriving * 100)
Expected result:	100%

Table 9. Inventory Accuracy

Objective	To measure the accuracy of stock taking and/or the amount of stock lost through leakage.
Measure	The number of variances by product, comparing book stock against physical stock.
Numerator:	The number of product variances found during the monthly stock take
Denominator:	The total number of products found during the monthly stock take
Calculation:	100% - (Total variances/Total products * 100)
Expected result:	100%

Table 10. Expired Stock

Objective	To measure the effectiveness of the first expiry, first out (FEFO) rule and stock holding levels.
Measure	The amount (in cases) of expired stock found during the monthly stock take.
Numerator:	The number of cases of expired stock found during the monthly stock take
Denominator:	The total number of cases found during the monthly stock take
Calculation:	Total cases of expired stock/Total cases * 100
Expected result:	0%

Table 11. Warehouse Utilization

Objective	To measure the space utilization in the warehouse at a particular point in time.
Measure	The amount of space utilized in the warehouse.
Numerator:	The sum of the number of large pallets * 1.25 plus the number of correctly sized full pallets in the warehouse racking
Denominator:	The total number of pallet spaces in the warehouse racking
Calculation:	(Total large pallets * 1.25) + total correct sized pallets)/total pallet spaces * 100
Expected result:	80%

Both a weekly and a monthly spreadsheet were developed for data collection and the conversion of the data into information:

Daily input sheet								
		Delivery notes			Staff absence		Pick accuracy	
Week no.	Date	Orders dispatched	PODs returned	POD errors	Full days	Actual days	Total pre-dispatches	Errors
1	Wed/01/01/2014							
1	Thu/02/01/2014							
1	Fri/03/01/2014							
1	Sat/04/01/2014							
1	Sun/05/01/2014							
2	Mon/06/01/2014							
2	Tue/07/01/2014							
2	Wed/08/01/2014							

Figure 8. Weekly KPI data collection sheet (sample)

Daily input sheet							
		Receipt timeliness		Inventory accuracy		Expired cartons	
Month no.	Date	Vehicles received	Vehicles late	Total products	Total variances	Total cartons	Total expired cartons
1	Wed/01/01/2014						
1	Thu/02/01/2014						
1	Fri/03/01/2014						
1	Sat/04/01/2014						
1	Sun/05/01/2014						
1	Mon/06/01/2014						
1	Tue/07/01/2014						

Figure 9. Monthly KPI data collection sheet (sample)

Examples of dashboard outputs may be found in Annex G.

In addition to monitoring the KPIs above, the planning department should produce a more comprehensive inventory report, which would include:

- Opening stock (closing stock from the previous month after adjustments)
- Summary of receipts (during the month)
- Summary of dispatches (during the month)
- Destroyed stock (below quality expectations or expired)
- Closing stock (calculated book stock)

- Physical stock (physical stock counted)
- Variances (difference between closing stock and physical stock)
- Expired/unusable stock (stock in the warehouse awaiting disposal)
- Quarantine stock (stock not yet cleared for distribution)
- Available stock (stock available for distribution)

Another dashboard was created in Excel and given to CECOMA to provide information to staff on the current operation, including cartons received each day and cartons dispatched each day.

Product Numbering

One of the essential building blocks for the introduction of an electronic WMS is the numbering of products.

CECOMA asked SIAPS to provide unique product codes for all items stored in the CECOMA warehouse, based on the WHO Model List of Essential Medicines.

To respond to this request, the following steps were taken:

- Converted the WHO Model List (April 2013), which is in PDF format, to Excel.
- Obtained from CECOMA the list of all items stored in the warehouse.
- Translated the CECOMA list from Portuguese to English, where necessary.
- Identified the category that each medicine belonged to in the WHO Model List.

To establish a full-blown electronic WMS, it is essential that all product codes contain the same number of characters.

Challenges

- CECOMA currently stocks items that do not appear on the WHO Model List.

- Additional items, such as consumables, do not appear on the WHO Model List but also require unique product codes.

- Different dispense types require different unique codes, for example:

  - Amoxicillin 250 mg dispersible tablet
  - Amoxicillin 250 mg capsule

- Different presentations require different unique codes, for example: Blister pack 10x10 and 1000 tablets/tin would have two different codes.

- Medicines in the WHO Model List appear in more than one category, for example, acetylsalicylic acid appears as follows:

Table 12. Example of WHO Model List Medicine (Acetylsalicylic Acid) Appearing in Multiple Categories

Category	Sub-category
Medicines for pain and palliative care	Non-opioids and non-steroidal anti-inflammatory medicines
Antimigraine medicines	For treatment of acute attack
Cardiovascular medicines	Antithrombotic medicines
Medicines for diseases of joints	Juvenile joint diseases

The unique product codes that were created were made up as follows:

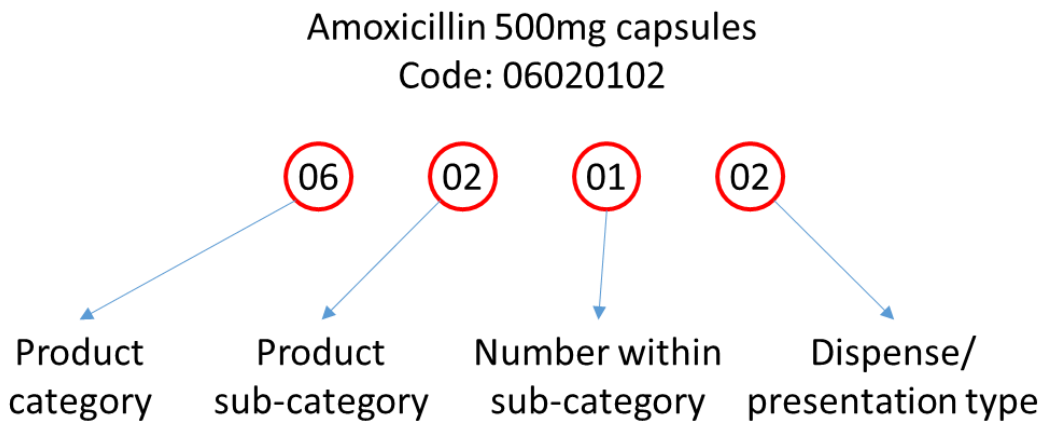


Figure 10. Sample unique product code

Additional categories and sub-categories were added that did **NOT** appear in the WHO Model List, as follows:

Consumables – category 31

- 31.1 Needles/catheters/scalpels/probes
- 31.2 Bandages
- 31.3 Clothing
- 31.4 Film
- 31.5 Bags
- 31.6 Other

Unspecified – category 32 (refers to **medicines** that do not appear in the WHO Model List).
A workshop was held to explain the need for product numbers and to offer suggestions (including the option shown above) for a numbering system for CECOMA (Annex H).

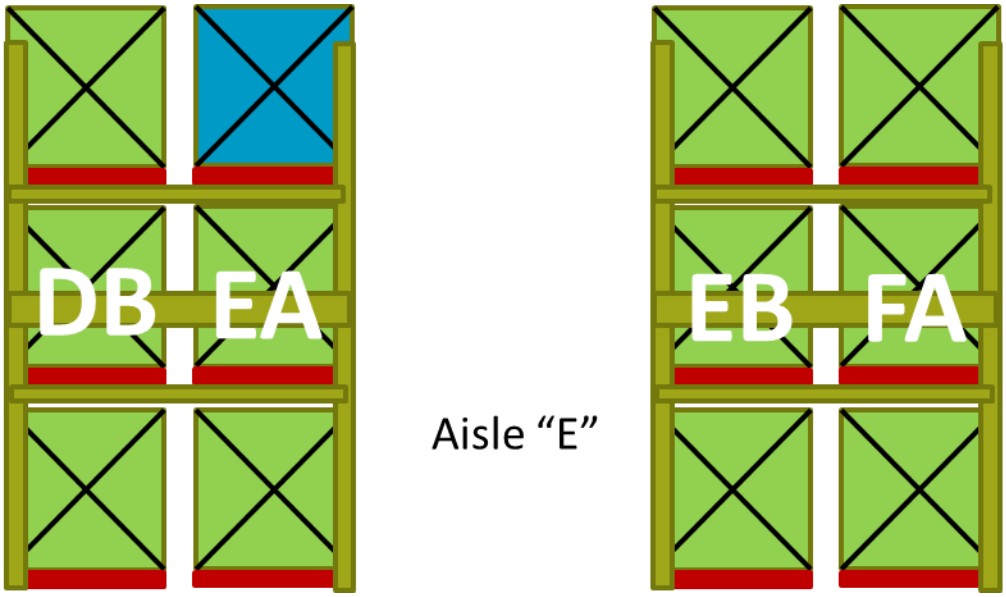
Location Numbering

To improve warehouse management, improve flows, and enhance the ability to move to a full-blown electronic WMS in the future, it was necessary to create a numbering system in the warehouse.
A draft plan of the warehouse was created to include all racking and discrete areas designated for particular types of products.

Figure 11. CECOMA warehouse layout for location numbering

Both aisles and stacks were numbered to create unique locations for all pallets.

Aisles were numbered A to Z. Each side of each aisle was numbered "A" and "B". Stacks were numbered from 1 to 63, as appropriate.



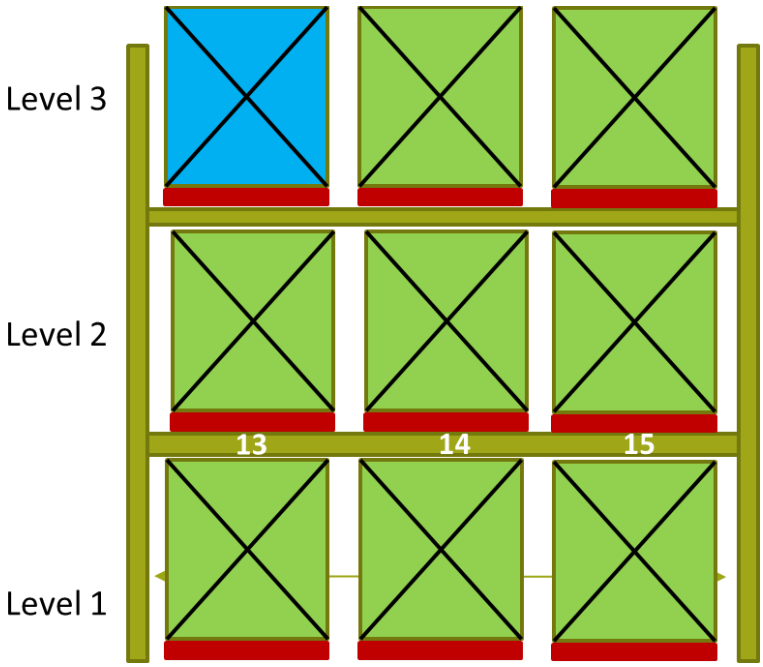


Figure 12. Aisle (top) and stack (bottom) views

Therefore, the "blue" pallet can be identified as EA – 13 – 3.

Pallet Location and Pallet Size

Once the warehouse was numbered throughout, a spreadsheet was created to assist with the simple location of each pallet, together with an indication of the content's closeness to expiry date. Additional documentation was created to keep track of internal warehouse movements, record the "put away" of pallets, and the identification of empty spaces in the warehouse when they are made.

						07/03/2014	
Full location	Product code	Group	Product description	Batch no.	Expiry date	Days to expiry	Expiry flag
AA - 7 - 1	04-14	Injectáveis	DOPAMINA 200 MG/5ML INJECT.		01/12/2014	269	green
AA - 7 - 2	04-14	Injectáveis	DOPAMINA 200 MG/5ML INJECT.		01/09/2015	543	green
AA - 7 - 3	04-14	Injectáveis	DOPAMINA 200 MG/5ML INJECT.		01/07/2015	481	green
AA - 8 - 1	04-14	Injectáveis	DOPAMINA 200 MG/5ML INJECT.		01/09/2015	543	green
AA - 8 - 2	04-14	Injectáveis	DOPAMINA 200 MG/5ML INJECT.		01/05/2016	786	green
AA - 8 - 3	05-01	Injectáveis	AGUA ESTERIL P/ INJEC. X 5 ML		01/02/2016	696	green
AA - 9 - 1	05-01	Injectáveis	AGUA ESTERIL P/ INJEC. X 5 ML		01/08/2015	512	green
AA - 9 - 2	05-03	Injectáveis	ATROPINA SULFATO 1 MG/ML INEJCTÁVEL		01/09/2014	178	amber
AA - 9 - 3	05-03	Injectáveis	ATROPINA SULFATO 1 MG/ML INEJCTÁVEL		01/12/2014	269	green
AA - 10 - 1	05-04	Injectáveis	ADRENALINA 1 MG/ML (EPINEFRINA) INJECT.		01/03/2015	359	green
AA - 10 - 2	05-04	Injectáveis	ADRENALINA 1 MG/ML (EPINEFRINA) INJECT.		01/09/2014	178	amber
AA - 10 - 3	05-05	Injectáveis	BENZILPENICILINA BENZATÍNICA 2,4 M.U.I INJECT.		01/12/2014	269	green

Figure 13. Stock locations

A guide to the spreadsheet was created for CECOMA to use (Annex I) together with templates for the additional documentation required (Annex J).

Both the location numbering system and the pallet location spreadsheet are necessary forerunners for the introduction of a full-blown electronic WMS.

Pallet Size

The ideal pallet size for use in the current CECOMA warehouse is 0.8 m x 1.2 m because each block in the pallet racking is capable of storing three pallets of this size, whereas other (wider) pallets would decrease the utilization of space in the warehouse.

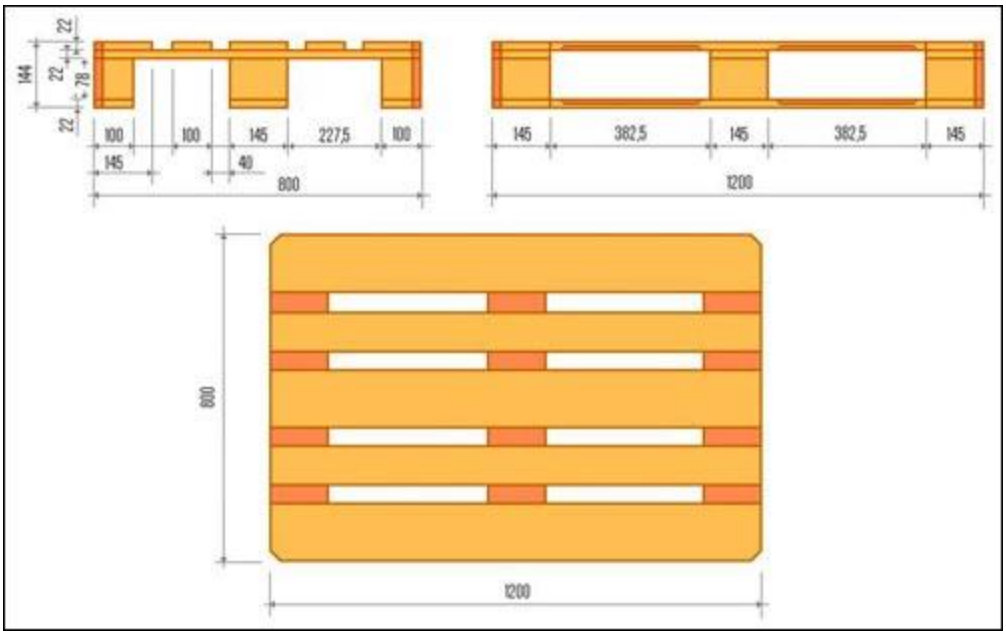


Figure 14. Europallet dimensions

Carton Layout

Cartons stored on each pallet should not overlap the edges in order to avoid any damage to cartons and not to compromise the space available for adjacent pallets.

To ensure the maximum number of cartons on each pallet, there are a number of free calculators available on the Internet, such as www.onpallet.com, where the dimensions of a carton may be entered and the optimum stacking layout will be displayed.

Pallet Quality

All pallets should be damage-free and should not display any sharp edges or breaks in cross-members. Any pallet found damaged in the warehouse should be replaced as soon as possible. If wooden pallets are used, a repair contract with the pallet supplier is a good method of keeping costs to a minimum.

Goods Dispatched on Pallets

It is imperative that strict control is maintained over all pallets. Although not generally understood as a high-cost item, if there is a continual need to replace pallets because they have been delivered to a provincial warehouse or large hospital and left there, the costs will soon mount up.

Two tried and tested methods of ensuring that costs do not get out of hand are as follows:

- When delivering goods to another location, ensure that the driver collects the same number of empty pallets as he delivers.

- Keep a record of the locations where pallets have been delivered, together with the number of pallets delivered and/or collected. At the end of each financial period, conduct a reconciliation and charge the location for the pallets not returned.

HRCD & PI

Based on training focus areas and content that were previously agreed to with the CECOMA Director in April 2014, existing IHS training materials were adapted (as needed), translated into Portuguese, and presented to the CECOMA staff during the HRCD&PI workshop from July 15-25, 2014. Participants included CECOMA top management and key warehouse department heads. Information on the day-by-day training activities and areas covered is provided in Annexes M and N.

KPI Training

SIAPS introduced the concept of KPIs through the development of basic KPI templates for the CECOMA executive staff.

Highlights of the use of the KPIs were included as a critical component in the July training program.

In addition to 17 training modules, three days were spent training the CECOMA management team on the KPI measurements, the source of data points to be entered, frequency, and usefulness of the measures to the organization.

KPI Workshop

The management team at CECOMA, including the Deputy Director, was asked to match the CECOMA organogram to the KPIs template measurements. Responsibility by department head was assigned per KPI measurement.

KPIs and measurement definitions were discussed as a management team and clarified with all participants. An exercise in practical data collection was done by all participants.

By matching the CECOMA organogram to the KPIs, the training aimed to focus the CECOMA management team on the KPIs that they were personally responsible for.

Additional data templates were developed to aid the CECOMA department heads to gather data manually on a daily basis before updating the KPIs in Excel. (Annexes P to T.)

Training was given to staff on which daily data points to record in the KPI templates.

There remains the challenge of sourcing robust activity and volumes data, as there is currently no WMS in place at CECOMA.

During the debriefing discussion with the CECOMA executive staff, SIAPS emphasized the requirements of the KPI measurements and the daily data collection. SIAPS recommended that CECOMA executive staff immediately implement a weekly KPI input meeting where all KPI templates would be populated with data and the results analyzed for informed decision-making. Both parties agreed that there is need for SIAPS/Angola to provide TA support to CECOMA in this effort, as needed.

Notes

It was not possible to fully complete the monitoring of CECOMA warehouse performance through objective pre- and post-intervention measurement of KPIs by August 25, 2014, as originally planned, due to unforeseen challenges that were beyond SIAPS' control. Specifically:

(i) It took SIAPS/IHS a long time to access CECOMA warehouse operations data to be able to conduct a pre-intervention assessment. This was due to an initial reluctance on the part of warehouse management to share necessary information required for evidence-based decision-making and for measuring performance improvement.

(ii) Due to competing priorities at CECOMA, key management and warehouse staff were sometimes unavailable to fully participate in preparations and data collection activities to support performance assessments, as well as to support the implementation of improvement interventions. This led to unforeseen delays along with the need for implementation plan schedule adjustments for assessments and for improvement interventions. Also, HRCD&PI training had to be rescheduled towards the end of the strengthening implementation plan period. As a result, post-intervention measurement could not be feasibly implemented before the end of August 2014.

Despite these challenges, significant progress had been made by the end of August 2014 in capacitating CECOMA to continuously monitor its own performance. This included: capacitating CECOMA leadership and key staff to design and initiate implementation of a customized warehouse performance monitoring and improvement approach; and using agreed-upon KPIs and a guidance document to support their implementation. CECOMA leadership and staff were also trained in the application and use of KPIs in decision-making. Following these efforts and for the purposes of sustainability, CECOMA and SIAPS/Angola agreed that CECOMA would continue to regularly collect the KPI data for its warehouse performance measurements, with SIAPS/Angola providing TA support (as needed) for a reasonable period, and until such time that a meaningful comparison of pre- and post-intervention data could be done.

Electronic files of all materials that were developed under this TA, including KPIs, guidance documents, dashboards, and other Excel spreadsheets, were submitted to CECOMA via SIAPS/Angola.

GENERAL OBSERVATIONS

- The CECOMA facility appeared to be well maintained, exceptionally clean and tidy. No loose or broken or damaged cartons or stock items were visible in any areas of the warehouse at any time during TA visits.

- There was over stocking of certain provincial labelled “kits” pallets in the aisles, due to the arrival of the past year’s shipment at one time and the lack of warehouse space at provincial warehouses.

- The warehouse had no formal WMS at the time of the TA visits.

- There was continual reference by the CECOMA Deputy Director to the parallel sourcing of alternative medicines by the municipal healthcare facilities/municipalities in Angola. It appears that municipalities each have a healthcare budget to procure urgently required medical supplies from alternative suppliers, and they are using this budget, probably due in part, to the high stock-out rates at CECOMA.

- The KPI, “Medicines availability” measure, was provided by CECOMA staff at: 300/750 Stock Keeping Units (SKUs). No definitive data sources for the above two measures of the KPI were available; rather, “rounded-up” values were provided as “actual values” because CECOMA did not know exactly how many SKUs are managed in CECOMA.

- CECOMA warehouse staff, while seemingly proficient in their daily tasks, do not seem to have a culture of written reporting, especially over long time periods. When asked for data relating to daily activities, it seemed to be difficult to obtain.

- Daily operational tasks seem to be performed well when both inventory and human resources are available. However, there appears to be no sense of urgency for any tasks that need to be performed.

- The warehouse needs to implement continuous self-assessment and performance improvement, using KPI data and performing appropriate root cause analysis of factors associated with sub-optimal warehouse performance, and consequently, sub-optimal availability of medicines at health facilities.

CONCLUSIONS, RECOMMENDATIONS, AND NEXT STEPS

The TA focused on warehousing and distribution, areas where there have been many improvements at CECOMA since 2010. The management of CECOMA is committed and willing to implement changes that will improve the operation.

CECOMA staff are motivated and, with the flexibility of the current leadership, are prepared to accept changes for the better.

There is momentum to change elements of the operation, which must be encouraged on a daily basis. CECOMA should fully implement the comprehensive strategic action plan, with milestones established and timelines agreed to, for ongoing improvements in HR capacity and systems strengthening. There is need to continue to provide TA support (as needed) in this effort and to identify other areas in which CECOMA needs support, such as procurement, HR management, and the supervision role with other provincial and municipal warehouses.

Recommendations

- Continue supporting the MOH, provincial directorates, and CECOMA to agree on, coordinate, develop, and implement a comprehensive supply chain system strengthening plan.

- Synchronize the implementation of enterprise-level short-, medium- and long-term interventions to close gaps across all levels of the supply chain.

- Hold a national supply chain stakeholders' meeting to present, review, and validate the Draft National Supply Chain Strategy.

- Continue supporting the implementation of the CECOMA strengthening plan.

Governance

- Continue implementing ongoing organizational structural adjustments, SOPs, job aids, and HR capacity development.

- Continue ongoing improvements in warehousing operations, including storage, quality assurance, distribution management, processes, material handling, temperature control, and occupational safety.

Information Systems

- CECOMA should improve and promote performance monitoring through the implementation of KPIs. Start by collecting KPIs on a weekly basis. Use the same assessment checklist (see Annex L) that was used prior to HRCD & PI training to conduct

another rapid review of the performance of the warehouse and determine if there has been any progress since the training.

- Develop and implement appropriate LMIS capacity at CECOMA, and at provincial and municipal medical warehouses.

- CECOMA should explore implementing a comprehensive WMS. Assist the warehouse to develop and implement a roadmap for planning, selecting, procuring, deploying, and building HR capacity to use the new WMS. Start by conducting a comprehensive situational analysis of the maturity of the existing warehouse operations management system (tools, processes) and acquire and implement an integrated, enterprise-level, full-blown electronic WMS at CECOMA that responds to CECOMA's needs in terms of WMS scope and capabilities. Consider a modular approach, addressing the most urgent needs first, and delivering modules progressively. Based on identified priorities, consider starting with core warehousing functionality: receiving, put-away, picking, packing, and shipping. Once the core functions/modules are working well, the warehouse could then expand to other appropriate modules. When fully complete, the WMS could:

    - Link CECOMA with all regional and provincial warehouses and other customers nationwide.
    - Include data aggregation, analysis, planning, and procurement functionalities.

Establish milestones and timelines for completing system improvements:

- Migrate improved systems to new CECOMA sites.

- Roll out improved systems to CECOMA regional warehouses. A root cause analysis of demand measurement, information flows, materials resource planning, and procurement practices by all stakeholders is perhaps needed, in light of the discovery of stock-outs of some products on the CECOMA inventory list.

- Explore embedding a long-term warehousing consultant to provide hands-on support for the implementation of improvements on the ground at CECOMA.

Next Steps

The immediate next steps that should be taken by CECOMA and SIAPS to enhance and solidify the actions that have already been taken may be summarized as follows:

Standard Operating Procedures

- Revise warehouse forms to align with the SOPs, as needed.
- Continue to improve SOPs and guides.
- Develop needed SOPs for other departments of CECOMA.
- Assign a responsible department to manage SOPs and related guidance documents.

Stock Location

- Revise forms, as required.
- Conduct a stock take.
- Populate the stock location spreadsheet.

KPIs

- Implement and apply appropriate KPIs in decision-making.
- Create a baseline with initial KPI results against which to compare and analyze future measurements for informed decision-making.

Product Numbers

- Implement the unique product numbering system.
- Include product numbers in all relevant documentation.

General Warehouse Issues

- Improve temperature control and monitoring of storage areas.
- Improve occupational safety measures.
- Increase warehouse utilization.
- Implement the use of the pallet location spreadsheet.
- Ensure that pallets are of the correct size and condition.

Management

- Finalize the organizational structure and job descriptions for all departments of CECOMA.
- Roll out improved systems to regional warehouses.

Performance Improvement

- Train higher-level management staff to roll out HR capacity development and performance improvement trainings to lower-level warehouse staff, as needed in future. Support and provide appropriate on-boarding training for new staff and ongoing mentorship of existing staff on the implementation of improved systems.

- Orient and train CECOMA staff on the new warehouse improvements and tools.

- CECOMA to implement performance assessment as an ongoing process, using selected KPIs.

CECOMA (General)

- In line with the new presidential decree establishing CECOMA and its organic statute, identify priorities and develop a strategic plan for CECOMA.

- Review and approve the improvements to date for all the core competences of CECOMA.
- Develop a plan for implementing the improvements, with clear activities, responsible persons, and timelines.
- Implement the improvements.
- Implement and apply appropriate KPIs in decision-making. Initial results to serve as the baseline (CECOMA).
- Develop a WMS implementation roadmap/guide for CECOMA.
- Create a guidance document on proper use of pallets.
- Develop transition plan to facilitate proper migration of improved systems to the new CECOMA warehouse site.
- Compile a toolkit of all developed TA documents and materials, including spreadsheets, guides, sample SOPs, etc., in Portuguese, and submit them to CECOMA.
- Adapt key new system improvement tools into appropriate, simple, pictorial, user-friendly job aids for staff.
- Adapt and roll out the CECOMA transition plan and improved systems to CECOMA regional warehouses.

ANNEX A. CECOMA STRENGTHENING ACTION PLAN

ACTIVITY	PHASE	RATIONALE	DESCRIPTION	LEAD	INDICATIVE TIME FRAME	RESOURCES NEEDED*	DELIVERABLES	EXPECTED ACHIEVEMENTS	COMMENTS
Improve warehouse management systems, LMIS, product identification and locator systems within CECOMA									
Gather input from CECOMA throughout the project	ALL	To create ownership of solutions	Consulting with CECOMA on a regular basis	Jonathan White	Thoroughout the project	SIAPS team, Stakeholders	Meeting minutes	Continuous involvement with the project and eventual ownership	
Focus on improving warehouse operations management	1	To improve the overall functioning of the CECOMA warehouse	Review the existing CECOMA management structure and suggest improvements	Jonathan White	Feb 2014	Stakeholders (CECOMA, MOH)	Functionally structured organogram	Management functionally structured	
Review current LMIS structure	1	To seek opportunities to improve the collection of data whilst not increasing the admin. overhead		Jonathan White	Feb 2014	Guide	Suggested improvement plan		
Improve LMIS capacity within CECOMA at the central level	1	To increase the availability of useful data within CECOMA	Ensure that data capture covers all locations and products	Jonathan White	Feb 2014-ongoing	SIAPS team	Report that includes findings of current state of LMIS structure and suggested recommendations		
Development of any additional documentation that may be required to facilitate an LMIS	1	To ensure that documentation covers all the necessary aspects of the LMIS	Review existing documentation and ensure that all elements are captured.	Jonathan White	Feb 2014	Data: Current documentation	Suggested documentation required	Documentation in place to support an LMIS	
Inclusion of the master product list into the inventory management system	1	To ease data analysis and improve reporting consistency	Compare the Essential Medicines List with products used in the field and issue unique numbers	Jonathan White	Feb 2014	Essential medicines list	List of uniquely numbered products	Reduction in input errors	
Production of management and operations reports	1	To provide information to relevant parties assisting decision making	Ensure that stakeholders and CECOMA management receive relevant and timely reports	Jonathan White	Feb 2014	SIAPS team	SOPs for: Data input, report production and regularity	Regular and relevant reports	
Train LMIS staff in developments of the new structure	2	To ensure an understanding of the changes that take place	A capacity building workshop with CECOMA personnel	SIAPS team	August 2014	SIAPS team	Training handouts distributed to all trained staff	All LMIS staff trained	

ACTIVITY	PHASE	RATIONALE	DESCRIPTION	LEAD	INDICATIVE TIME FRAME	RESOURCES NEEDED*	DELIVERABLES	EXPECTED ACHIEVEMENTS	COMMENTS
Strengthen quality of warehouse SOPs									
Incoporate input from CECOMA throughout the project	ALL	To create ownership of solutions	Consulting with CECOMA on a regular basis	Jonathan White	Thoroughout the project	SIAPS team	Meeting minutes	Continuous involvement with the project and eventual ownership	
Review existing SOPs and develop additional SOPs relevant to CECOMA	1	To create a consistent and standardized method of execution that is clear to all.	A workshop based capacity building approach involving CECOMA personnel developing SOPs that can be further developed by CECOMA as appropriate and rolled out throughout the country	Jonathan White	Feb 2014	English-Portuguese translation services	Full set of SOPs translated to Portuguese that will include areas such as picking, packing, receiving, safety, etc	Presence of SOPs that follow Good warehousing practices (GWP)	
Receiving	1	To create a consistent and standardized method of execution that is clear to all.	A workshop based capacity building approach involving CECOMA personnel developing SOPs that can be further developed by CECOMA as appropriate and rolled out throughout the country	Jonathan White	Feb 2014	SIAPS team	Revised SOP for receipt of goods	Presence of SOPs that follow Good warehousing practices (GWP)	
Storage and product location in the stores	1	To create a consistent and standardized method of execution that is clear to all.	A workshop based capacity building approach involving CECOMA personnel developing SOPs that can be further developed by CECOMA as appropriate and rolled out throughout the country	Jonathan White	Feb 2014	SIAPS team	Revised SOP for storage of goods	Presence of SOPs that follow Good Warehousing Practices (GWP)	
Preparing orders	1	To create a consistent and standardized method of execution that is clear to all.	A workshop based capacity building approach involving CECOMA personnel developing SOPs that can be further developed by CECOMA as appropriate and rolled out throughout the country	Jonathan White	Feb 2014	SIAPS team	Revised SOPs for picking & packing and checking orders	Presence of SOPs that follow Good Warehousing Practices (GWP)	
Despatching orders	1	To create a consistent and standardized method of execution that is clear to all.	A workshop based capacity building approach involving CECOMA personnel developing SOPs that can be further developed by CECOMA as appropriate and rolled out throughout the country	Jonathan White	Feb 2015	SIAPS team	Revised SOP for despatching orders	Presence of SOPs that follow Good warehousing practices (GWP)	
Rollout SOPs to all warehouses	2	To create a consistent and standardized method of execution that is clear to all.	Ensure that during workshops CECOMA central personnel have the ability to pass on the knowledge gained.	Jonathan White	Jun 2014	SIAPS team	Implementation plan to roll out and train staff on SOPs	All CECOMA warehouse staff will be trained, knowledgeable about the SOPs, and capable of implementing and revising/ developing SOPs in future	

ACTIVITY	PHASE	RATIONALE	DESCRIPTION	LEAD	INDICATIVE TIME FRAME	RESOURCES NEEDED*	DELIVERABLES	EXPECTED ACHIEVEMENTS	COMMENTS
Optimize the warehouse layout to improve processes									
Incoporate input from CECOMA throughout the project	ALL	To create ownership of solutions	Consulting with CECOMA on a regular basis	Jonathan White	Thoroughout the project	SIAPS team, Stakeholders	Meeting minutes	Continuous involvement with the project and eventual ownership	
Review warehouse layout	1	To investigate the possibility of improving product flows		Jonathan White	Feb 2014	Guide	Critical analysis of current layout		
Reorganize warehouse layout	1	To improve product flows	Change the warehouse layout to improve product flows	Jonathan White	Feb 2014	Data: Throughput by product	Creation of plans to optimize commodity layout		
Implement warehouse layout changes	2	To put into practice identified improvements		SIAPS	Feb 2014		Project plan that lists activities and projected timelines		
Review existing SOPs and develop additional SOPs relevant to CECOMA	1	To create a consistent and standardized method of execution that is clear to all.	A workshop based capacity building approach involving CECOMA personnel developing SOPs that can be further developed by CECOMA as appropriate and rolled out throughout the country	Jonathan White	Feb 2014	Existing CECOMA SOPs; sample SOPs prepared by consultant	Full set of SOPs translated to Portuguese that will include areas such as picking, packing, receiving, safety, etc	Presence of SOPs that follow GWP	
Basic inventory management practice	1	To create a consistent and standardized method of execution that is clear to all.	A workshop based capacity building approach involving CECOMA personnel developing SOPs that can be further developed by CECOMA as appropriate and rolled out throughout the country	Jonathan White	Feb 2014	SIAPS team	SOPs for: Stock control, cycle counting and validation	Presence of SOPs that follow GWP	
Recording	1	To create a consistent and standardized method of execution that is clear to all.	A workshop based capacity building approach involving CECOMA personnel developing SOPs that can be further developed by CECOMA as appropriate and rolled out throughout the country	Jonathan White	Feb 2014	SIAPS team	Identified shortcomings in warehouse layout	Presence of SOPs that follow GWP	
Processing orders	1	To create a consistent and standardized method of execution that is clear to all.	A workshop based capacity building approach involving CECOMA personnel developing SOPs that can be further developed by CECOMA as appropriate and rolled out throughout the country	Jonathan White	Feb 2014	SIAPS team	Identified shortcomings in LMIS structure	Presence of SOPs that follow GWP	

ACTIVITY	PHASE	RATIONALE	DESCRIPTION	LEAD	INDICATIVE TIME FRAME	RESOURCES NEEDED*	DELIVERABLES	EXPECTED ACHIEVEMENTS	COMMENTS
Strengthen distribution and transportation management									
Gather input from CECOMA throughout this phase	ALL	To create ownership of solutions	Consulting with CECOMA on a regular basis	Jonathan White	Thoroughout the project	SIAPS team, Stakeholders	Meeting minutes	Continuous involvement with the project and eventual ownership	
Review existing SOPs and develop additional SOPs relevant to CECOMA	1	To create a consistent and standardized method of execution that is clear to all.	A workshop based capacity building approach involving CECOMA personnel developing SOPs that can be further developed by CECOMA as appropriate and rolled out throughout the country	Jonathan White	Feb 2014	English-Portuguese translation services	SOPs for: Driver instructions, vehicle checking and return of PODs	Presence of SOPs that follow GWP	
Development of distribution plan to include timing and fleet management	3	To create a plan that assists in the timely execution of delivery requirements	Collect existing data for the past 3 months and analyze.	Jonathan White	Mar 2014	Data: Stock reports by province for past 3 months	Distribution plan		

ACTIVITY	PHASE	RATIONALE	DESCRIPTION	LEAD	INDICATIVE TIME FRAME	RESOURCES NEEDED*	DELIVERABLES	EXPECTED ACHIEVEMENTS	COMMENTS
Build human resource capacityin warehousing and inventory management									
Create HR capacity development plan with input from CECOMA	ALL	To create ownership of solutions	Consulting with CECOMA on a regular basis	Jonathan White	Feb/Mar 2014	SIAPS team, CECOMA	HR development plan which includes on-the-job training, formal training program and timelines	Increased knowledge in warehouse management principles	
Integrating supply chain functions into the computerised system	2	To reduce the duplication of effort and reduce errors	Where necessary develop desktop tools to facilitate the inclusion of relevant data	Jonathan White	Throughout trip1		HR capacity requirements		
Implement HR capacity development plan	2	To increase the HR capacity of CECOMA		Jonathan White	Mar 2014	Abre van Buuren, Supply Chain Improvement Program, SIAPS	HR plan implemented		
Develop KPIs	1	To measure performance within CECOMA	Key performance indicators are used to measure the level at which the warehouse or system is performing	Abre van Buuren	Feb 2014	Abre van Buuren, Supply Chain Improvement Program;	Suggested KPIs and method of calculation	Staff to be cognizant of performance measures and management to measure staff performance against KPIs	Used to measure baseline performance; National Supply Chain Assessment tool
Conduct a rapid baseline performance assessment of the CECOMA warehouse, using the developed KPIs	1	To measure performance within CECOMA	Key performance indicators are used to measure the level at which the warehouse or system is performing	Abre van Buuren	Feb 2014	Abre van Buuren; CECOMA staff; SIAPS team	Perfomance assessment results included to technical report of the STTA	Current preformance level of the CECOMA warehouse measured/quantified and data available for use as baseline against which to compare post-	
Conduct on the job performance improvement training with CECOMA warehouse staff	2	To provide theoretical and practical on-the-job training with CECOMA staff	The training has practical seminars for staff to learn Good Warehousing Practicies	Abre van Buuren	April/June 2014	SIAPS team, CECOMA, training logistics (i.e. venue, projectors, etc)	Training materials	Staff trained in good warehousing practices	

ACTIVITY	PHASE	RATIONALE	DESCRIPTION	LEAD	INDICATIVE TIME FRAME	RESOURCES NEEDED*	DELIVERABLES	EXPECTED ACHIEVEMENTS	COMMENTS
Performance monitoring									
Develop a plan of follow up actions and performance monitoring.	2	To provide a follow up plan for CECOMA to reach planned objectives		Jonathan White	Jun 2014	Abre van Buuren, SIAPS team	Activity plan to lists follow up actions and recommendations		
Provide ongoing TA to CECOMA to ensure the planned follow up actions are implemented and monitored accordingly.	3	To provide additional support to CECOMA	Additional TA on operations to help CECOMA reach previously outlined objectives	Jonathan White	Throughout the project	Abre van Buuren	Project plan that lists activities and projected timelines		

ACTIVITY	PHASE	RATIONALE	DESCRIPTION	LEAD	INDICATIVE TIME FRAME	RESOURCES NEEDED*	DELIVERABLES	EXPECTED ACHIEVEMENTS	COMMENTS
Other									
Conduct a post-intervention rapid performance assessment and analyze and compare the results with the baseline.	3	To measure and document performance and compare results through the TA	Rapid performance assessment is to be done across all technical areas	Jonathan White		SIAPS team	Baseline results, KPI measurements		
Adjust the follow up action plan as needed.	3	Update the action plan according to CECOMA's needs		Jonathan White; Abre van Buuren	Throughout the project	SIAPS team, CECOMA			
Develop project plan to acquire integrated enterprise level LMIS				SIAPS					Out of Jonathan White and IHS' scope
Develop project plan to create CECOMA governance body				SIAPS					Out of Jonathan White and IHS' scope

ANNEX B. WAREHOUSE MANAGEMENT STRUCTURE

Warehouse Management Structure

Introduction

This document has been prepared to provide a rationale for changing the management structure of CECOMA from a product-based structure to a function-based structure.

Rationale

The goal of most modern operations is to reduce costs by improving flexibility and increasing the use of assets while maintaining (and improving) customer service. The most costly asset at CECOMA is the warehouse itself. The next most costly asset is likely to be its personnel (ignoring the cost of products and the cost of transportation). Therefore, increasing the use of the warehouse and increasing the flexibility of personnel are two ways of improving the overall return on investment for CECOMA. Improving the flexibility of personnel will enhance the customer service element of the operation.

The current situation at CECOMA is that products are managed and stored by type. This means:

a) There is double handling of products to create space for new receipts.
b) To fulfill a particular customer order, a picker probably has to pick from every section of the warehouse.
c) Personnel become accustomed to handling a particular type of product and may not function as well in another area; in other words, flexibility is reduced.

A revised warehouse layout will ensure that the fastest moving products are stored closest to the dispatch area, thus reducing picking time. Not storing products of a particular type together in a section of the warehouse will reduce double handling, and thus reduce the overall warehouse workload.

A changed warehouse layout will allow for better use of available space and reduce double handling, and therefore, products should not be segregated by type. This scenario calls for a revised management structure for the warehouse operation.

NB If data are not going to be made available for the analysis, then I cannot suggest a revised layout and the revised “functions” arrangement may not be appropriate.

It is assumed that responsibility for inventory management lies with the Planning Department. If this is not the case, then an additional supervisor should be included, with the title of Stocks Supervisor and reporting to the Warehouse Manager.

ANNEX C. JOB DESCRIPTIONS FOR STAFF IN THE WAREHOUSING AND DISTRIBUTION DEPARTMENT OF CECOMA

Title: Warehouse Manager
Department: Warehouse
Location: Luanda Warehouse
Reports to: Director CECOMA

Purpose of the job:

To ensure that all warehouse and yard operations are managed in a safe and efficient manner.

To ensure that all warehouse operations are carried out in accordance with the requisite standard operating procedures.

Objectives/tasks:

- Manage the safe operation of the warehouse and yard.
- Coordinate short- and long-term labor requirements.
- Coordinate short- and long-term equipment requirements.
- Review staffing levels by function.
- Rotate staff, as necessary, in line with actual volumes.
- Monitor and manage team performance against the relevant KPIs.
- Ensure effective communication up, down, and across the business.
- Review KPIs and help to ensure that service and cost parameters are met.
- Be the first line of contact responding to employees' questions and addressing their concerns.
- Ensure that best practices are developed and used; constantly seek improvements to layout, efficiency, and stock integrity.
- Develop staff through training, mentoring, and personal development plans.
- Conduct daily, weekly, and monthly operations meetings to increase the efficiency of the operation.
- React appropriately and promptly to unexpected changes in sales and operational crisis situations.

Direct reports

- Warehouse Supervisor
- Dispatch Supervisor
- Receipts Supervisor

Title: Warehouse Supervisor
Department: Warehouse
Location: Luanda Warehouse
Reports to: Warehouse Manager

Purpose of the job:

To supervise the Warehouse Department, ensuring that there is sufficient manpower and equipment to carry out the expected tasks.

To ensure that all warehouse operations concerning the put away, storage, picking, and checking of goods are carried out in accordance with the requisite standard operating procedures.

Objectives/tasks:

- To deputize for the Warehouse Manager, whenever necessary.
- To attend daily, weekly, and monthly operations meetings, as required.
- To advise the Warehouse Manager of potential problems that are likely to occur because of the lack of manpower or equipment.
- To identify health and safety issues and bring them to the attention of the Warehouse Manager.
- To identify training requirements within the department.
- To supervise the staff of the Warehouse Department and provide coverage whenever it is required.
- To resolve problems on an hour-to-hour and day-to-day basis such that work is carried out smoothly.
- To organize staff such that the department is staffed throughout the day.
- To bring to the attention of the Warehouse Manager any discrepancies or other problems identified within the department.

Title: Receipts Supervisor
Department: Receiving
Location: Luanda Warehouse
Reports to: Warehouse Manager

Purpose of the job:

To supervise the Receiving Department, ensuring that there is sufficient manpower and equipment to carry out the expected tasks.

To ensure that all warehouse operations concerning the receipt of stock are carried out in accordance with the requisite standard operating procedures.

Objectives/tasks:

- To attend daily, weekly, and monthly operations meetings, as required.
- To advise the Warehouse Manager of potential problems that are likely to occur because of the lack of manpower or equipment.
- To identify health and safety issues and bring them to the attention of the Warehouse Manager.
- To identify training requirements within the department.
- To supervise the staff of the Receiving Department and provide coverage whenever it is required.
- To resolve problems on an hour-to-hour and day-to-day basis such that work is carried out smoothly.
- To organize staff such that the department is staffed throughout the day.
- To bring to the attention of the Warehouse Manager any discrepancies or other problems identified within the department.

Title: Receipts Clerk
Department: Receiving
Location: Luanda Warehouse
Reports to: Receipts Supervisor/Warehouse Manager

Purpose of the job:

To ensure that all warehouse operations concerning the receipt of stock are carried out in accordance with the requisite standard operating procedures.

Objectives/tasks:

- To ensure that a physical check of goods entering the warehouse agrees with the documentation provided by the supplier, by quantity and product.

- To ensure that goods entering the warehouse have sufficient shelf-life remaining as described in the guidelines for receiving stock.

- To carry out a visual check of the condition of cartons when they arrive and identify any cartons that do not meet the required standards.

- To bring to the attention of the Receipts Supervisor/Warehouse Manager any discrepancies or other problems identified before allowing the delivery vehicle to depart.

- To annotate the delivery documentation with all observations.

- To attach a pallet label to each pallet that includes:

    - Product name
    - Product code
    - Batch number
    - Expiry date

Title: Dispatch Supervisor
Department: Dispatch
Location: Luanda Warehouse
Reports to: Warehouse Manager

Purpose of the job:

To supervise the Dispatch Department, ensuring that there is sufficient manpower and equipment to carry out expected tasks.

To ensure that all warehouse operations concerning the dispatch of stock are carried out in accordance with the requisite standard operating procedures.

Objectives/tasks:

- To attend daily, weekly and monthly operations meetings, as required.
- To advise the Warehouse Manager of potential problems that are likely to occur because of the lack of manpower or equipment.
- To identify health and safety issues and bring them to the attention of the Warehouse Manager.
- To identify training requirements within the department.
- To supervise the staff of the Dispatch Department and provide coverage whenever it is required.
- To resolve problems on an hour-to-hour and day-to-day basis such that work is carried out smoothly.
- To organize staff such that the department is staffed throughout the day.
- To bring to the attention of the Warehouse Manager any discrepancies or other problems identified within the department.

Title: Dispatch Clerk
Department: Dispatch
Location: Luanda Warehouse
Reports to: Dispatch Supervisor/Warehouse Manager

Purpose of the job:

To ensure that all warehouse operations concerning the dispatch of stock are carried out in accordance with the requisite standard operating procedures.

Objectives/tasks:

- To check that a delivery vehicle is clean and in good condition before loading goods.
- To ensure that a physical check of goods leaving the warehouse agrees with the delivery note documentation provided by the Planning Department, by quantity and product.
- To ensure that the driver understands where his delivery points are.
- To check that the vehicle is secure after loading.
- To bring to the attention of the Dispatch Supervisor/Warehouse Manager any discrepancies or other problems identified before allowing the delivery vehicle to depart.
- To note the time of departure of the delivery vehicle.

ANNEX D. WAREHOUSE MANAGEMENT

Principles

- Communication
- Flexibility
- Responsibility
- Empowerment
- Effective delegation
- Accountability

Daily Warehouse Operations Meeting

- Before the start of each shift/day
- Maximum 30 minutes
- Present
  - Warehouse Manager
  - Warehouse Supervisor
  - Dispatch Supervisor
  - Receipts Supervisor

Agenda

- How many loads expected to arrive – by hour
- How many loads/vehicles expected to depart – by hour
- Availability of personnel
  - Holidays?
  - Sick?
- Allocation of fork lift trucks to each department
  - Receiving
  - Dispatch
  - Warehouse (put away)
- Allocation of warehousemen to each department
  - Unloading (receipt)
  - Loading (dispatch)
  - Picking (warehouse)

Weekly Warehouse Operations Meeting

- Each Friday at 15:00
- Maximum 30 minutes
- Present
  - Warehouse Manager
  - Warehouse Supervisor
  - Dispatch Supervisor
  - Receipts Supervisor

Agenda

- Review of expected workload for the following week
  - How many loads expected to be received? - daily
  - How many loads/vehicles expected to depart? – daily
  - How many people on holiday?
  - How many people on agreed absence?
- Review of operations for the current week:
  - Were there any issues?
  - What can be done to correct problems or ensure that issues don't arise again?

Work Plan (next week)

Week commencing:			
		Receipt (loads)	Dispatch (ctns)
Mon	AM	1	
	PM		50
Tue	AM		
	PM	2	30
Wed	AM	1	
	PM	3	100
Thu	AM		
	PM		50
Fri	AM	2	20
	PM		

Monthly Warehouse Operations Meeting

- During last week of a month
- Take minutes and distribute to attendees
- Allocate actions to specific personnel
- Maximum 1 hour
- Present
  - Director/Deputy Director
  - Warehouse Manager
  - Warehouse Supervisor
  - Dispatch Supervisor
  - Receipts Supervisor

Agenda

- Review of previous month's actions – completed/not completed
- KPIs
- Health and safety issues
- Training requirements
- Disciplinary issues
- General problems
- Communication issues

Monthly Management Meeting

- During last week of a month
- Take minutes and distribute to attendees
- Allocate actions to specific personnel
- Present
  - Director
  - Deputy Director
  - Heads of department
    - Warehouse
    - Statistics
    - Quality

Agenda

- Review of previous month's actions – completed/not completed
- KPIs
- Health and safety
- Training
- Communications
- Issues between departments
- Discipline
- Departmental issues during the previous month
- Program activity that will affect operations over the coming months

ANNEX E. BEST PRACTICES

Warehousing Best Practices

What is “warehousing”?

In a broad sense, warehousing is the receipt, storage, and dispatch of goods in a timely and cost effective manner. It includes housekeeping, safety, layout, quality control, stock management, etc.

For all elements of warehousing, a clear and fully defined procedure should be documented identifying the personnel (by title) responsible for each element, along with examples of the documentation involved.

To demonstrate “best practice,” the following should be present:

Receipt of Goods

- Advanced knowledge of goods due to arrive.
- Goods checked against expected receipts for quality and quantity.
- Errors identified by supplier and included in KPIs.
- Relevant personnel advised of the availability of goods.
- Goods requiring quality checks segregated.

Handling and Put Away

- Effective MHE capable of dealing with current and future requirements.
- Excellent housekeeping, including: clear work areas; products neatly stacked; temperature monitored on a regular basis; and moisture and dirt removed.
- A documented safety procedure resulting in an excellent record.
- Clearly zoned warehouse layout that minimizes picking time.
- Clearly and accurately marked products.
- Minimal or no damage on put away.

Storage and Inventory Control

- Ability to track products by batch number.
- Regular reviews of warehouse layout.
- Warehouse management system that includes **ALL** product data, including product temperature characteristics.
- Segregated areas for varying temperature requirements and high-value products.
- Regular planned and reconciled product cycle counts.
- Expired and damaged stock removed to a separate area.

Picking, Packing, and Checking

- Minimized travel time for pickers.
- Products to be picked shown in the order the picker will travel.

- Daily activity displayed for employees.
- Picking targets set for continuous improvement.
- 100% of orders checked for accuracy.
- Documentation signed off by picker and checker.

Dispatch

- Orders placed in a separate marshalling area.
- Orders marshalled and identified by outgoing vehicle.
- Orders include customer-specific instructions and contact details.
- PODs signed and returned in a timely fashion.
- Third-party carriers reviewed regularly for performance.
- Delivery discrepancies recorded by driver and customer.
- Advanced notification given to customers of expected delivery date.

Stock Counting

- Regular cycle counts conducted.
- Annual or semi-annual full inventory counts conducted.
- Immediate reconciliation of discrepancies and re-counts, as required.

Systems and Reporting

- Fully computerized records of all transactions.
- Single system.
- Product location control.
- Product master file, including unique product number and value.
- Supplier master file, including unique number.
- Service delivery point master file, including unique location number.
- Reports tailored to client requirements.
- Relevant KPIs indicating targets met or exceeded.

Safety and Product Security

- Products segregated by individual requirements, e.g., temperature.
- Adequate lighting, temperature, and humidity control.
- All employees supplied with safety clothing, e.g., high visibility vests, safety shoes, etc.
- MHE fitted with warning measures, e.g., flashing lights, horns, etc.
- Pests controlled, as appropriate.

Selected items from the principles above indicating “best practice” and what is addressed by the “best practice.”

Warehousing standard/principle	Best practice	Issues that the best practice addresses
Receipt of goods		
Advanced knowledge of goods due to arrive.	Dock appointments made through web-based transfer.	The ability to pre-plan distribution, particularly in out-of-stock situations. The ability to pre-plan labor to receive and offload goods.
Goods requiring quality checks segregated.	Separate, clearly marked location for products awaiting quality control checks.	Unchecked goods included in planning and delivery.
Handling and put away		
Clearly zoned warehouse layout.	All zones and locations clearly identified and linked to the WMS system.	Delays in picking time. Delays in put away time.
Excellent housekeeping, including clear work areas, products neatly stacked, temperature monitored on a regular basis, and moisture and dirt removed.	Air conditioning, temperature control, and dust control, with regular cleaning regimen.	The possibility of accidents. Damage to products.
Storage and inventory control		
Ability to track product by batch number.	Batch numbers included with all transactions in the WMS system.	Facilitates product recall in the event of errors.
Expired and damaged stock removed to a separate area.	Segregated from “good” stock and identified in the WMS system.	Removes the possibility of distribution of expired or under specification products.
Picking, packing, and checking		
Orders checked for accuracy.	100% of orders checked for accuracy and noted in the WMS system.	Incorrect quantities and products sent to customers.
Documentation signed off by picker and checker.	100% of picking documents checked and countersigned.	Provides an audit trail to identify errors and training needs.
Dispatch		
Orders include customer-specific instructions and contact details.	Delivery documents include ALL data relevant to the delivery and location.	Products delivered to the wrong customer.
PODs signed and returned in a timely fashion.	100% of PODs signed by the correct person, returned, and inputted into the WMS system. All PODs scanned and archived.	Reduces theft and mis-deliveries. Creates a clear audit trail.
Stock counting		
Regular cycle counts.	Cycle counts with regularity based on turnover data held in the WMS system.	Reduces pilferage. Regular physical checks on expiry dates.
Immediate reconciliation of discrepancies and re-counts, as required.	No discrepancies when physical stock is compared to WMS system book stock.	Identifies stock errors at the earliest opportunity and allows for early correction.
Systems and reporting		
Fully computerized records of all transactions.	WMS system	Reduces errors and reduces inconsistencies in reporting.
Single system	WMS system	Eliminates errors in data transfer from one system to another.
Safety and product security		
Pests controlled, as appropriate.	100% pest free	Reduces the possibility of product damage and

Warehousing standard/principle	Best practice	Issues that the best practice addresses
		contamination.
All employees supplied with safety clothing, e.g., high visibility vests, safety shoes, etc.	100% safety record	Employees are protected against accidents.

Most Important Points

Provision of a single WMS system that handles all transactions at all locations.

Temperature and humidity control at all locations.

Adequate space to store the maximum stock levels, as decreed by the stock holding policy.

ANNEX F. SOP WORKSHOP

Why have SOPs?

- So that everyone knows what is being done and why.
- So that a task is carried out in a consistent manner.
- So that new employees can understand the task they are having to complete and how to do it.
- So that anyone reviewing the operation can see what should be being done.

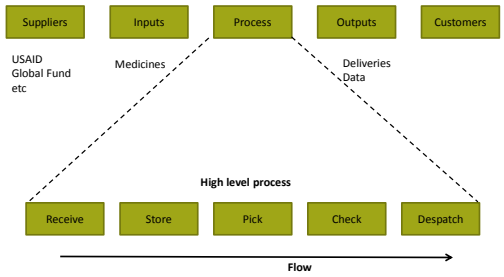
What should be included in an SOP?

- The reason for having a particular SOP
- A step by step description of the task.
- The titles of personnel included at each step of the procedure.
- An example of the documentation required at each step of the procedure.

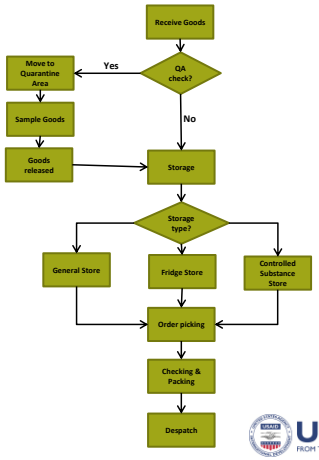
Step 1 - Create a SIPOC

- List the SUPPLIERS of information or product to the process (Who?)
- List the INPUTS to the process. (What?)
- Create a high level PROCESS map or flow chart. (What is happening?)
- Identify the OUTPUT from the process. (What?)
- Identify the CUSTOMERS of the process. (Who?)

Example Warehousing SIPOC



Step 2 – Expand the process flow



Exercise

- Select an area of the operation
- Write the description of the SOP
- Include who is responsible at each point
- Get example copies of the documentation that is being used

ANNEX G. KPI WORKSHOP AND SAMPLE DASHBOARDS

Key Performance Indicators (KPIs)

- We have looked at what data we think is available and easy to collect
- We have selected a number of KPIs that are meaningful to the CECOMA operation
- As time progresses you will find other KPIs that reflect the operation and that may be more useful to CECOMA management
- There should be a minimum of 3 and a maximum of 10 regularly produced KPIs

Why have KPIs?

- To record the activity of the operation
- To analyse the activity
- To use the results of the analysis to improve the operation over time

What activities should be monitored?

- Activities that affect the smooth running of the operation
- Activities that are costly and where a small change could affect the cost effectiveness of the operation
  - Picking accuracy
  - Order accuracy
  - Staff absence
  - Warehouse temperature

Collecting data and displaying KPIs

- For each of the selected KPIs a ***Numerator*** and ***Denominator*** have been identified
- A draft spreadsheet has been created to record the data and display results
- The daily and weekly data builds to weekly and monthly reports for CECOMA management.

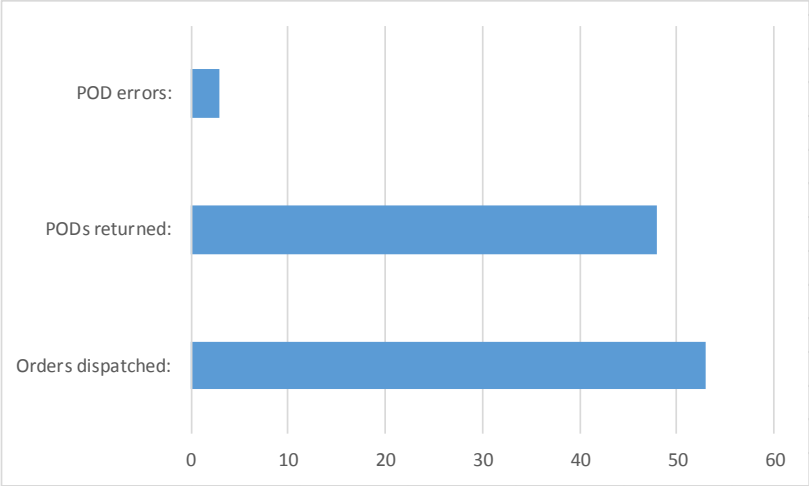
Data collection →

Dashboard →

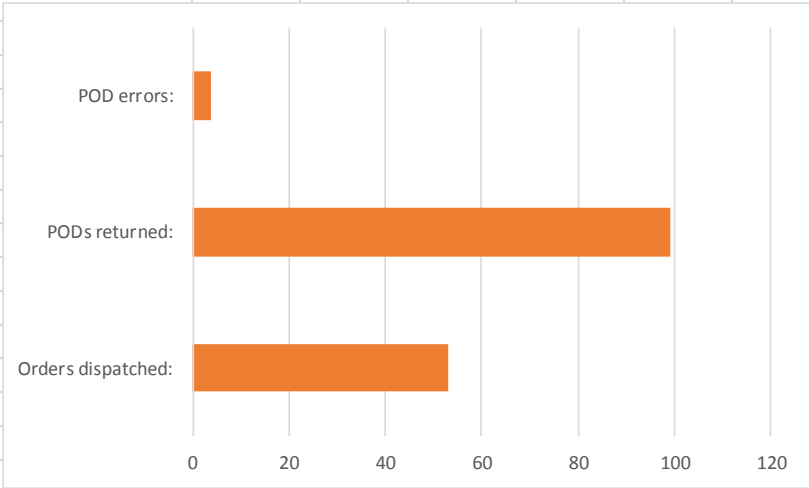
Example Dashboard
Weekly Delivery Notes
NB Data contained in these dashboards is fictitious

Delivery notes			
Week number:	3	All	
Orders dispatched:	53	53	
PODs returned:	48	99	
POD errors:	3	4	
			Standard
Return %	91%	187%	100%
Error %	6%	4%	0%

Delivery notes - Week 3



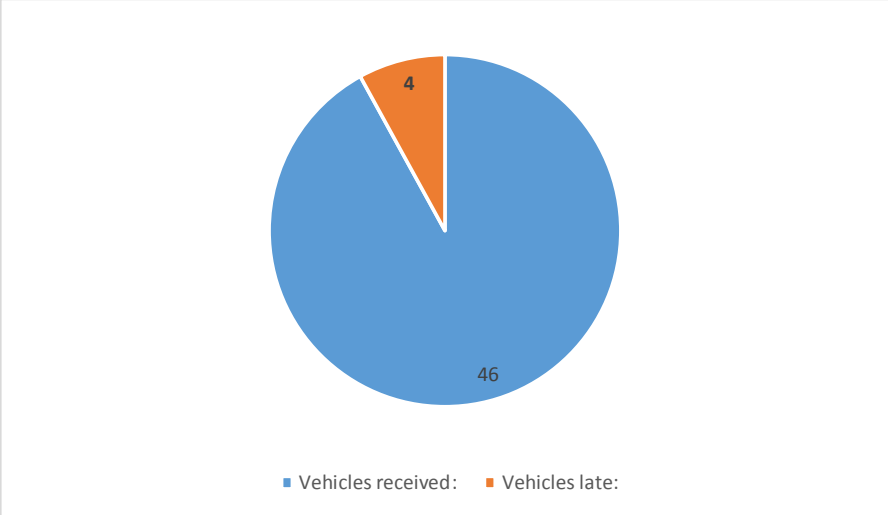
Delivery notes - cumulative



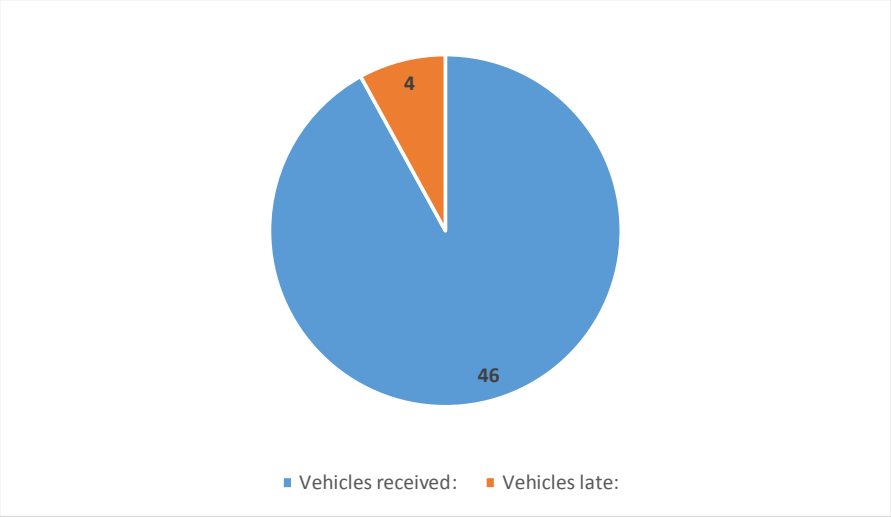
Example Dashboard
Monthly Receipt timeliness
NB Data contained in these dashboards is fictitious

Receipt timeliness			
Month number:	1	**All**	
Vehicles received:	46	46	
Vehicles late:	4	4	
			Standard
Late %	**9%**	**9%**	**0%**

Receipt timeliness - Month 1



Receipt timeliness - cumulative



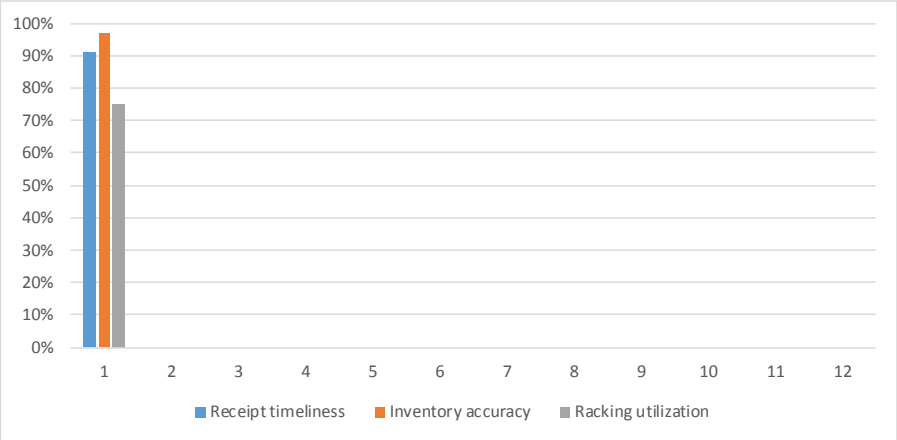
Example Dashboard
Monthly Cumulative results
NB Data contained in these dashboards is fictitious

Cumulative results

Standard		100%	100%	0.01%	80%

Month no.		Receipt timeliness	Inventory accuracy	Expired cases	Racking utilization
1		91%	97%	0.10%	75%
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					

Monthly results



ANNEX H. PRODUCT NUMBERING

The Objective

- Create unique product numbers for use throughout CECOMA
- Look at the options
- To create a simple, flexible and user friendly system
- Agree numbering system

Why is product numbering important?

- To facilitate the use of computers for analysis
- To provide consistency with naming
  - Paracetamol 500mg tablet
  - Paracetamol - 500mg tab
  - Paracet 500mg tab
  - etc etc
- To remove biases for origins
  - Brands
  - Country
  - Manufacturer

Product numbers

- Must be unique by:
  - Name
  - Dosage
  - Presentation
- Must be of a consistent length e.g. 5 digit
- Must be consistent in categorization
- Simplicity for the next number

Product numbering options

- Alphabetical
- Presentation and then alphabetical (current?)
- WHO Essential Medicines List
  - Category
  - Sub-category
  - Number within sub-category
  - Presentation
- ATC – DDD
  - Anatomical Therapeutic Chemical (ATC) and Defined Daily Dosage (DDD)

Example numbers – Paracetamol 500mg tabs

- 77122 (Kenya)
- 01-55 (CECOMA)
- 02010303 (WHO based)
- N02BE0102E (ATC-DDD Rwanda)
- MORAU – PARA – 500 – BTE – 1 (Burundi)

Recommendations

- Identifier for dosage form – 2 digit
- 4 digit number within group (alphabetical)
  - 01 – 0001
  - 01 – 0002
- New products – use next 4 digit number

ANNEX I. PALLET LOCATION SPREADSHEET GUIDE

Introduction

The pallet location spreadsheet is designed to maintain a record of the location of each pallet in the warehouse and to provide a quick reference on the closeness of products to their expiry dates.

As with any change in a process or the introduction of a new process, care should be taken to ensure that everything works as intended. To this end, a “pilot” should be implemented to test the process.

The spreadsheet should be updated by using several forms:

- Internal stock transfer form (new)
- Put away form (new)
- Pallet note (existing)
- Empty pallet location form (new)

Goods are received, dispatched, or moved from location to location each day. Therefore, it will be difficult to completely fill in the spreadsheet for use at a single point in time.

For the first month of using the spreadsheet, record “put away” goods, internal stock transfers, and the creation of empty pallet spaces. Following the subsequent stock take, complete the update to the spreadsheet.

The spreadsheet is made up of a number of individual sheets, as follows:

- Locations
- Product codes
- Lists
- Stock count

Locations Sheet

This sheet contains the record of all pallet locations, and includes the product code, group, product description, batch number, expiry date, number of days to expiry, and expiry flag. Columns B, E, and F are for data input. All other columns should not be altered in any way as they contain formulas or base information.

By entering a product code in column B, columns C and D are automatically updated with the information contained in the “product codes” sheet.

By entering an expiry date in column F, calculations in columns G and H are automatically updated.

Note: Column F must contain dates in a format recognized by Excel and **NOT** text.

Product Codes

This sheet contains a list of all products, their codes, product group, and product description. The sheet should be updated when new products are received.

Stock Count Sheet

This sheet contains a blank list of all pallet locations which, if required, may be used for the monthly stock take.

Lists

This sheet contains the data that is used to identify how close a product is getting to its expiry date.

Expiry flag	
-1000	red
90	amber
180	green

The current data in this sheet produces a “red” flag if the expiry date is less than 90 days away, an “amber” flag if the expiry date is between 90 and 180 days away, and a “green” flag if the product has more than 180 days of shelf-life remaining. Column A can be changed to suit the CECOMA operation.

Using the Forms – New Forms

Internal Stock Transfer Form (See Annex J)

This is a new form and should be used when stock is moved from one pallet location to another. It should identify the date the movement took place, the location that stock was moved from, the location that stock was moved to, the product code, the product description, the batch number, and the expiry date.

As soon as an internal movement takes place, the form should be signed and taken to the person responsible for updating the spreadsheet. This person will input the data to the spreadsheet, record the date of input, and sign the form. Paper records should be kept for a period of six months.

Notes: Internal movements of stock will decline as it will no longer be necessary to keep individual products in the same place.

Once the system is up and running, it should not be necessary to include the product description as the spreadsheet “looks up” the correct product description.

Put Away Form (See Annex J)

This form should be used when stock is first put away in the warehouse. It records the date the action took place, the product code, the product description, the batch number, the expiry date, and the location where the stock was stored.

Note: Once the system is up and running, it should not be necessary to include the product description as the spreadsheet "looks up" the correct product description.

Empty Pallet Location Form (See Annex J)

During the picking and dispatching process, pallet locations will become empty. Use this form to identify empty locations.

Stock Take Forms

Once the spreadsheet has been completed, it will be possible to print stock take forms that identify what product, batch number, and expiry date are in what location, which will mean that during a stock take, the products only need to be checked for identity and the quantity added.

Note: Any variations in the product expected at a particular location must be re-checked. If the location spreadsheet is found to be incorrect, it must be updated immediately.

Using the Forms - Existing Forms

Pallet Note

Upon receipt, each pallet should have a "pallet note" attached identifying the product, batch number, and expiry date (reference: Receipt SOP). In addition to this information, the product code should be included and the SOP changed to reflect this requirement.

The following forms should be redesigned to include a column for "product code":

- Goods received note
- Pre-dispatch form
- Delivery note

Note: This may mean a re-printing of the blank delivery notes, as the delivery note is a 7-part set.

Stock Take Forms

Once the spreadsheet has been completed, it will be possible to print stock take forms that identify what product, batch number, and expiry date is in what location, which will mean that during a stock take, the products only need to be checked for identity and the quantity added.

Note: Any variations in the product expected at a particular location during the stock count must be re-checked. If the location spreadsheet is found to be incorrect, it must be updated immediately.

ANNEX J. NEW DOCUMENTATION

Empty Pallet Location Form

Date	Empty location	Input date

Signed (Warehouse)
_____

Signed (Planning)
_____

Put Away Form

Date	Product code	Product description	Batch no.	Expiry date	Location	Input date

Signed (Warehouse) _____

Signed (Planning) _____

Internal Stock Transfer

Date	Location from	Location to	Product code	Product description	Batch no.	Expiry date	Input date

Signed (Warehouse) _____

Signed (Planning) _____

ANNEX K. SOP/KPI WORKSHOPS PARTICIPANTS

Product Numbering Workshop: June 4, 2014

SL#	**Name**	**Title**	**Organization**
1	Nair Analdina Siliveli Epalanga	Head of Quality Control	CECOMA- Angola
2	Iracelma Pinto Bravo Da Costa	Regional Warehouse	
3	Sonia Marisa Silvestre Garcia	Head of Planning and Statistics Dept	
4	Michael Gonzalez	Consultant – Planning Dept	
5	Maria Roberto Fernandes	Warehouse Manager	
6	Juliana Ferreira	Deputy Director	
7	Jose Maria Pereira	Head of Technical and Quality Management	
8	Wonder Goredema	Senior Technical Advisor	USAID/SIAPS - USA
9	Jonathan White	Consultant	IHS - UK
10	Patrick Gaparayi	Senior Technical Advisor	USAID/SIAPS-Angola
11	Michael Ofeke	Technical Advisor	

KPIs Workshop: June 5, 2014

SL#	**Name**	**Title**	**Organization**
1	Iracelma Pinto Bravo Da Costa	Regional Warehouse Coordinator	CECOMA- Angola
2	Sonia Marisa Silvestre Garcia	Head of Planning and Statistics Dept	
3	Maria Roberto Fernandes	Warehouse Manager	
4	Juliana Ferreira	Deputy Director	
5	Wonder Goredema	Senior Technical Advisor	USAID/SIAPS - USA
6	Jonathan White	Consultant	IHS - UK
7	Patrick Gaparayi	Senior Technical Advisor	USAID/SIAPS-Angola
8	Michael Ofeke	Technical Advisor	

Second SOP Workshop: June 9, 2014

SL#	**Name**	**Title**	**Organization**
1	Iracelma Pinto Bravo Da Costa	Regional Warehouse Coordinator	CECOMA- Angola
2	Sonia Marisa Silvestre Garcia	Head of Planning and Statistics	
3	Maria Roberto Fernandes	Warehouse Manager	
4	Juliana Ferreira	Deputy Director	
5	Jose Maria Pereira	Head of Technical and Quality Management	
6	Wonder Goredema	Senior Technical Advisor	USAID/SIAPS - USA
7	Jonathan White	Consultant	IHS - UK
8	Patrick Gaparayi	Senior Technical Advisor	USAID/SIAPS-Angola
9	Michael Ofeke	Technical Advisor	

Debrief with CECOMA Director and key technical staff: June 13, 2014

SL#	**Name**	**Title**	**Organization**
1	Dr. Mateus Fernandes	Director	CECOMA- Angola
2	Nair Analdina Siliveli Epalanga	Head of Quality Control	
3	Iracelma Pinto Bravo Da Costa	Regional Warehouse Coordinator	
4	Sonia Marisa Silvestre Garcia	Head of Planning and Statistics	
5	Michael Gonzalez	Consultant – Planning Dept	
6	Maria Roberto Fernandes	Warehouse Manager	
7	Juliana Ferreira	Deputy Director	
8	Jose Maria Pereira	Qualidadehead of Technical and Quality Management	
9	Wonder Goredema	Senior Technical Advisor	USAID/SIAPS - USA
10	Jonathan White	Consultant	IHS - UK
11	Patrick Gaparayi	Senior Technical Advisor	USAID/SIAPS-Angola
12	Michael Ofeke	Technical Advisor	

ANNEX L. CHECKLIST

Checklist for Internal Audit of Self Inspection of the Depot

Area inspected			**Date**
Organization and management	**Yes**	**No**	
Is the Depot appropriately licensed with the regulatory authority to perform the intended functions in terms of the applicable legislation?			
Is the name of the responsible pharmacist displayed over the main entrance?			
Is the name of the pharmacist on duty displayed in the Depot?			
Is the distributor operations conducted under the constant personal supervision of a pharmacist?			
Is a Site Master file available for the Depot?			
Is an appropriate organogram provided at every level of the distribution chain?			
Are letters of appointment available for the key supervisory personnel?			
Personnel			
Is there an induction/orientation-training program available for new employees? (personnel handbook, policy and procedure manuals)			
Are personnel subjected to formal in-service quality-awareness training programs/refresher courses at planned intervals? – Are training manuals available?			
Does the training program at least cover: • SOP training • Legal requirements within the workplace? • Critical tasks? • Good housekeeping practices? • Health and hygiene? • Replenishment, picking, checking and packing? • Safety management and personal protective equipment? • Emergency procedures? • Contamination and cross-contamination? • Good vaccine storage and transport techniques? • Security?			
Is there a written training program including subjects to cover, frequency and assessment?			
Are training records filed on each employee's file?			
Are current and authorized job descriptions available for key personnel?			
Are there sufficient suitable qualified and trained personnel at all levels?			
Are personnel issued with Personal Protective Equipment (e.g. protective clothing, hand gloves, respiratory masks, eye goggles or hard hats) for the safe handling of pharmaceutical goods where applicable?			
Procurement of medicines			
Are goods purchased only from legitimate manufacturers or other authorized sources to ensure traceability and confidence in the quality of pharmaceutical products?			
Is a Quality Manual available?			
Does the organogram include key supervisory/control personnel? Are the responsibility, authority and interrelationships of all personnel clearly defined?			
Premises, warehousing and storage			
Is access to the Receiving Department secure and restricted to authorized persons only?			
Do receiving bays protect deliveries from bad weather during unloading?			
Are these areas effectively separated and clearly defined?			
Is the receiving area designed and equipped to allow the cleaning of containers of incoming goods, if necessary, before storage?			

Is there a receiving team available during receiving? (Supervisor/pharmacist, receiving clerks, of loaders/loaders, forklift operators, cleaners, security)?			
Is all staff of the receiving team trained in the correct receiving procedures?			
Is material handling equipment available at receiving? (Forklifts, pallet trucks)			
Is safety equipment available at receiving? (loaders, protective clothing, safety shoes, hard hats, gloves, eye protection, fire extinguishers)			
Are first-aid procedures and equipment for dealing with emergencies involving personnel at receiving available?			
Are special handling instructions followed in respect of narcotic/psychotropic/hazardous, flammable, fragile and thermolabile products?			
Are goods and delivery vehicles examined for signs of possible external contamination?			
Are incoming goods checked for quantity, quality, damaged containers, type, conditions and expiry dates?			
Are the delivery note and invoices compared to a valid purchase order?			
Does the receiving clerk check the consignment against the delivery note for the following: • The identity of the stock? • The batch numbers of the stock? • The expiry dates of the stock? • The pack size? • The gross condition of the stock? • The quantity of the stock received? • The supplier's details? • The signature of the person who received the stock?			
Is a "discrepancy report" filled in for all defective products received? (integrity, short-dated, expired, broken, leaking, damaged, short/over supply)			
Are special handling instructions followed in respect of narcotic, psychotropic and thermolabile products?			
General storage area			
Are the storage areas of sufficient capacity to allow orderly storage of the various categories of products, namely products in quarantine, released, rejected, returned or recalled products?			
Are there any open drain channels in the floor?			
Are the premises clean and floors durable and easily cleanable?			
Are walls all solid and sealed?			
Is the premises constructed in such a way to prevent infestation by vermin and pests?			
Is waste material collected in suitable containers (with closable lids) for removal to dedicated collection points at regular intervals?			
Are goods adequately protected from light, heat and humidity?			
Are the floor areas sufficient and organized to facilitate adequate security, efficient flow of work and people, effective communication/supervision and optimum service delivery to clients?			
Is there a Fire Safety Procedure available?			
Is there sufficient fire-fighting equipment available, both inside and outside the building?			
Are emergency exits clearly marked?			
Are emergency exits regularly checked to ensure that they are not blocked or inaccessible?			
Are sufficient smoke detectors available?			
Are the fire extinguishers serviced every 12 months?			
Are fire drills executed at least once per month?			
Is the fire alarm linked to the local fire brigade?			
Do the premises have a First Aid Box complying with the specifications?			
Are storage areas provided with adequate lighting to enable all operations to be carried out accurately and safely?			

Are Material Safety Data Sheets (MSDS) available for each type of product stored in the warehouse?			
Is a Chemical Spillage Kit available? (Is a SOP available on the cleanup of any spillage to ensure complete removal of any risk of contamination)			
Are all pharmaceutical products handled and stored in such a manner to prevent contamination, mix-ups and cross-contamination?			
Are forklifts, hand trucks, cranes, hoists operated by trained operators only?			
Are the storage areas of sufficient capacity to allow orderly storage of the various categories of products, namely products in dedicated, demarcated areas • Goods receiving? • Goods in quarantine? • Goods released? • Goods rejected? • Goods returned? • Goods recalled? • Thermolabile storage? • Narcotic/psychotropic/high risk medicines? • Dispatch?			
Are storage conditions for pharmaceuticals in compliance with the labeling/package insert, which is based on the results of stability testing?			
Are medicines stored according to a system (e.g. computerized or bin card system)? Also in various stores or sections.			
Are all goods stored off the floor, on pallets, shelves in cupboards or pick flow racks, suitably spaced to permit cleaning and inspection?			
Are pallets kept in a good state of cleanliness and repair?			
Is enough space provided between storage and outside walls to allow access for rodent/insect control, cleaning and firefighting equipment and materials?			
Is the warehouse dedicated to “approve” saleable stock only? Is physical or other validated segregation (e.g. electronic) provided for the storage of rejected, expired, recalled or returned products?			
Are broken or damaged items withdrawn from usable stock and separated?			
Is the temperature in the warehouse according to specifications?			
Are calibrated temperature recorders/maximum-minimum thermometers used to record the temperature?			
Are the temperatures of the warehouse monitored with calibrated temperature monitors and recorded twice a day?			
Are flammable substances (e.g. Ether) stored in separate outdoor flammable store located away from the main building and pathways?			
Are any expired/short dated (3 months) medicines on the shelves?			
Termolabile store			
Are thermolabile medicines stored in a fridge/cold room?			
Only medicines are stored in the fridge/cold room?			
Are thermolabile medicines stored according to a document driven system and SOP?			
Is the consignment of vaccines checked on receipt and transferred to the fridge/cold room immediately?			
Does the Warehouse Designate check the temperature monitor indicator within the cooler box to ascertain whether the delivery was maintained and received within the prescribed requirements of 2°C - 8°C?			
Does the Warehouse Designate record all these details on the Cold Chain Maintenance log?			
Is the fridge/cold room in working order and maintained regularly as per contract? Is maintenance recorded?			
Are vaccines stored in the middle shelves of the fridge? (avoid placing stock on door, top and bottom shelves)			
Are temperatures monitored in the fridge/cold room with calibrated temperature recorders/maximum-minimum thermometers and recorded twice daily? Temperature logs?			

Is an adequate warning system in place to indicate power, fridge or cold room failure?			
Is a back-up generator in place for the fridge/cold room?			
Is the back-up generator tested at least once per week?			
Are procedures in place for maintaining the cold chain in the event of fridge failure?			
Are vaccines quarantined after a “cold chain failure” and is the “cold chain variance form” complete?			
Are the temperature recorders/ maximum-minimum thermometers in the fridges/cold room and cool boxes calibrated at defined intervals?			
Inventory management			
Is there an effective stock control system in pace to prevent wastage through expiry, theft and fraud?			
Is inventory rotated on a FEFP/FIFO basis?			
Are cyclical stock counts done on a regular basis, according to written procedures? Is the actual and recorded stocks compared?			
Are all significant stock discrepancies investigated as a check against inadvertent mix-ups and/or incorrect issue?			
Are all real-time computerized inventory records kept?			
Are inventory records batch-specific (to enable tracing the chain of supplies)?			
Are the batch numbers of goods dispatched by the company recorded on invoices (for traceability)?			
Are medicines supplied into the retail sector to authorized clients?			
Are there up-to-date lists of registered hospitals, pharmacies, veterinarians and licensed dispensing practitioners (client validity)?			
Returned goods			
Is there a written SOP or document-driven system for the handling of returned goods?			
Are all the examination, assessment and decisions regarding the integrity of the returned goods channeled through a pharmacist?			
Are returned goods separated from saleable stock until their final disposal?			
Are batch-specific records kept on all goods returned?			
Does a designated pharmacist formally release goods for return to stock?			
Damaged or rejected goods			
Is there a written procedure in place for the handling of damaged and/or broken containers? Is particular attention paid to potentially toxic and hazardous products?			
Is there an SOP and recording system for control or rejected goods under a quarantine system to prevent their use until a final decision is taken on their fate?			
Quarantine area			
Is there a written SOP for the isolation and control of goods in quarantine?			
Is a dedicated quarantine area of sufficient capacity available?			
Are quarantined goods clearly identified as such?			
Are adequate security measures in place to control the movement of stock in the quarantine area?			
Is a designated person in charge of this area?			
Are records kept of goods in quarantine?			
Vehicles and equipment			
Are the vehicles that are used for the delivery of pharmaceutical products dedicated and appropriately protective of the products to prevent exposure to conditions that could affect their stability and packaging integrity, and prevent contamination of any kind?			
Does the design and use of the vehicles and equipment aim to minimize the risk of errors and permit effective cleaning in order to avoid contamination, build-up of dust or dirt and/or any adverse effect on the quality of pharmaceutical products being distributed?			
Are there procedures in place for the operation and the maintenance of all vehicles and equipment involved in the distribution process, including cleaning and safety precautions?			

Where special storage conditions (e.g. temperature and/or relative humidity) are required during the transit of medicines, are these storage conditions provided, checked, monitored and recorded?			
Are equipment used for monitoring conditions within vehicles and containers e.g. temperature and humidity, calibrated?			
Are there vehicles and containers of sufficient capacity to allow for orderly storage of various categories of pharmaceutical products during transportation?			
Shipment containers			
Are thermolabile products dispatched in cold chain containers?			
Is special care used when using freezer packs to ensure that the pharmaceutical product does not come into contact with the freezer pack, as it may have an adverse effect on the quality of the product?			
Are all pharmaceutical products stored and distributed in containers that do not have an adverse effect on the quality of the products, and offer adequate protection from external influences, including microbial contamination?			
Are labels applied to the container clear, permanently fixed to the container and indelible? Does the information on the label comply with applicable national legislation with regard to the labeling of containers?			
Are special transport and/or storage conditions stated on the label?			
Dispatch control			
Is there a written SOP relating to the control of goods dispatched to the clients?			
Does the SOP require that client validity/authority to acquire such products be verified?			
Do dispatch bays protect deliveries from bad weather during loading?			
Is there a current list of approved, valid customers?			
Are records for the dispatch prepared and does it include the following information: • Date of dispatch? • Name and address of suppliers? • Name and address of addressee? • A description of the products? • Assigned batch number and expiry date? • Applicable transport and storage conditions? • Unique number to allow identification of the delivery order?			
Are the vehicles and containers loaded carefully and systematically on a first out/last-in basis in order to save time when unloading and to prevent physical damage?			
Does the packaging material used adequately protect goods whilst in transit?			
Are suitable procedures in place to clean up spillages in the transport vehicle as soon as possible to prevent possible contamination and cross contamination?			
Has the designated personnel of the Depot courier service been trained in “cold chain management” of the transport of thermolabile products?			
Are suitable procedures used to maintain the cold chain? (suitable coolants, insulation material)			
Are thermolabile products adequately protected from being compromised? (products/temperature probes are wrapped in bubble packs and isolated from freezer blocks)			
Are written procedures in place to investigate and deal with any “cold chain failure” and is a “cold chain variance form” completed?			
Transportation and products in transit			
Are suitable procedures (e.g. suitable coolants) used to maintain the cold chain during the transport process for cold chain products?			
Has the transport process for cold chain products been validated to maintain the thermolabile products at 2°C-8°C for the duration of the trip?			
Does the manufacturer communicate all relevant conditions for storage and transportation to the entities responsible for the transportation of pharmaceutical products? (labeling & package insert)?			
Are cold chain products transported being preserved?			

The specific storage conditions of the product are not grossly exceeded or exceeded for an unacceptable length of time?			
Are products transported in such a way that: • The identification of the product is not lost? • The product does not contaminate, and is not contaminated by, other products or materials? • Adequate precautions are taken against spillage or breakage? • The specific storage conditions of the product are not compromised?			
Documentation:			
Are documents, and in particular instructions and procedures relating to any activity that could have an impact on the quality of pharmaceutical products, designed, completed, reviewed and distributed with care?			
Are the title, nature and purpose of each document clearly stated? Are the contents of the documents clear and unambiguous? Are documents laid out in an orderly fashion and easy to check?			
Are all documents completed, approved, signed (as required) and dated by an appropriate authorized person(s) and should not be changed without the necessary authorization?			
Do the nature, content and retention of documentation relating to the distribution of pharmaceutical products comply with national legislative requirements? Where such requirements are not in place, are these documents retained for a period equal to the shelf-life of the products where applicable, plus one year?			
Does the distributor establish and maintain procedures for the identification, collection, indexing, retrieval, storage, maintenance, disposal of and access to all applicable documentation?			
Are all records easily retrievable, and stored and retained using facilities that are safeguarded against unauthorized modification, damage, deterioration and/or loss of documentation?			
Are documents reviewed regularly and kept up to date?			
Are records relating to storage of pharmaceutical products kept and readily available upon request in accordance with the WHO Guidelines on Good Storage Practice?			
Are procedures in place for temperature mapping, security services to prevent theft or tampering with goods at the storage facilities, destruction?			
In case of temperature-sensitive pharmaceutical products, are records of investigations and actions retained for at least one year after the expiry date of the product?			
Where the records are generated and kept in an electronic form, are backups maintained to prevent any accidental data loss?			
Does the holder of a distribution license keep records for any transaction in medical products received or dispatched containing at least the following information: • Date? • Name of the medical product? • Batch number and expiry date? • Copies of order forms, delivery notes, stores receipt and issue vouchers? • Quantity received? • Quantity supplied? • Name and address of the approved supplier or consignee?			
Standard Operating Procedures			
Does a SOP exist for the creation and updating of SOPs?			
Are all SOPs uniformly structured in a format including the: • Title?			
• Date of issue?			
• Policy and objective?			
• Scope?			

• References?			
• Delegation of responsibilities?			
• Abbreviations and definitions?			
• Action?			
• Revision history?			
• Addendum?			
• ISO format?			
Are all SOPs formalized? (signed, dated & initialed on each page by the responsible pharmacist and at least one of the other key personnel)			
Are the SOPs structured to allow the responsible pharmacist to exercise his legal responsibilities?			
Are the SOPs indexed for easy retrieval?			
Are all superseded “Master Copies” archived and “Controlled Copies” shredded?			
Are all SOPs available at their point of use?			
Are SOPs revised at least once every 2 years?			
Are SOPs practical and suitable?			
Is the SOP distribution list appropriate?			
Are there at least SOPs to cover: • How to create and update an SOP?			
• Self-inspection (audits)?			
• Recall / Withdrawal of medicines from the market?			
• Handling of technical complaints?			
• Handling of returned goods?			
• Purchasing procedures			
• Receiving / Incoming goods control?			
• Disposal of rejected materials?			
• Rodent / Pest control?			
• Handling of counterfeit medicines?			
• Handling of goods in quarantine?			
• Personal health and hygiene?			
• Good housekeeping? Is there an SOP for cleaning of the receiving, storage, packing and dispatch areas in the warehouse as often as needed?			
• Security of stocks on site / consignments in transit?			
• Training of personnel?			
• Return of defective/non-defective products?			
• Handling of rejected goods?			
• Dispatch?			
• Cold chain maintenance?			
• Distribution control of SOPs?			
• Stock rotation / stock control?			
• Handling of scheduled medicines?			
• Temperature control of products?			
• Recording of storage conditions?			
• Checking validity of clients?			
• Planned preventative maintenance?			
• Counterfeit medicines?			
Technical Complaints			
Is there a written SOP for handling technical complaints?			
Has the company recently reported a product complaint?			
Are technical complaints recorded, followed up and a final report issued?			
Recalls			
Does the SOP for the recall of medicine include emergency and after hour contact persons and telephone numbers?			
Does it include a dummy letter that includes name of product, including INN and trade name, strength and pack size, batch number, main therapeutic class, nature			

of the defect, reason for the recall, date of recall, action to be taken and urgency?			
Is there a separate area for recalled goods awaiting further discussion?			
Is the progress of the recall recorded and a final report issued, including reconciliation between the delivered and recovered quantities of the products?			
Are the Regulatory Authorities of all countries to which products have been distributed informed?			
Good housekeeping			
Is there an SOP for cleaning of the receiving, storage, packing and dispatch areas in the warehouse as often as needed?			
Are storage areas kept clean and free from accumulated waste and vermin?			
Is a written sanitation program (cleaning schedule) for the warehouse available and recorded? Are the cleaning logs available?			
Is there suitable equipment (brooms, mops, bins, scoops, etc.) available to carry out effective cleaning routines?			
Personal health and hygiene			
Are pre-employment health checks carried out prior and during employment at regular intervals?			
Are records kept of all health checks of each employee?			
Are all personnel training in the practices of personal hygiene?			
Is the prescribed level of personal hygiene maintained by all persons who come into direct contact with the medicines in the distribution process, whether they are temporary or full-time employees or non-employees e.g. contractors or visitors?			
Are changing rooms and toilets available?			
Are changing rooms and toilets separate from the warehouse areas?			
Is smoking, eating, drinking, chewing and keeping plants, food, drink, smoking material and personal medication in the warehouse prohibited?			
Pest control			
Is there an SOP for pest control and elimination? (rodents, bats, birds, insects and termites)			
Is the pest-control agent used safe and registered with the Department of Agriculture for that purpose?			
Is there a floor plan available, indicating the position of the rodent bait stations?			
Is there a pest control contract in place with a registered service provider?			
Is the current contract managed?			
Internationally controlled substances			
Are internationally controlled medicines kept?			
Are narcotic medicines stored in compliance with International Conventions and National Legislation, Regulations on Narcotic Drugs?			
Is there an up-to-date register of all International Controlled medicines purchases and sales, which records: • The name and business address of the supplier? • The name and business address of the purchaser? • The date of each such transaction? • The quantities recorded or sold? • The balance held in stock at the end of each year?			
Are those records kept for at least 5 years after the last date of sale?			
Are psychotropic medicines stored in a restricted area and narcotic medicines locked away and keys under control of the pharmacist?			
Contract activities			
Are there signed and valid service level agreements available for: • Pest control			
• Collection of damaged/rejected pharmaceuticals for destruction?			
• For temperature mapping of the warehouse and fridge/cold room?			
• Security services to prevent theft or tampering with goods?			
• To provide and service fire-fighting equipment?			
• To service delivery trucks, forklifts, hand trucks, cranes, hoists at regular intervals?			

• To service all air conditioners in the warehouse at regular intervals?			
• To calibrate the temperature recorders/maximum-minimum thermometers in the warehouse, fridges/cool rooms as defined intervals?			
Self-inspection			
Is there a written SOP or document driven system for performing regular self-inspection audits?			
Is a self-inspection questionnaire/check list available?			
Are these results recorded in an audit report, followed up and the corrective measures implemented?			

ANNEX M. DAY-BY-DAY HRCD & PI ACTIVITIES

1. Tuesday, July 15:

    a. On site CECOMA: Revised KPI theory and template.
    b. Agreed on data points required.
    c. Matched KPI measures to the CECOMA organogram.

2. Wednesday, July 16:

    a. Introduced to CECOMA Directorate.
    b. Conducted practical sessions to extract data points from existing records to implement the KPIs into the daily, weekly, and monthly activities of the CECOMA staff.

3. Thursday, July 17:

    a. Demonstrated the input of the collected data into the KPI templates. Data are scarce, haphazard, and unreliable. There is seemingly no organizational culture of recorded measurements of key supply chain functions in CECOMA.

4. Friday, July 18:

    a. Training module:

        i. Good Warehousing Practices

    b. CECOMA staff were required to complete their daily tasks and responsibilities in addition to attending the training.

5. Monday, July 21:

    a. Training modules completed:

        i. Management & Supervision
        ii. Challenges in warehouse management
        iii. Situational analysis

6. Tuesday, July 22:

    a. Training modules completed:

        i. Warehouse design
        ii. Special requirements in warehouse management
        iii. Physical controls, safety and security

7. Wednesday, July 23:

    a. Training modules completed:

i. Cold chain
ii. Process flows
iii. Procurement
iv. Warehouse Management Systems (WMS) and Logistics Management Information Systems (LMIS), including the One Network eLMIS installation in Rwanda.

8. Thursday, July 24:

a. Met with Director & Deputy Director to review the data population to-date of the KPI templates and importance of the exercise in the future.
b. Suggested that a permanent diary event is introduced on a Monday to populate KPI measures every Monday morning.
c. Created input sheets to be completed on a daily basis by responsible section heads. Advised on a weekly meeting of Deputy Director with section heads to ensure KPI templates input.
d. Based on a discussion on human resources (HR), created a separate HR template for HR to complete.
e. Training modules completed:

i. Receiving
ii. Inventory control

f. Based on the training module presented on "Inventory Control," and while CECOMA claimed to perform a monthly stock count of every item in the facility, there seemed to be NO record of measurement of any inventory counts when asked. A separate KPI was created on inventory availability / stock-outs in the monthly KPIs template.
g. Practical Session: Based on the KPIs and organogram, the responsible persons in CECOMA were assigned the task of completing the KPI inputs for their respective areas and to return with the data on Friday, July 25.

9. Friday, July 25:

a. Entered KPI data points into KPI data entry templates.
b. We were able to collect certain data points from the CECOMA staff and complete certain parts of the KPI template. See Annexes P, Q and R.
c. Travelled back to South Africa.

ANNEX N. CECOMA HRCD & PI TRAINING CONTENT

Module No.	Warehouse Management & Operations	Training Status
Module 1	Procurement	Completed
Module 2	Receiving management	Completed
Module 3	Inventory control	Completed
Module 4	Warehouse layout and capacity	Completed
Module 5	Storage management and special requirements	Completed
Module 6	Cold chain	Completed
Module 7	Picking, Packing and checking	Completed
Module 8	Process flows	Completed
Module 9	Physical controls, safety and security in the warehouse	Completed
Module 10	Good warehousing and distribution practice	Completed
Module 11	Health and safety	Completed
Module 12	Risk management	Completed
Module 13	Challenges in warehousing	Completed
Module 14	Management and supervision	Outsourced by CECOMA
Module 15	Distribution	Completed
Module 16	Warehouse management systems	Completed
Module 17	Situation analysis and decision making process	

At the end of each module, the CECOMA participants were asked to make notes on the actions learned from the training materials and content that they believe should be implemented in the departments for which they have responsibility.

During a debriefing discussion with the CECOMA executive on July 24, 2014, a 100-day period was recommended for CECOMA to finalize their inputs from the training. SIAPS/Angola staff will assist the CECOMA staff, as needed and if possible.

ANNEX O. TRANSPORT OPERATIONS

The choices

All organizations that require the movement of goods from one point to another need vehicles to move those goods.

There are three basic choices:

1. A wholly in-house transport operation
2. A wholly sub-contracted transport operation
3. A mixture of the two options above

Table 1. Comparison of Transportation Options

Type of operation	Advantages	Disadvantages
1. In-sourcing	Total control	High "fixed" costs
	Deal directly with customers	High capital outlay
		No risk sharing
2. Outsourcing	Low "fixed" costs	Less control
	No capital outlay	Loss of personal touch
	Risk sharing	Financial stability
	Can focus on core competence	Disagreements over the perception of service quality
	Overall cost reduction	
	Improved flexibility	
	Access to additional resources	
3. Mixed operation	Sensitive parts of the operation can be controlled directly	"Fixed" cost level
		Capital requirements

Further choices may be made within each type of operation, as follows:

Table 2. Choices within each type of transport operation

Vehicles	Drivers	Maintenance	Breakdown	Tires
Purchase	Employed	In-house	In-house	Owned
Lease	Agency	Sub-contract	Sub-contract	Lease
Rent	None	None	None	None

Again, there are numerous permutations that can be considered.

Vehicle selection

In either the wholly in-house operation or the mixed operation, there is a need to acquire vehicles. The process described below identifies the questions that should be asked before acquiring the vehicles.

1. Determine the body size required:

- What weight will be carried in each load?
- What volume will be carried in each load?

Data from the operation should be reviewed and weights and volumes calculated.

2. What are the product requirements?

- Refrigeration
- Cooling
- Load restraints
- High security

What volume or weight of each product type will be transported?

3. Identify the expected working conditions of the vehicle:

- Rough terrain
- Urban deliveries
- Rural deliveries (unpaved roads)
- Long distance deliveries
- Rainy season; slippery, flooded roads
- Is a four wheel drive vehicle needed?
- Is side access needed?

4. Identify the driver/vehicle safety/comfort features required:

- Seat belts
- Air conditioning
- Radio
- Sprung or shock-absorbing seats
- Day cab or sleeper cab (sleeper cab provides a space for the driver to sleep)
- Reversing beepers
- Flashing safety lights
- Lights suitable for various visibility conditions

5. Identify any painting requirements:

- Company logo
- Appropriate paint scheme

6. Identify the most popular vehicles in the country of operation (these are likely to be the easiest to obtain spare parts for).

7. Tender to the manufacturers and ask for “whole life” costs:

- Spare parts availability
- Maintenance at what rate per km?
- Maintenance regularity
- Kilometers per liter (KPL)
- Buy back rates
- Purchase costs versus lease costs
- How could vehicle breakdowns be supported?

- What response time to breakdowns?
    - On the road
    - At base
- How many vehicles are required (more vehicles should equal a lower price per vehicle)?

8. General notes:

- Consult with the person responsible for transport in the particular operation.
- Consult with existing drivers at the operation (if any).
- Conduct a cost comparison between in-house and third-party transportation.

Selecting a third-party contractor (sub-contractor)

If the decision is made to outsource the transport operation to a third party (or to have a mixed operation), a list should be compiled of those companies that might be appropriate partners.

Once the list is compiled, a "request for information" (RFI) document should be sent to each of the companies on the list in order to judge interest in the contract.

The RFI should include the following information, at a minimum:

- A detailed description of the work to be carried out.
- The geographies to be covered.
- The type of products to be moved.
- The volumes to be moved.
- The number of deliveries to be made over a particular time span.

Once the expressions of interest have been received, a more detailed "request for quotation" (RFQ) should be sent to those companies that have passed the first hurdle in order to gauge:

- If the company can provide all the services required.
- Can the company provide the required service levels?
- Can the company cover all the geographies required?
- If the company has the technology required.
- Is the technology compatible with existing technology?
- Can the company react quickly to change, if required?
- If the company is financially sound and stable.
- What prices would be charged for the services?
- Can the company provide references from similar operations?

On the basis of the responses to these questions, an individual company can be selected. However, it may be more advantageous to select a number of companies to provide the services required, for example:

- One company to carry out urban deliveries.
- Another company to handle long distance deliveries.
- Another company to handle cold chain deliveries.

ANNEX P. KPI INPUT SHEET

CECOMA Input Sheets.xlsx

ANNEX Q. MONTHLY KPIS

Monthly KPIs_CECOMA Angol

ANNEX R. WEEKLY KPIS

Weekly KPIs_CECOMA Angol

ANNEX S. HR KPIS

HR_CECOMA v1.xlsx

ANNEX T. SUPPLIER PERFORMANCE

Supplier Performance_CECOM