

**Learning question:** How have systems thinking approaches and tools been incorporated in activities to improve health equity? Were these approaches useful in achieving health equity goals? If so, what are the pathways by which these approaches helped to address the root causes of inequity?



# HEALTH SYSTEMS STRENGTHENING ACCELERATOR

## The Role of Digital Technologies in Ensuring Access and Availability of Medical Supplies in Ethiopia

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### Context

- In Ethiopia, public health facilities sometimes fail to meet the health commodity needs of communities due to stockouts of essential medicines and supplies.
- Stock outs compromise the quality of services received by a client and result in poor care outcomes and frequently affect those most vulnerable of a community (the individuals using more remotely located sites, those who cannot afford further travel to find the medical products needed, the chronically ill and uninsured).
- Health system supply chains are also battling the issue of wastage of medical products due to expiries and damage, further affecting care outcomes, which wastes valuable resources within constrained settings.
- Preparing reporting and requesting forms (RRF) and submitting those forms to a supplier, in order to report stock and order commodities, requires time and resources. The ordering and delivery process is also prone to data errors.
- The supply chain system also suffers from poor distribution of medical products resulting in inequities of medical product availability.
- Lack of infrastructure and technologies prevented end-to-end visibility of the supply chain particularly for last mile health facilities in Ethiopia until recently.
- The USAID Digital Health Activity (DHA), a five-year USAID-funded flagship project implemented by John Snow, Inc (JSI), in collaboration with the Ministry of Health (MOH), implemented several strategies to strengthen Ethiopia's electronic logistic information system (eLMIS) to increase equity in product availability and decrease wastage within the supply chain.

### Activity Description

- USAID's DHA, in collaboration with MOH and other partners, leveraged existing tools and designed, developed, deployed, and scaled-up new tools to create an end-to-end supply chain system in Ethiopia.
- The tools included upstream (Vitas and Fanos) and downstream (Dagu, eAPTS and mBranas) digital tools, collectively called the electronic logistic management information system (eLMIS).

#### Upstream supply chain tools

- These are digital tools used at Ethiopian Pharmaceutical Supply Service (EPSS) and its 19 regional distribution hubs throughout the country.
- Vitas**
  - Vitas is an inventory and warehouse management tool used by EPSS to ensure that each facility has the commodities required to provide high-quality services.
  - Vitas controls inventory of health commodities, from receipt to issue, and manages movement and storage at EPSS center and hub warehouses.
  - It allows effective demand planning, resource management, warehouse management and inventory control of health commodities.
  - Vitas is interoperable with downstream supply chain tools: Dagu, a warehouse management tool at facility level, and mBranas, a vaccine management tool at woreda (district) health office level.

#### Fanos

- Fanos is a dashboard used at the EPSS center and its hubs that allows supply chain data visibility in real time through visual presentation of selected supply chain indicators.
- It supports procurement, supply, and distribution decision-making for all commodities managed by EPSS.

#### Downstream supply chain tools

##### Dagu

- A warehouse inventory management tool used at service delivery points to manage quantity and location of all health commodities.
- Enables submission of an electronic report and requisition form (eRRF). The eRRF removes the need to physically visit an EPSS hub to report on stock and order.
- It is interoperable with electronic auditable pharmaceutical transaction services (eAPTS), a dispensary unit application. The integration enables intra-facility visibility of stock status (e.g., the pharmacist can see what is being prescribed and its availability within the site's store).

##### eAPTS

- A facility level dispensary tool, designed to facilitate the transaction during medication dispensing and management at the dispensary unit (pharmacy/medical supply site) of a health facility. Prior to the deployment of eAPTS, manual payment processing took longer, shortening patient counseling time. The implementation of eAPTS reduced patient waiting time, enabling longer counseling sessions.

##### mBranas

- mBranas an application designed to manage vaccine and long-lasting insecticidal nets (LLINs) distribution and inventory at woreda levels.
- mBranas offers real time visibility of the stock status of vaccines and LLINs at the woreda level.
- It is also used to manage receipt and issue of vaccines and LLINs.
- mBranas generates electronic vaccine request forms (eVRF), enabling a rapid submission of supply requests electronically.

#### Ownership and sustainability of the system

- The MOH and DHA established a technical working group at the national level to provide high level leadership and governance of eLMIS and all related tools.
- From the onset of the project, to date, DHA has provided training to ensure pharmacists, health program leads, and supply chain employees knew how to use every one of these eLMIS tools.
- DHA also provided ongoing supervision and mentorship to provide tailored support to health facilities, EPSS and its hubs.

### Activity Impact

- Vitas streamlined supply management and allowed proactive and informed inventory control preventing over- and under-stocking, with better accuracy.
- Fanos allowed easy and real-time access to supply chain data for procurement, supply and distribution decision-making at EPSS and its hubs. Fanos also provided greater visibility into last-mile logistics at health facility level, which then led to an understanding of supply across regions and enabled supply to be better aligned with demand, enhancing equity.
- Dagu shortened activity processing time, increased last mile stock visibility, reduced wastage rate, and helped to save significant amounts of resources.
- eAPTS enabled pharmacy personnel to focus on patient counseling and reduced patient waiting time at dispensaries. It also improved the availability of medicines at the dispensary level due the integration between Dagu and eAPTS, which created greater visibility of stock in storage at dispensaries.
- mBranas ensured safe, efficient, and equitable rollout of LLINs and vaccines including the COVID-19 vaccine. It also provided information on routine immunization, COVID-19 vaccine and LLIN stock status, vaccine shipments ordered and received, total consumption, months of stock, ending balance, and potential expiry.

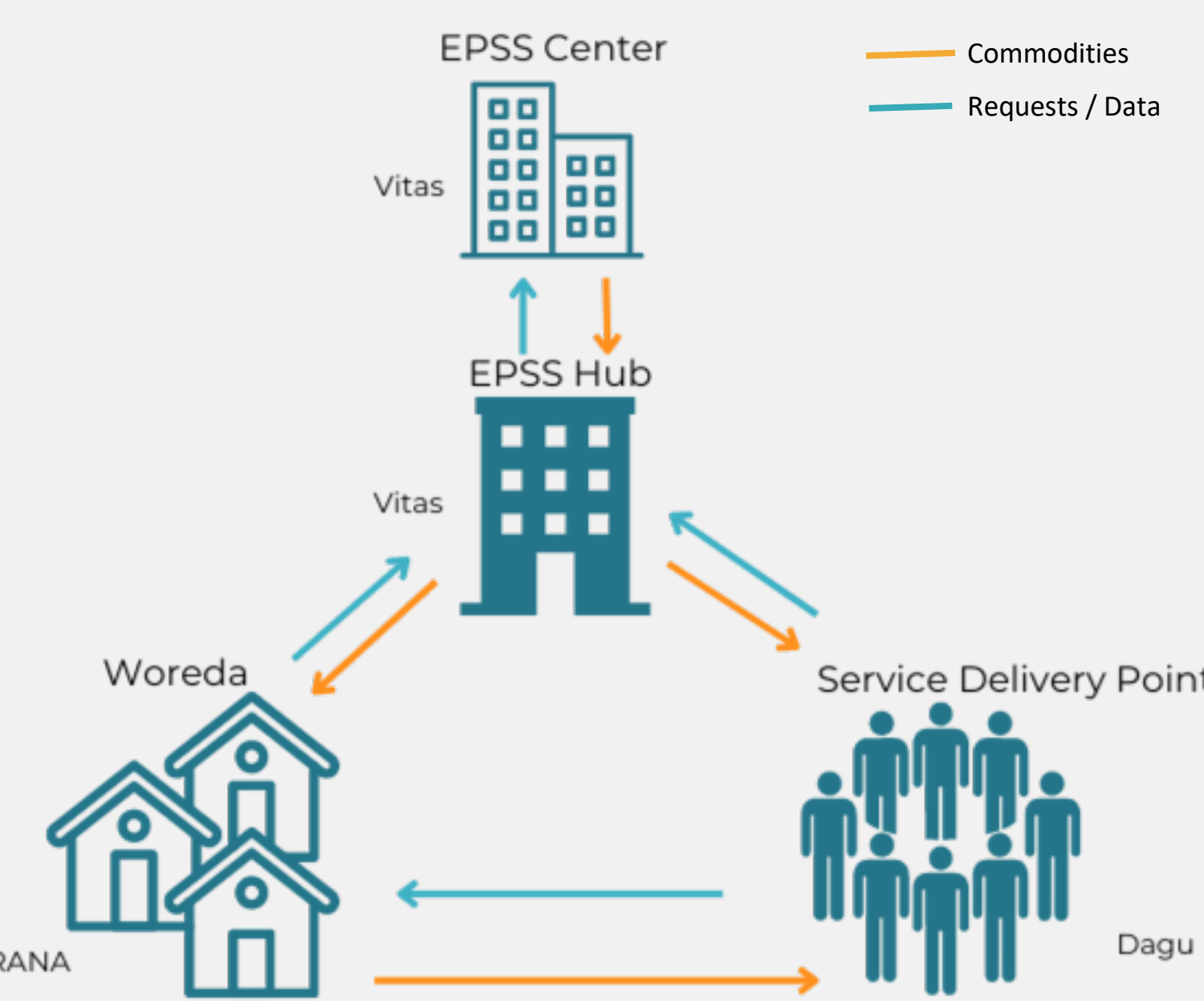


Figure 1: Upstream and downstream eLMIS tools implemented in Ethiopia

### Evidence

- DHA conducted a study in October 2022 to determine the effect of eLMIS on service quality. Six health facilities were grouped into three categories. Category I (those implementing Dagu and eAPTS integrated system), Category II (facilities implementing Dagu only) and Category III (health facilities not implementing either of the two systems). Two health facilities were included in the assessment in each category (1 hospital and 1 health center). The result showed that:
  - Availability of the tracer drugs, or essential medicines, was higher by 15.4% in Category I and II health facilities compared to Category III facilities.
  - Stock-out of tracer drugs in category III facilities (at least once in the last six months) was higher by 30.8% and 23% compared to Category I and II facilities, respectively.
  - Six-month wastage rate of tracer drugs due to expiration in Category III facilities was higher by 8.3% and 9.3% compared to wastage rate in Category I and II facilities, respectively.
  - The implementation of eLMIS in Category I and II health facilities saved Ethiopian Birr 1,115,662.39 (USD \$21,455.04) worth of health commodities in a six-month period, which would otherwise have been lost cost due to expiration.
  - 84% of eLMIS users (Dagu and eAPTS) surveyed indicated a high level of satisfaction with data quality and the eLMIS system.
- Dagu and eAPTS are deployed at 1,124 and 39 health facilities (hospitals and health centers), respectively.
- mBranas is deployed in 570 woredas. Using mBranas;
  - More than 52 million COVID-19 vaccine doses were distributed.
  - A total of 2.76 million LLINs were distributed to over 1600 health posts.

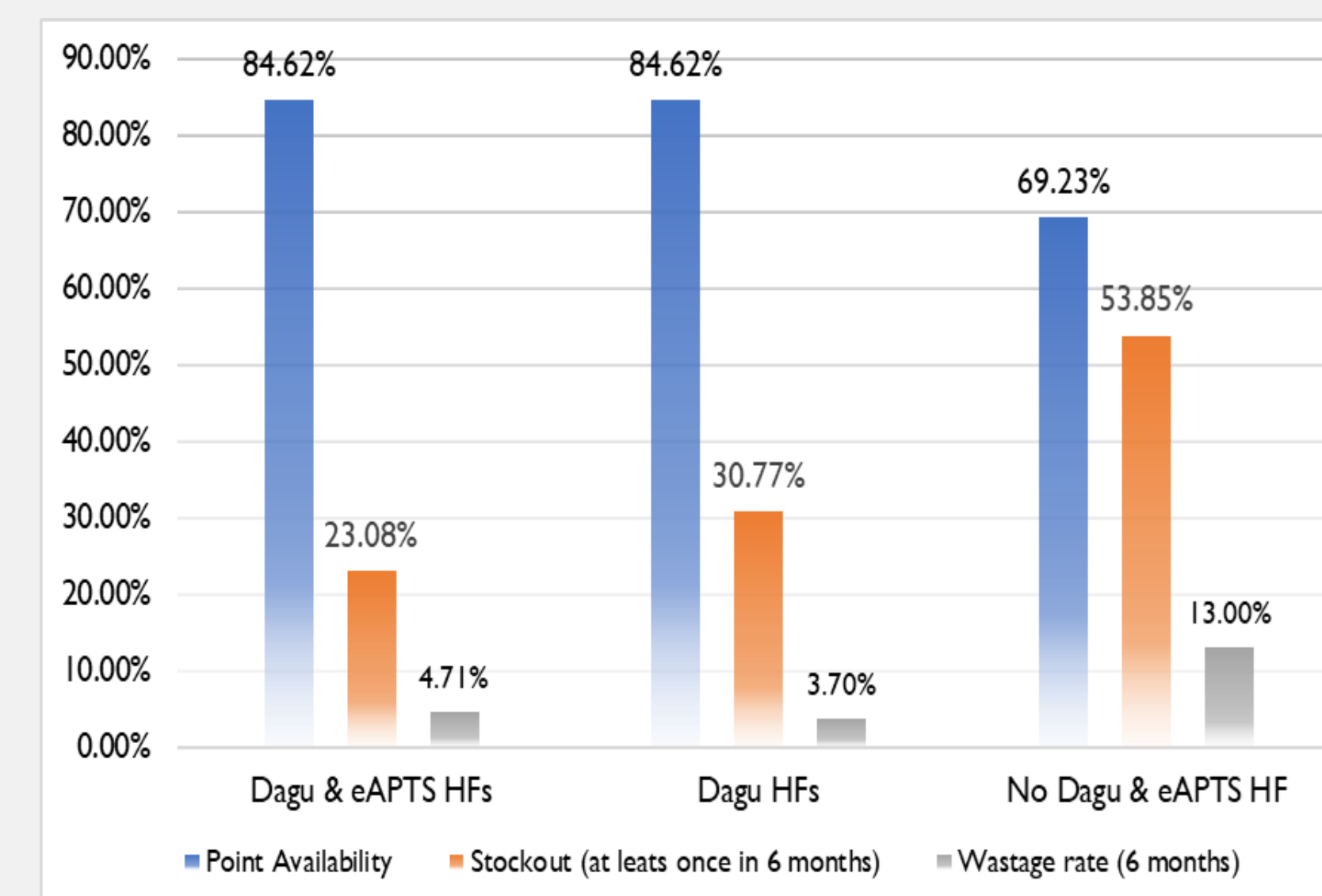


Figure 2: Availability, stockout and wastage rate, Addis Ababa, Ethiopia

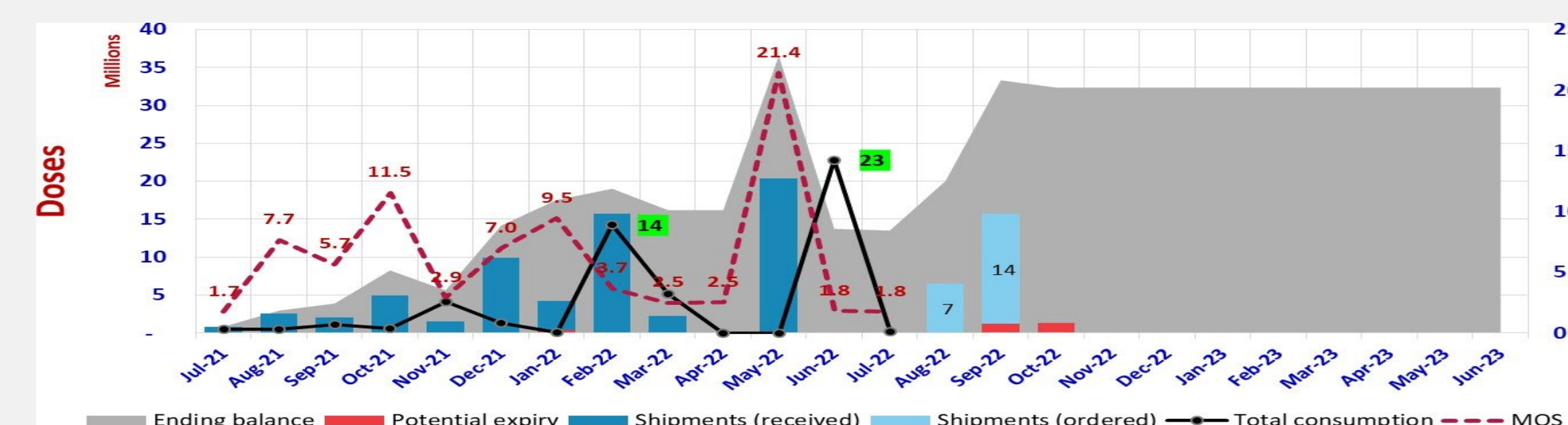


Figure 3: Sample dashboard developed by DHA showing stock status of COVID-19 vaccines



### Facilitators

- Establishment of a technical working group at MOH level, resource allocation, and guidance by the government contributed significantly to the effective implementation of the system.
- Effective communication and collaboration between all stakeholders played a critical role in enhancing the implementation process.
- Involvement of users in the design, development and implementation process ensured eLMIS met their needs and requirements.



### Challenges

- Weak healthcare infrastructure including limited internet connectivity and unreliable power supply challenged the implementation process.
- Poor acceptance and motivation of staff of the system hindered effective implementation and utilization of the tools.
- Lack of readily available maintenance and support to troubleshoot and ensure problems or user issues were quickly resolved also hindered smooth uptake.



### Lessons Learned

- Enhancing the supply chain with digital tools increased accuracy, efficiency and visibility resulting in increased access to needed essential medicines where implemented.
- The implementation of downstream eLMIS tools improved activity processing time, increased last mile stock visibility and availability, reduced wastage rate and helped to save significant amounts of resources that can be used for other priority health problems.
- The implementation of upstream and downstream eLMIS tools streamlined operations from forecast to issue, and allowed proactive inventory control preventing over- and under-stocking.
- Government engagement and capacity strengthening initiatives ensure long-term support and sustainability of interventions.
- Regular monitoring and evaluation of the system helped identify areas for improvement and informed future adjustment.
- Collaboration with development partners help provide technical expertise and financial support for successful implementation of the system.