



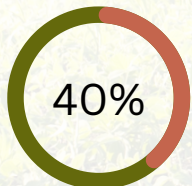
Post-harvest losses contribute to approximately 40% of food loss and waste in Egypt, leading to dire financial, economic, and environmental losses. This is partially due to the absence of an effective and sustainable post-harvest-to-consumer cold value chain in Egypt. Improving access to the cold value chain is a priority for Egypt's food security and food systems sustainability. It can contribute effectively to diminishing post-harvest losses and hence decrease waste, help meet Egypt's food gap and preserve scarce water and energy resources used in food production. An improved cold value chain would also mean increased income for farmers due to decreased losses and maximization of crop value. Finally, without effective cold chain, the export potential cannot be maximized. With this in mind, the Embassy of the Netherlands, Chemomics Egypt Consultants, and Wageningen University, partnered to develop an investment map of cold value chain opportunities in Egypt.

The study will be published in January 2023. Highlights of the study are presented in this flyer. The study mapped 29 investment opportunities in the cold value chain and short listed them through a multi-indicators criterion leading to the a list of most promising opportunities in each part of the value chain. In addition, the study defines most sustainable sustainability measures (integration of renewable efficiency and energy efficiency) to be integrated with cooling technologies and created various maps and guidelines linking technology classes to crop types. The study when published will provide visibility and awareness of most promising and needed cold chain investment opportunities in Egypt, with the hope to become the trigger for future activities to open up investments in cold value chain technologies and services.

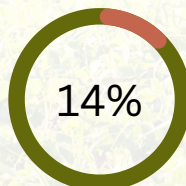
Quick Facts:



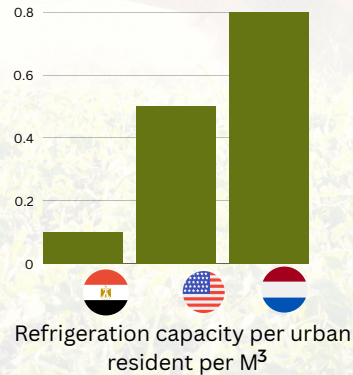
30 % of Egyptians work in agriculture



Post harvest losses



Of Egyptian GDP growth

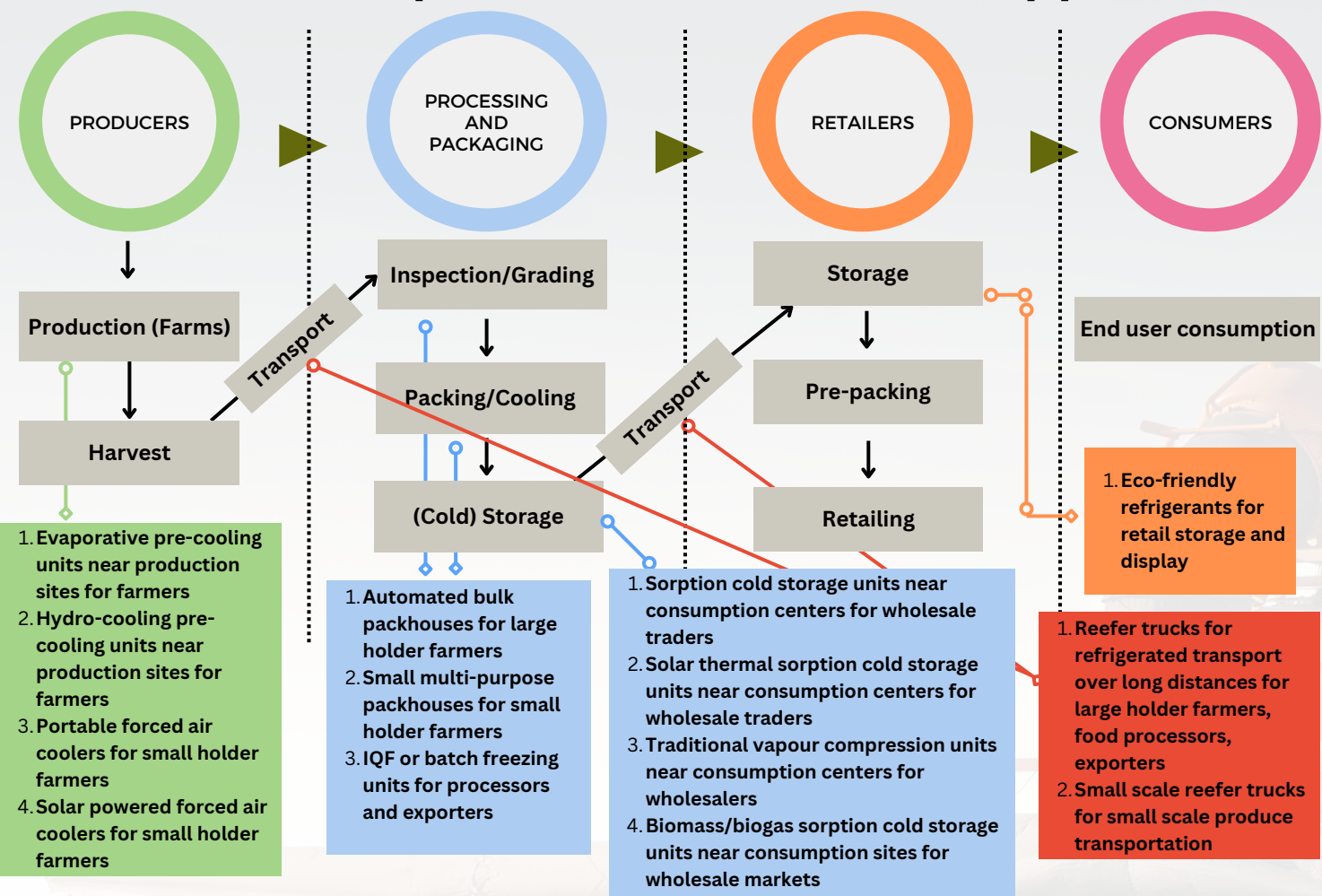


- Tomatoes
USD 638 Million
7.7 Million Tons
- Potatoes
USD 900 Million
9.7 Million Tons
- Mangos
USD 537 Million
1.2 Million Tons
- Oranges
USD 355 Million
2.9 Million Tons



- Onions
USD 19 Million
35 Thousand Tons
- Sweet Potatoes
USD 15 Million
11 Thousand Tons
- Grapes
USD 61 Million
26 Thousand Tons
- Oranges
USD 50 Million
52 Thousand Tons

Value chain components and Business Opportunities



<i>Technology overview</i>	Hydro-Cooling	Sorption cooling	Vapour compression	Forced air cooling	Evaporative cooling
Typical cooling time (h)	0.1 - 1.0	20-100	20-100	1-10	5 - 10
Produce moisture loss (% range)	0 - 0.5	0.1 - 2.0	0.1 - 2.0	0.1 - 2.0	0
Water contact with produce	Yes	No	No	No	No
Energy efficiency	High	Medium ; High if powered by RE	Low	Low	Medium
Capex	Low	High	Low	Low	Low
Examples of relevant crops	Green onions, Green beans, lettuce	Bananas, Citrus, Mango and "High value produce"	Applicable to all fruits and vegetables and "High value produce"	Applicable to all fruits and vegetables	Tomatoes, Mangoes, Bananas, Green pepper and leafy vegetables

Energy Efficiency and Renewable Energy investment Opportunities in Cooling Chain

1. Online monitoring of produce
2. Data logging systems
3. Smart packaging stickers
4. Variable speed drive refrigeration motors
5. Insulation sandwich panels
6. Radio Frequency Identification (RFID)
7. Smart control and management systems
8. Solar PV energy as an energy source
9. Solar thermal energy as an energy source
10. Biomass energy as an energy source
11. Biogas energy as an energy source