Building a cold chain maintenance system in Ethiopia

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Abstract

Repair and maintenance of cold chain equipment (CCE) is a huge challenge in many countries. Common issues are:
1. Limited numbers of experienced, well-trained technicians, compounded by turnover;
2. Insufficient funding for travel and spare parts;
3. Data on equipment status and repair needs either failing to reach the right people, or taking too long to do so.

Ethiopia specifically faced similar challenges, including a large backlog of broken CCE (over 5,000 refrigerators out of 21,000 total) and addressed these challenges as follows:
1. A campaign to return the system to normative levels of functionality;
2. Leveraging the campaign to carry out hands-on training for middle- & lower-level technicians on repair and preventative maintenance, for all refrigerator types in the country;
3. Incorporating a new CCE curriculum into a technical college in Addis, to ensure that new graduates are qualified and skilled to work as cold chain technicians.

As a result of this, over 400 technicians have been capacitated and >4,000 refrigerators restored to functionality. In addition, moving ahead the appointment of regional coordinators for maintenance activities, new guidelines and toolkits for all technician levels, will help ensure future technicians are equipped and allocated effectively.

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Phase I: Training and urgent restoration of cold chain to normative levels of functionality

Lack of experienced technicians

Acute need to restore cold storage functionality

1. Lack of experience/confidence of trained technicians in carrying out compression refrigerator repair, and/or preventative maintenance activities
2. High, accumulated levels of non-functional refrigerators choking cold storage capacity

Campaign-style, hands-on training

• Groups of 5 technicians: 1 experienced and 4 but-inexperienced technicians
• Over 6 months, groups travel to 30-40 sites of high non-functionality in 6 zones to affect repairs
• Strong support from FMOH (e.g., travel cost borne by them)

Solution

Experienced technicians and dramatic decrease in non-functional cold storage capacity

1. Over 400 mid-level technicians capacitated for both curative and preventative maintenance
   • On average each technician repaired over 100 refrigerators
   • Technicians can confidently maintain (curative and preventative) compression and absorption refrigerators

2. Dramatic increase in functional storage
   • Repairs restored >100,000 l of needed cold storage capacity

3. Large reduction in non-functional refrigerators in Ethiopia
   • 4,000 (nearly 3/4ths of all repairable refrigerators in Ethiopia) had their functionality restored

Phase II: Building an effective, sustainable system

Problem statement:

Three elements are required to build an effective, sustainable system for repair and maintenance:

- Effective processes
- Sustainable resources and HR
- Clear strategy on preventative maintenance

Effective processes

• Lack of processes that
  • Detect all non-functionality
  • Trigger repairs where needed
  • Coordinate resources to enable repairs
  • Track and drive accountability for repairs

Sustainable resources and HR

• Lack of sustained source of
  • Funding for travel, tools as well as spare parts
  • New, trained technicians to compensate for turnover

Clear strategy on preventative maintenance

• Uncertain cost-effectiveness of system of preventative maintenance to complement curative maintenance

Proposed/in-progress solutions:

Appointing regional coordinators for maintenance to
- Pool resources across different departments to ensure experienced technicians get the data, travel/per diem funding, tools and spare parts to fulfill work orders
- Ensure that funding for travel, spare parts and tools are a line item in sustainable Regional or Federal budgets

Develop a tool and process for scheduling maintenance visits and managing ad hoc repairs, as well as tools to confirm service delivery & quality.
- Enable local coordinator to have oversight into process and course correct when needed.

Incorporate hands-on CCE maintenance as part of technical college and university curriculums to
- Train cohorts of experienced technicians annually to overcome challenge of trained technician turnover

As a first step CHAI has worked with Addis Ababa’s Tegbear-Id Polytechnic to incorporate such a curriculum into their Biomedical technician course

Test a system of scheduled preventative maintenance
- Regional coordinator schedules visits to all woreda stores in 4 zones twice a year for planned preventative maintenance.
- Coordinate with regional health bureaus to fund travel and preventative maintenance interventions where needed.
- Use tracking tool in combination with initial supportive supervision visits to ensure work is carried out well