

# **USDA's Cold Chain Capacity Building**

**Clemen Gehlhar, Ph.D.**

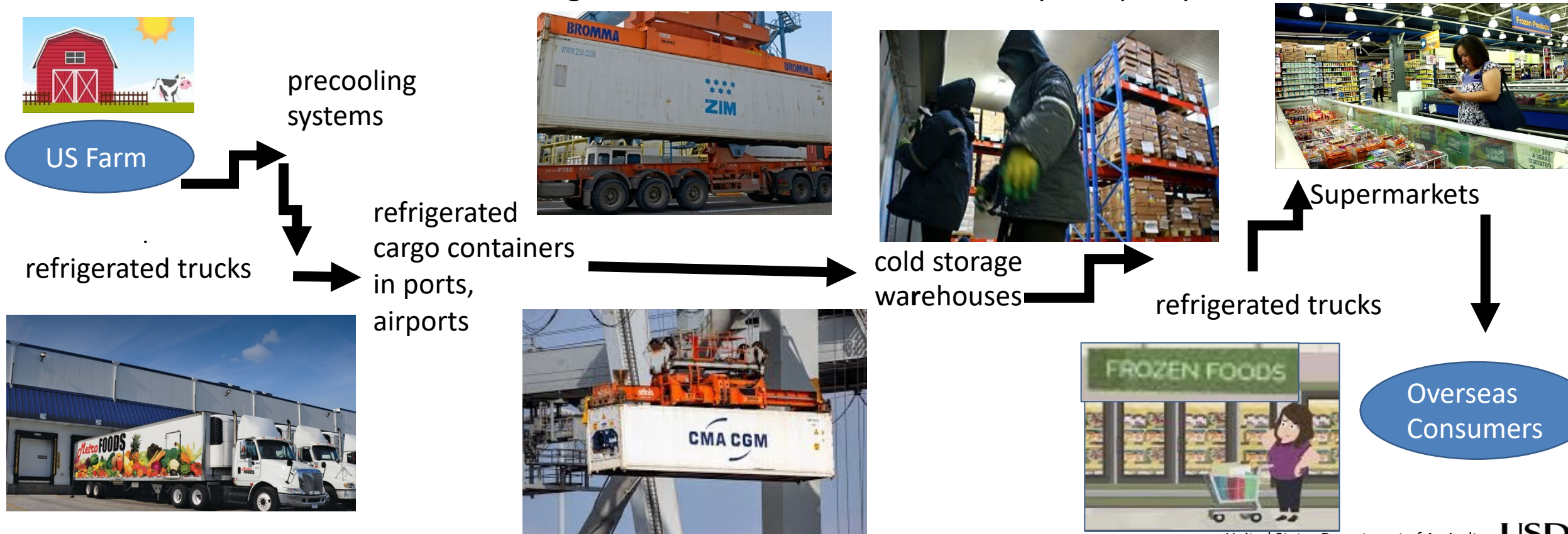
**Foreign Agricultural Service/Global Programs/Agricultural Economic  
Development (FAS/GP/AED) Division**

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# What is Cold Chain?

- **Temperature management of perishable products** from the point of slaughter or harvest, through the **distribution chain** to the final consumer, **to prevent loss, maintain quality and safety**
- Cold chain **infrastructure** includes **regulations and standards** for food safety and quality.



# Why is it Important?

## ❑ **Weakness in cold chain infrastructure impedes U.S. agricultural exports in emerging and potential growth markets**

- These markets have Increasing middle class income, and demand for high-value consumer foods, **BUT**
- Insufficient/inadequate refrigeration systems and distribution linkages---
- Severely limit potential U.S. sales by importers, distributors, wholesalers and retailers of U.S. agricultural products.

## ❑ **FAS is well positioned to invest in cold chain technical assistance and capacity building in growth markets such as Africa and Southeast Asia**

- Can leverage its investment through collaboration with USTDA (Trade and Development Agency) on possible feasibility studies and technical assistance in Ghana and other countries.

# Food Quality and Food Safety through Cold Chain

## Consumer Requirements

- Consistency of quality
- Consistency of supply
- Safe – Free of contamination
- Price premium on higher quality

## Causes and Sites of Loss

### Mechanical

- Improper **handling**
- **Poor packing**
- **Improper** storage
- Temperature abuse
- Duration of storage

### Disease & Insects



## Postharvest Losses

Loss of Quantity (10 to 30%)

## Temperature maintenance most important component to add value

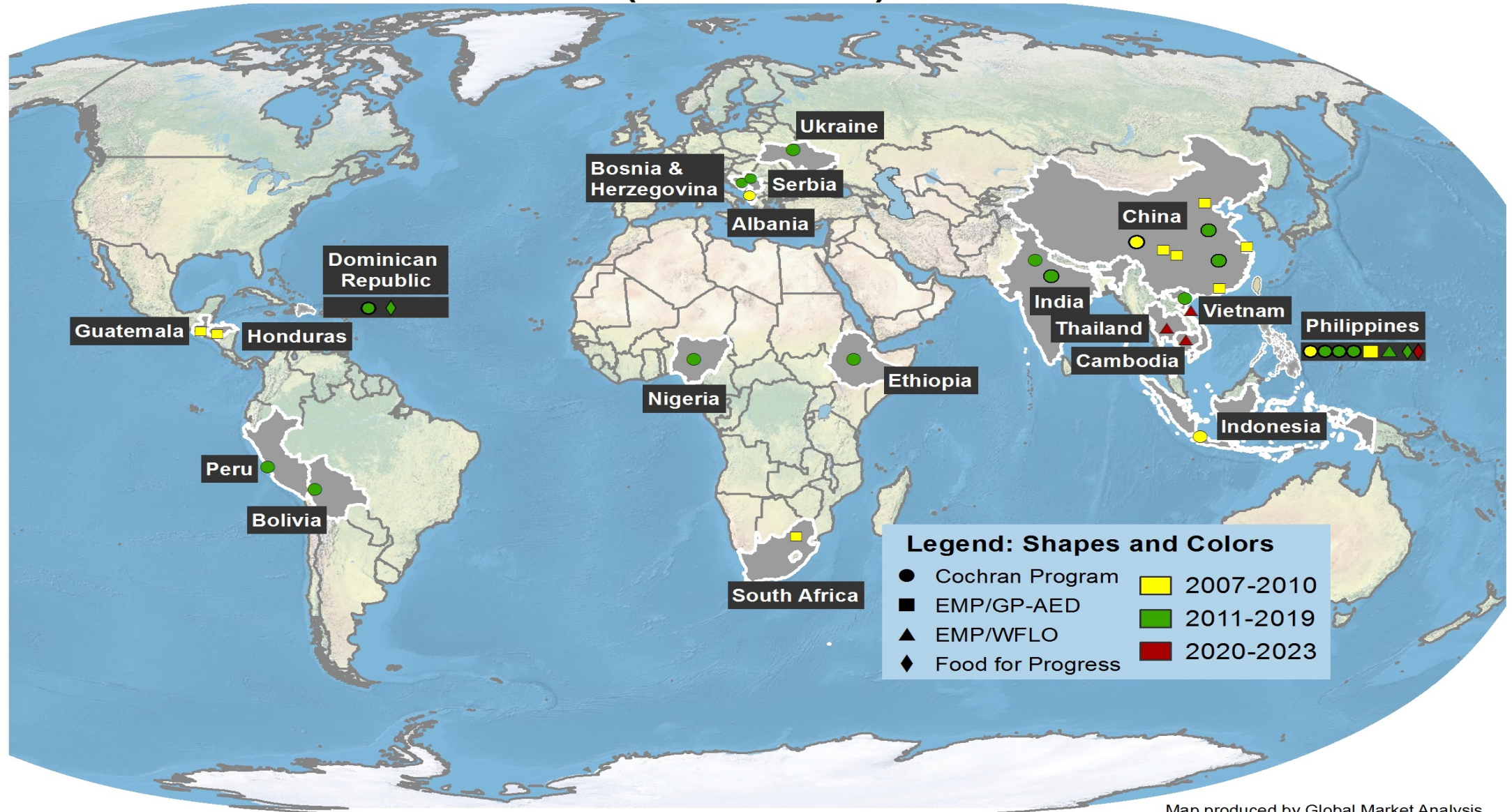
Slows down loss of quality and disease development

- Most crops store near 0 °C, not frozen
- For tropical commodities, injury occurs below 10 °C

Time/Temperature - Storage duration



# FAS Cold Chain Technical Assistance (2007 - 2023)



# FAS Global Cold Chain Improvement Initiative 1998-2010

**Why learn about it?** Framework for technical assistance is relevant to potential work in current FAS Priority countries/regions. **With interagency partners, FAS can help develop deals that not only bring benefits to U.S. farmers and food exporters, but potentially to U.S. manufacturers and suppliers of cold chain infrastructure.**

The FAS GCCII was a long-term program aimed at improving the infrastructure and technology for handling **high value perishable foods**, to **enhance food safety, improve food quality** and increase **economic efficiency and profits to participating companies**. Infrastructure support also includes improved **cold chain standards and regulations**.

- Program launched in 1998 and developed, in collaboration with Global Cold Chain Alliance(GCCA)/World Food Logistics Organization(WFLO)-- Steve Beasley, FAS and Bill Hudson, GCCA/WFLO
- Demand Driven from FAS Posts (Foreign Service Officers in US Embassies)
- Public- Private partnerships: USG (USDA AMS and ARS, Commerce FCS, FDA) and US Industry (FAS cooperators, GCCA members and other industry) in partnership with counterparts in emerging markets
- Funded primarily by USDA/FAS Emerging Market Program(EMP), leveraged with USAID funds

# GCCI Technical Assistance Framework

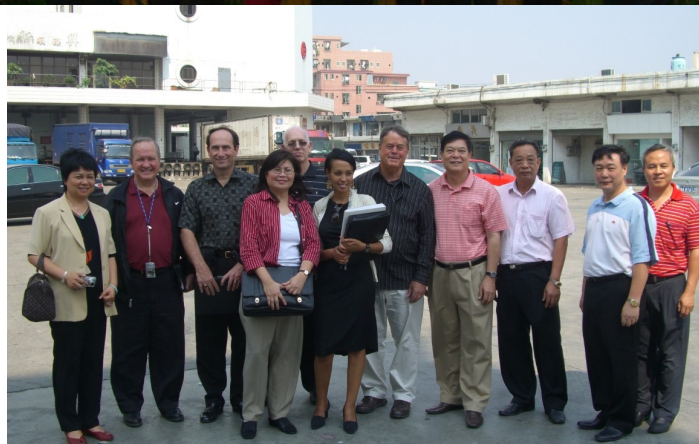
Phase I	Phase II	Phase III
<b>Cold chain seminar/conference (1-2 Day program)</b>	<b>Two week audit of companies (6-8 months after Phase I)</b>	<b>Evaluation and conference (6-12 months after Phase II)</b>
Builds industry awareness  Includes technical experts on cold storage facilities, warehouses, logistics	Gives specific direction to strategic firms  Improves overall market capacity	Evaluates company advances  Builds cold-chain synergies and associations



# 2007: Guangzhou



Phase I, II and III visit by U.S. technical experts, FAS/W and Post in facilities design, cold storage and warehouse management, transportation logistics, food processing and safety, retail merchandizing



# 2008: Chongqing

**Cold Chain Seminar and Mini-Trade show**, close collaboration between **FAS/W, FAS Posts in China (Beijing and Guangzhou), and FCS Chengdu.**

## **Seminar Speakers:**

- U.S. companies
  - *Ingersoll Rand* (integrated value chains in commercial agriculture)
  - *P.E.B. Commodities* (handling, packing, storing and transporting perishables)
- Chinese institution representatives:
  - *Chongqing Lianglu Cuntan Free Trade Port Area* (CQFTPA) on plans to develop marine port section and airport logistics hub
  - *Secretary-General of the China Logistics Technology Association* on challenges faced by China cold chain logistics development

**Mini-Trade Show:** *Carrier, Ritehite, Sensitech Inc., Heatcraft, Havi Logistics and Avante International Technology Inc.* presented company profiles and showcased products



# 2009: Roundtable Workshops on Cold Chain Guidelines, Standards and Regulations

**Guatemala :** Regional conference and break out sessions to develop action plans



**South Africa:** Regional conference

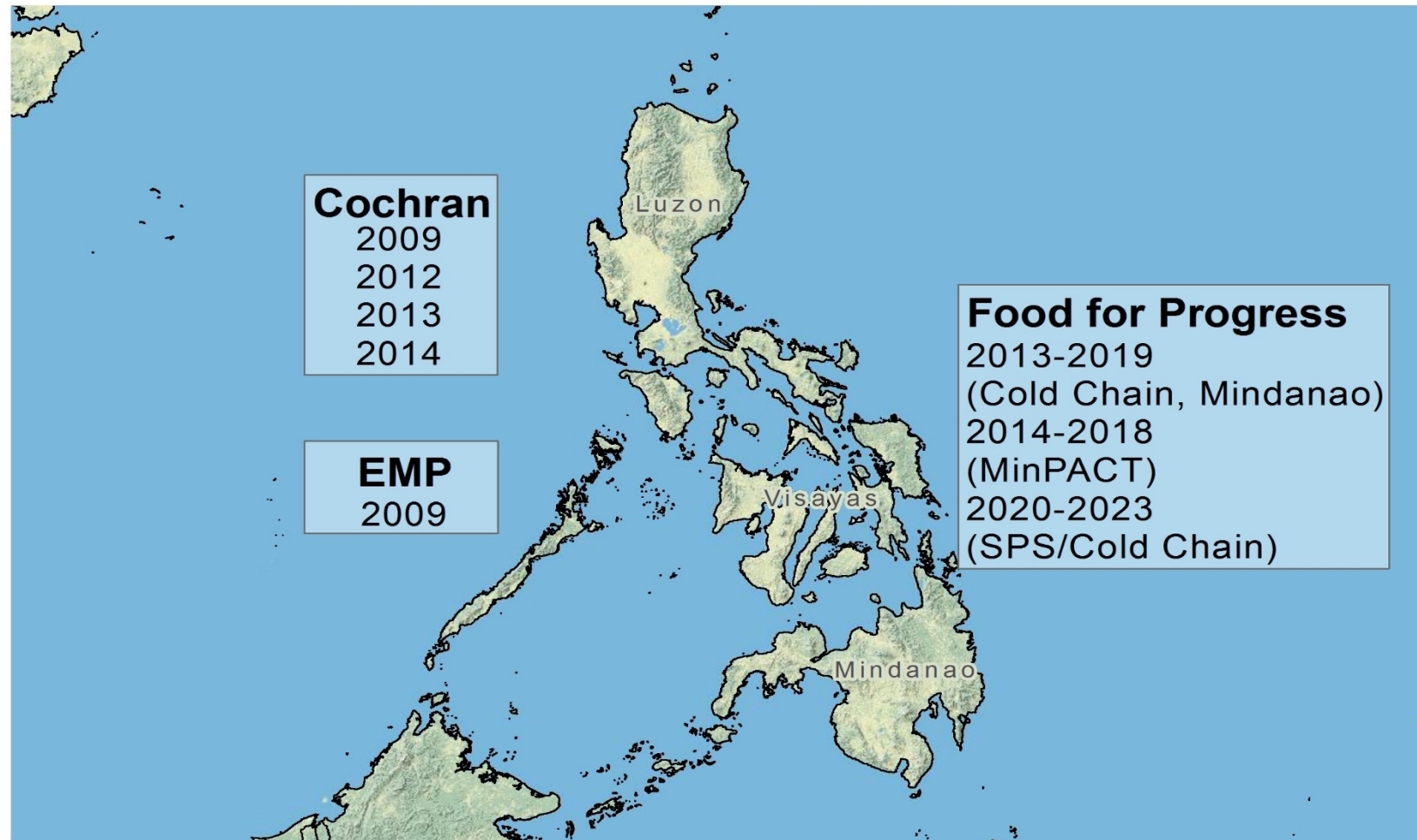




# FAS/EMP and other Programs in the Philippines



## FAS Cold Chain Technical Assistance



USDA United States Department of Agriculture  
Foreign Agricultural Service

Source: FAS Agricultural Economic Development Division of  
Global Programs and ESRI spatial reference data

# Food Quality training: Grades and Standards in Serbia

- Cold chain management ensures **high quality** of perishable agricultural products are maintained as they move through the distribution process
- “**Higher quality means high prices**” is determined by a **common language** for producers, processors, traders and consumers --- through a national functioning system and harmonized with international **grades and standards**
- In 2013-14, USDA conducted training for Serbian representatives from government and industry in designing and implementing grades and standards system for fruits and vegetables, and meat products



**Agricultural Marketing Service**  
Fruit and Vegetable Programs

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## **USDA's AMS Fruit and Vegetable Programs:**

- Develop U.S. Grade Standards
- Grade and inspect product
- Collect and disseminate Market News reports and information
- Enforce Perishable Agricultural Commodities Act (PACA)
- Partner with state and industry to help overcome marketing barriers
- Provide Audit Verification Services



[www.ams.usda.gov/fv](http://www.ams.usda.gov/fv)





Uniformity standards harmonized with international standards:

UNECE STANDARD FFV-57





# General Inspection Procedures (example)

- Sampling

- For a full load, the general rule is to double the size of the master, 24 samples for a full load of cranberries
- Obtain 1 container from each master



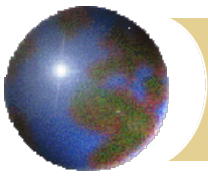
# Serbia Food Quality training in Grades and Standards for Meat

Lectures from USDA technical experts



Demonstration of different qualities of pork cuts by USDA technical experts





# Results and Impacts:

**Trained 4,500 participants in over 20 countries**

**Audited about 120 companies**

## **Mexico**

- Company reports record yearly profit by adding over \$2 million in sales
- Critical modifications including: redesigned facilities, increased capacity, and additional transportation efficiencies

## **Brazil**

- Fruit and juice sales grew 400% to \$5 million
- Developed better cargo inspection practices for produce and other perishable products

## **Common Improvements:**

- Temperature tracking
- Moisture Control
- Transportation (e.g. refrigerated trucks)
- Docks
- Handling and separation of products

## **National Cold Chain Associations as of 2020:**

- **Philippines, established in 2003**
- South Africa
- Indonesia
- Nigeria

# Questions?

# Speaker's Bio



Clemen Gehlhar managed the FAS Global Cold Chain Improvement Initiative from 2007-2010. She is now working on securing FAS funding for cold chain technical assistance in South East Asia, Africa and Latin America, to leverage with cold chain programs from USTDA, USAID, MCC and other donors. Clemen is an agricultural economist by training, with a Bachelor's degree from the University of the Philippines in Los Banos, a Masters' from the University of New England in Australia, and a Ph.D. from the University of Kentucky, major in International Trade and Development. Prior to USDA, she worked in the International Rice Research Institute (IRRI) in the Philippines, and the International Food Policy Research Institute in Washington, D.C.

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