

## 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.

## Acknowledgements

This work was done in partnership with the Ministry of Health – Ethiopia and with support from The Canadian Department of Foreign Affairs, Trade and Development



Canada



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

Challenge

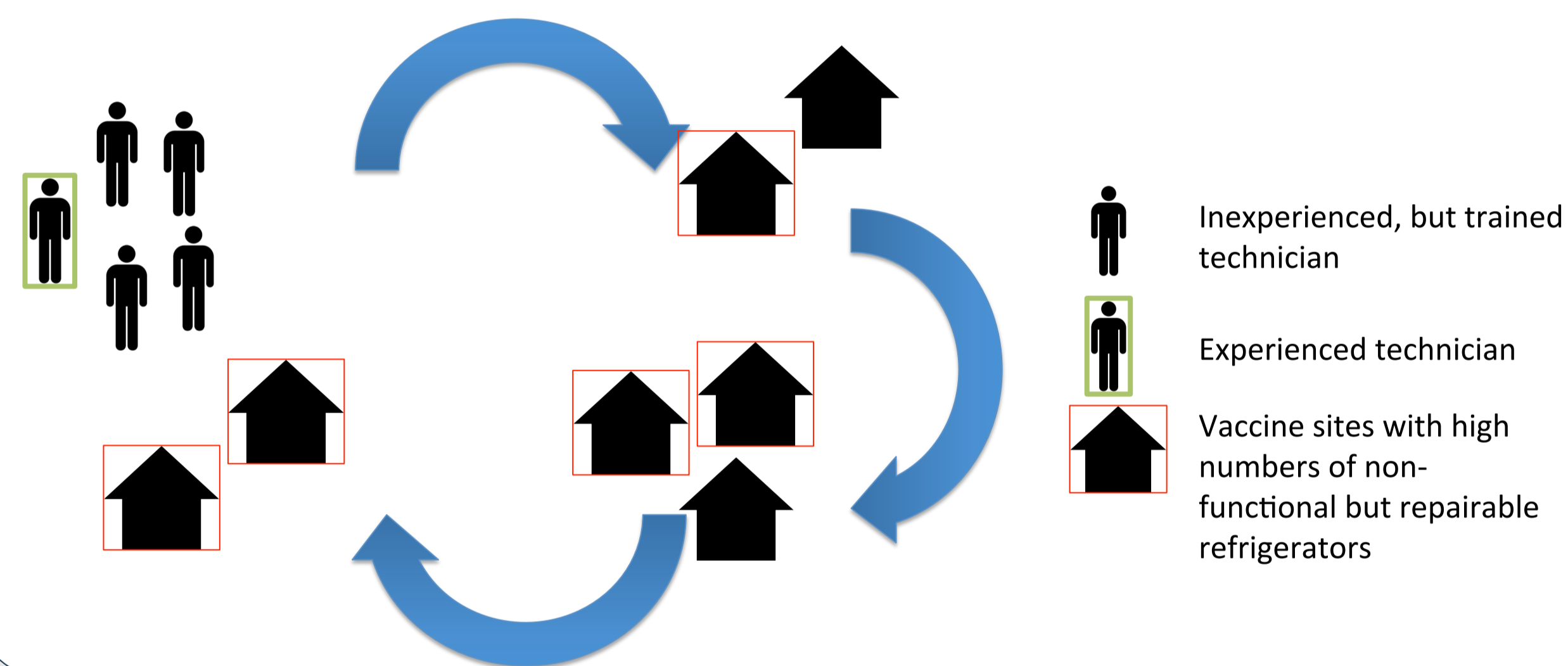
### Lack of experienced technicians Acute need to restore cold storage functionality

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

Solution

### Campaign-style, hands-on training

- **Groups of 5 technicians:** 1 experienced and 4 trained-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)

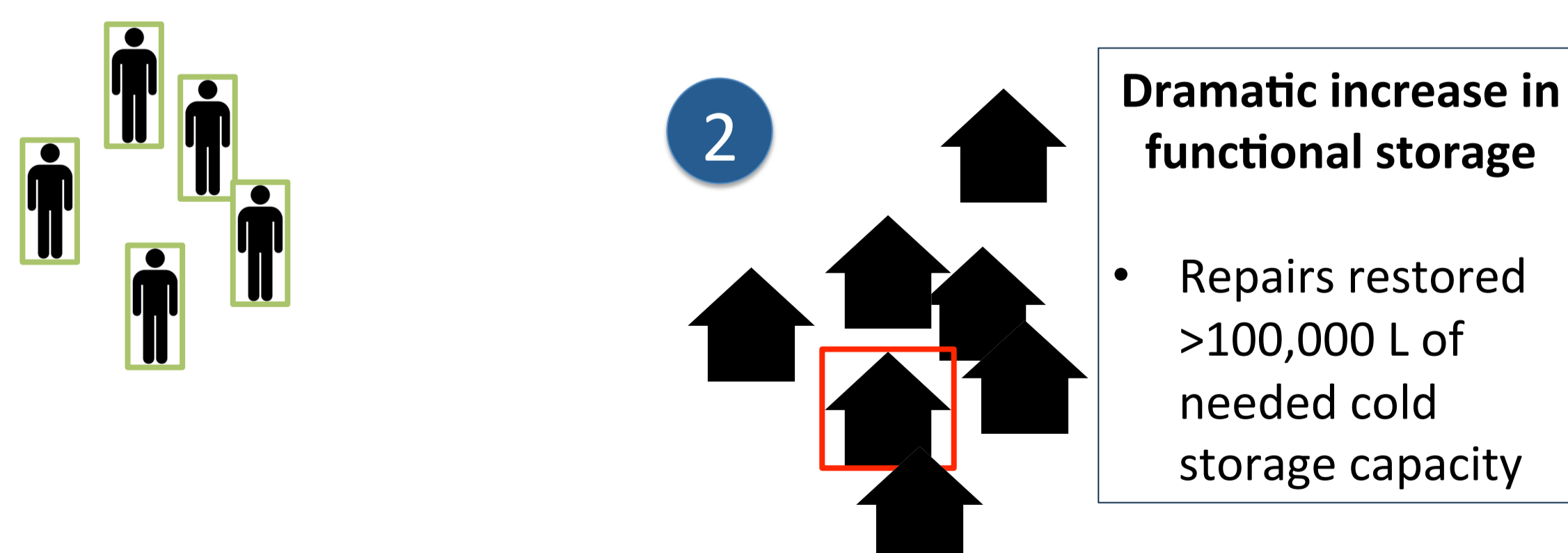


Outcome

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

#### 1 Over 400 mid-level technicians capacitated for both curative and preventative maintenance

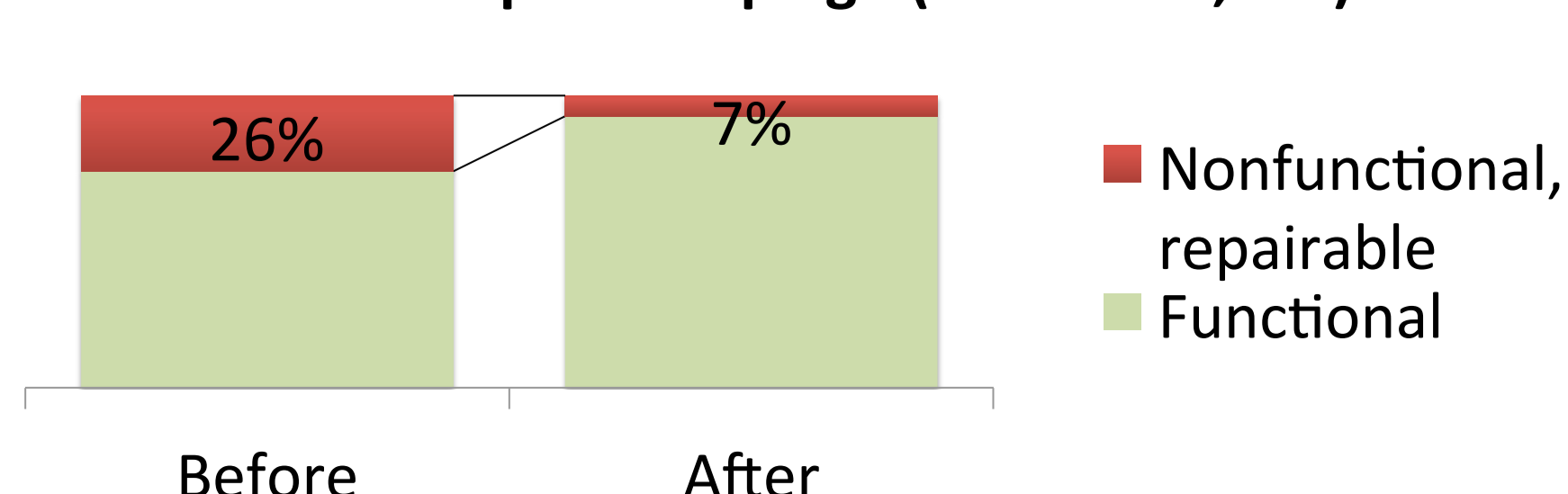
- On average each technician repaired over 100 refrigerators
- Technicians can confidently maintain (curative and preventative) compression and absorption refrigerators



#### 3 Large reduction in non-functional refrigerators in Ethiopia

- 4,000 (nearly 3/4ths of all repairable refrigerators in Ethiopia) had their functionality restored

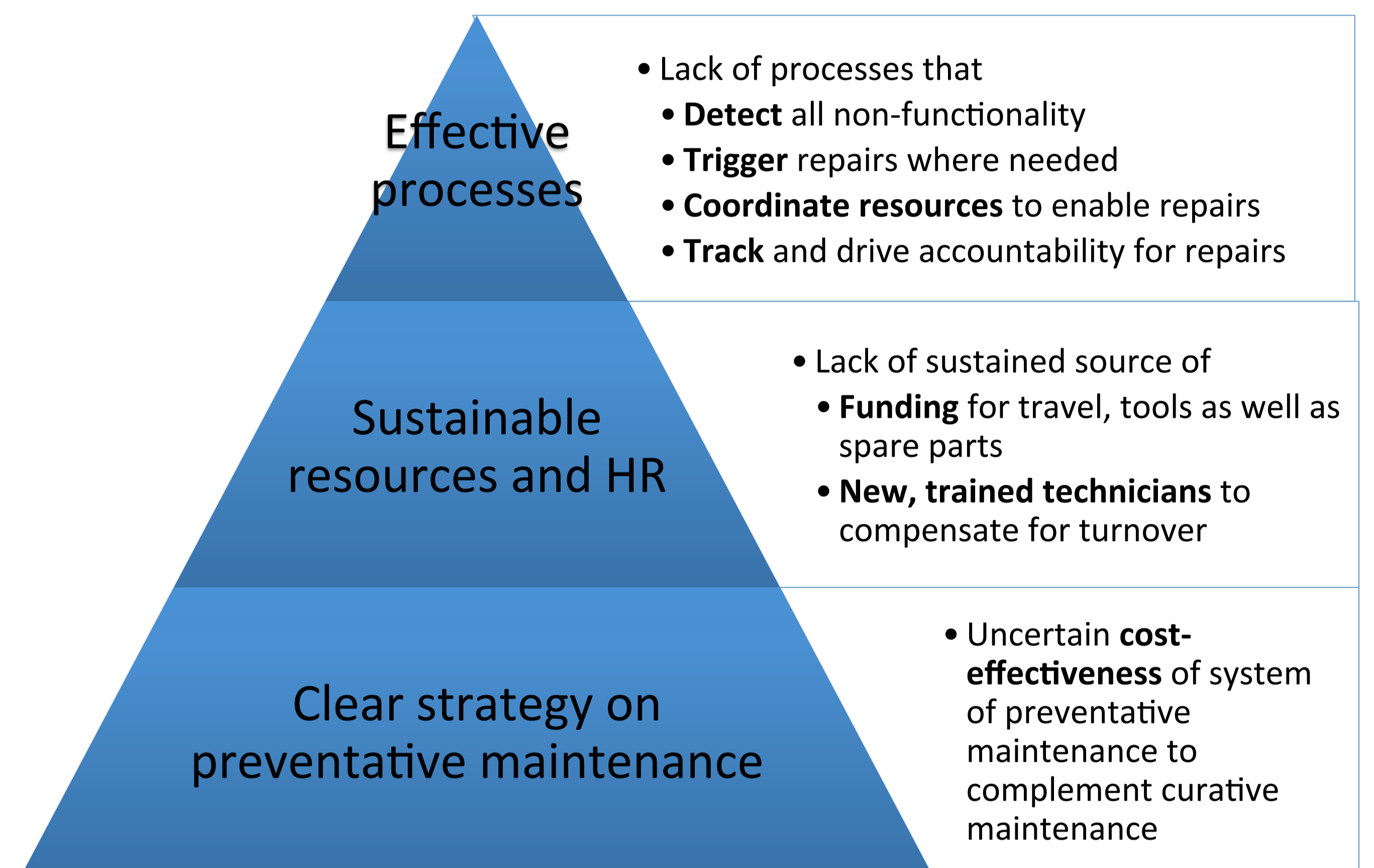
% of refrigerators non-functional before and after repair campaign (100% = 21,000)



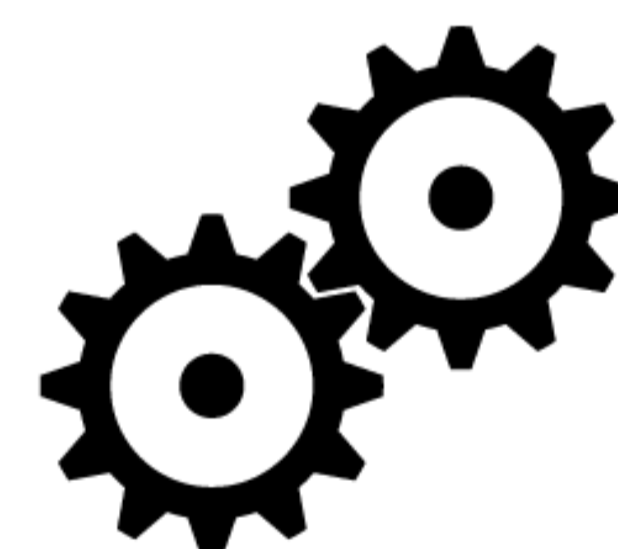
## Phase II: Building an effective, sustainable system

### Problem statement:

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



### Proposed/In-progress solutions:



Coordinate Parts & Staff

- 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**



Track Performance

- 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.



Cultivate Sources of Trained HR

- 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 Tegbare-id Polytechnic to incorporate such a curriculum into their Biomedical technician course*



Test Preventative Maintenance

- 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**