Postharvest Horticulture Education, Research & Extension

Developing country experience

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AVRDC-The World Vegetable Center

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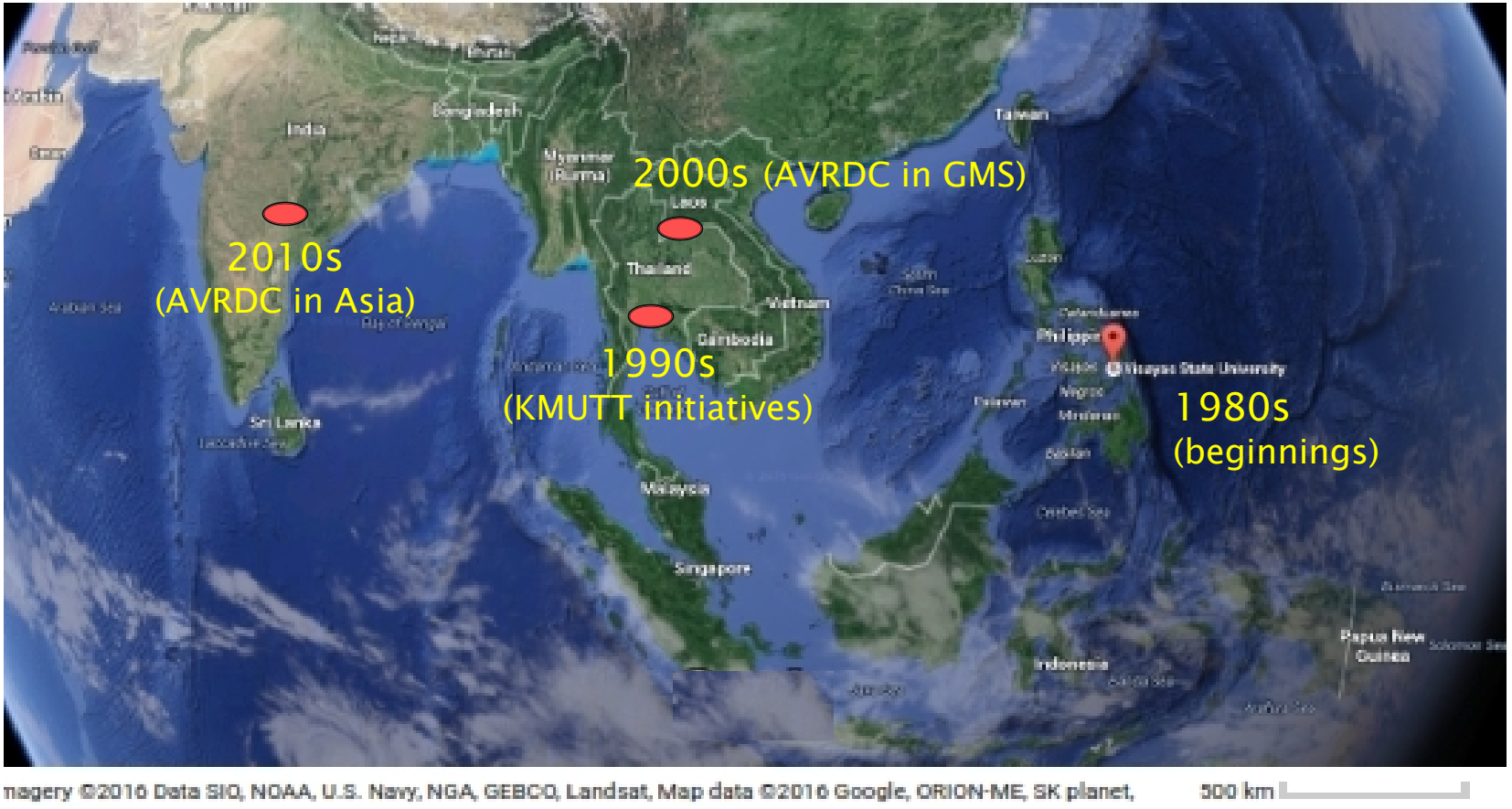
The World Vegetable Center

Overview


India
Bangladesh
Myanmar (Burma)
Laos
Thailand
Vietnam
Cambodia
Sri Lanka
Malaysia
Singapore
Indonesia
Taiwan
Philippines
Visayas State University
Papua New Guinea
2000s (AVRDC in GMS)
2010s
(AVRDC in Asia)
1990s
(KMUTT initiatives)
1980s
(beginnings)
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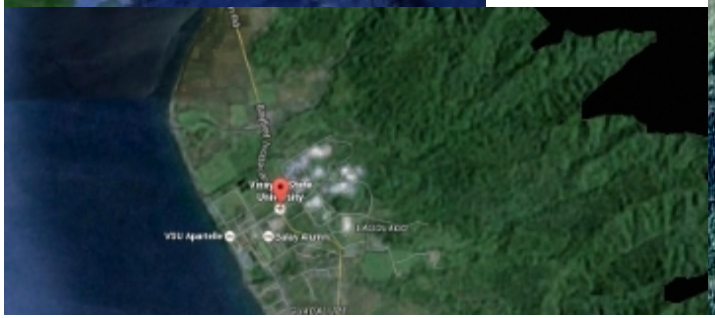
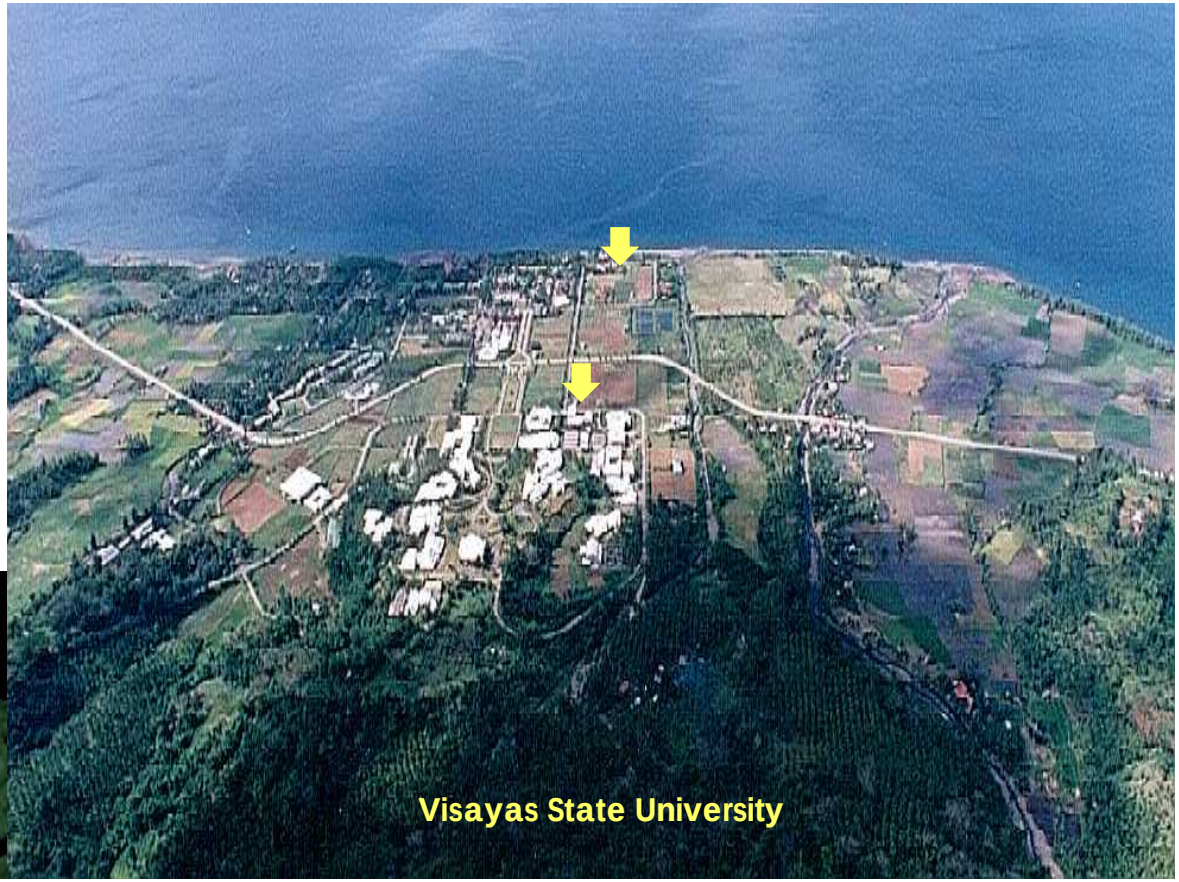
500 km

Beginnings

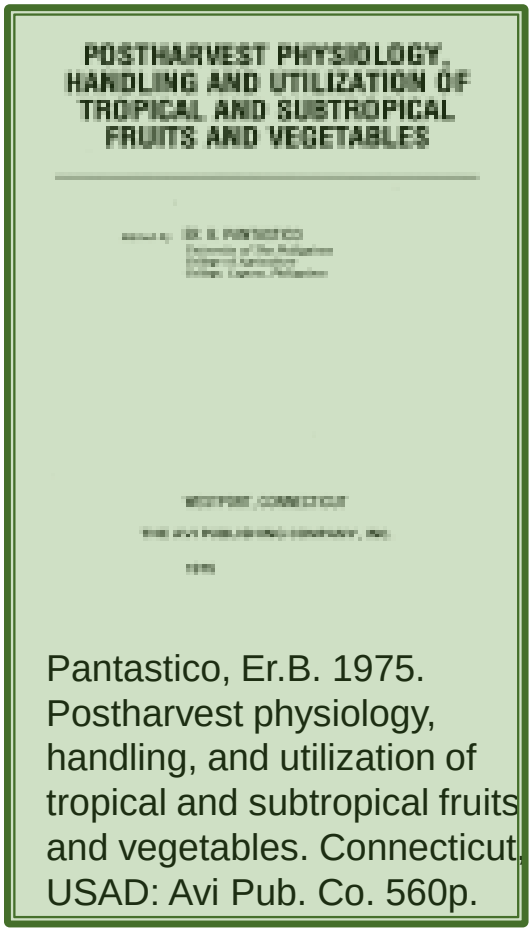

Manila
Philippines
Visayas State University




Visayas State University

Beginnings

- Since the beginning, postharvest horticulture education, research & extension (PHERE) go together.
- The beginning was almost nothing, except the book of Pantastico, 1975.
- Postharvest trainings and advanced education (MS, PhD) shaped the PHERE landscape at the univ.
- Research and collaboration were the critical elements.
- Donor-funded research (IFS, IDRC, JSPS, ACIAR) made the Postharvest Technology Labs.



Pantastico, Er.B. 1975. Postharvest physiology, handling, and utilization of tropical and subtropical fruits and vegetables. Connecticut, USAD: Avi Pub. Co. 560p.

Beginnings

- We need to research to produce usable knowledge and correctly educate next generations, farmers and industries.
- We need to collaborate as PHERE involves other disciplines (chemistry, engineering, pathology, economics, etc) and to develop solid evidence, reputable outputs and increased competitiveness.

Beginnings

University education

- BS Agriculture major in Horticulture – mid 80s

  –one postharvest subject; other postharvest topics in crop-related subjects; thesis research required

- MS Hort major in Postharvest Physiology – late 80s
- PhD Hort major in Postharvest Physiology – early 90s

  –coursework and thesis (MS & PhD); coursework on advanced subjects in postharvest physiology, biochemistry, pathology, refrigeration engineering; additional subjects for PhD students only

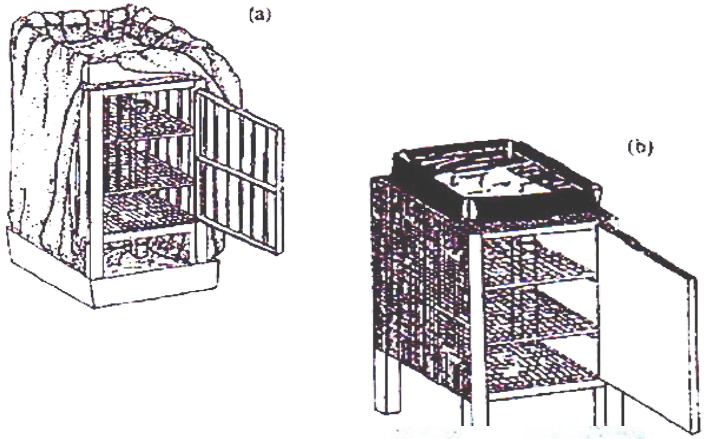
Beginnings

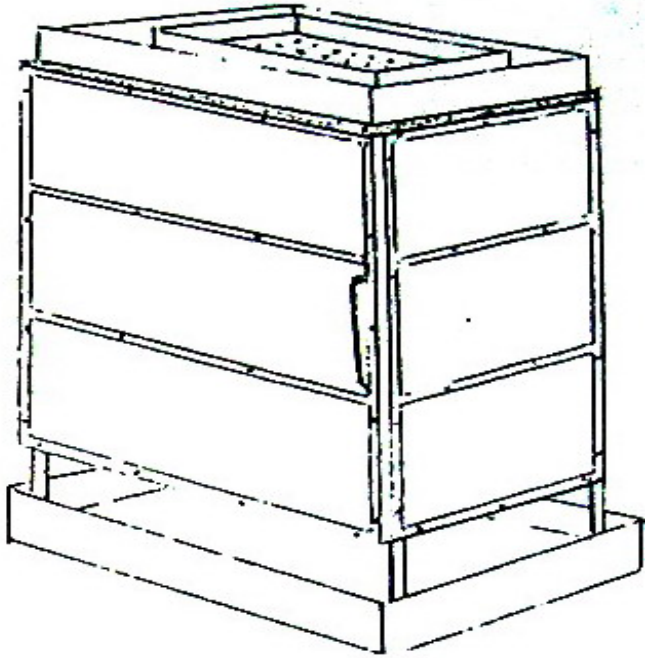
University research

- Postharvest Technology Lab – mid 80s
  - –only weighing scale, a refractometer and a space for expts
  - –we improvised and economized for temperature, RH, titration and other measurements
  - –we extensively used rating scales with color charts/pictures
- Researches conducted – applied, hit-and-miss, simple & cheap
  - –Evaporative coolers (surprisingly kept tomatoes for 3-4 wks)
  - –Modified atmosphere packaging (MAP) using commercial plastic bags
- Better research facilities in early 90s and beyond
  - –research grants (IFS, IDRC, ACIAR, govt, etc.)
  - –strengthened approach: loss assessment, R&D to develop technologies which still focused on simple and cheap techniques (e.g. heat treatment, botanicals as antimicrobials)

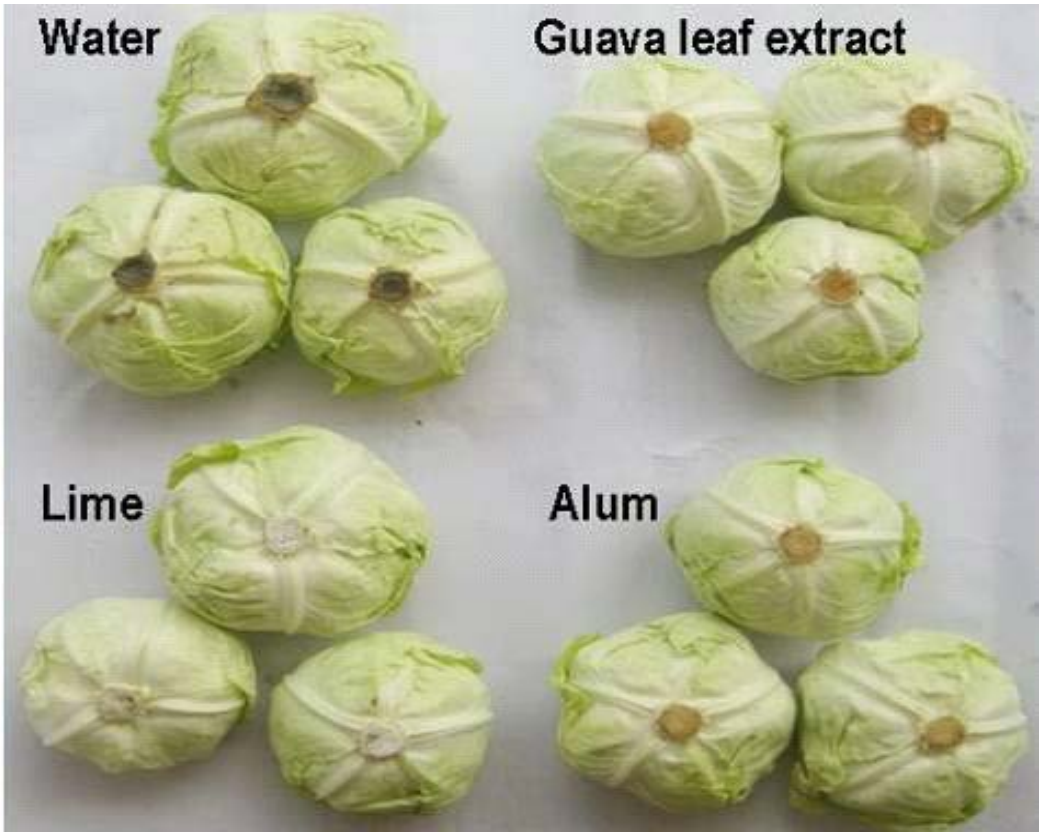
Beginnings

Evaporative coolers





Beginnings

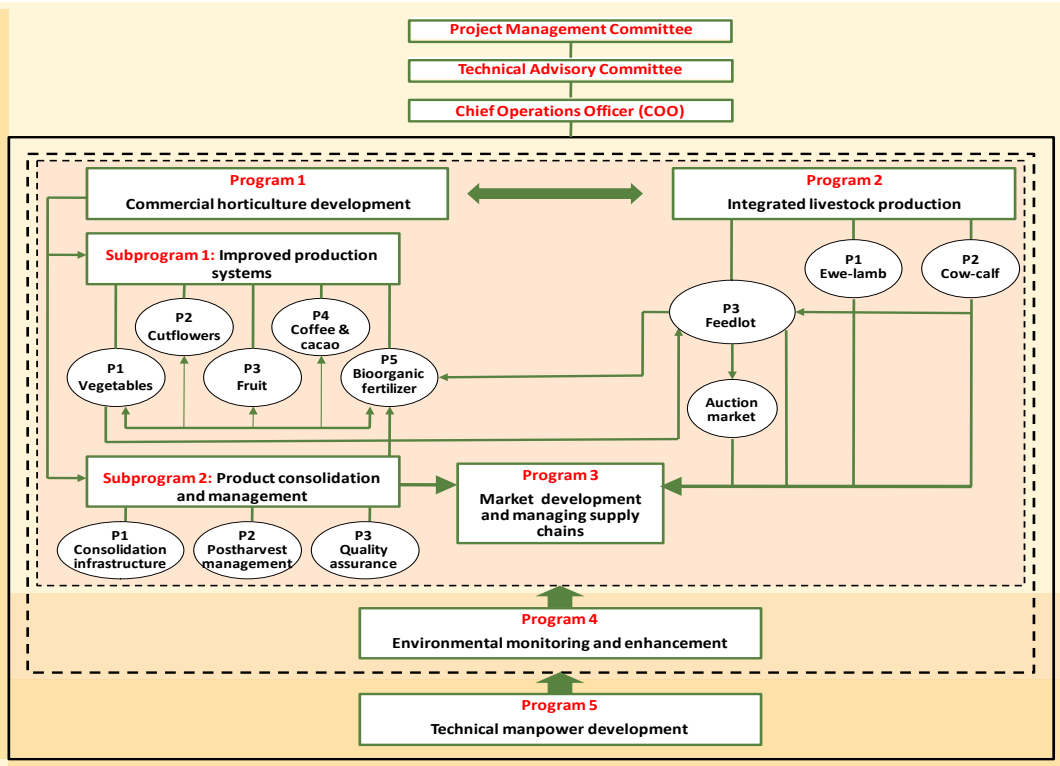


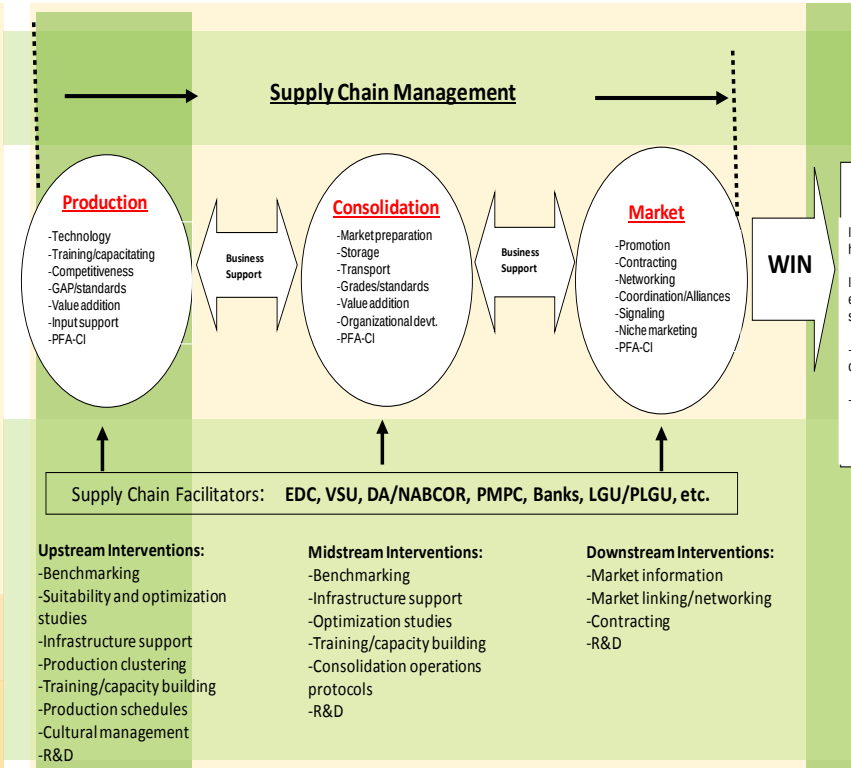
Controlling cabbage soft rot with guava leaf extract, alum or lime

Beginnings

University extension

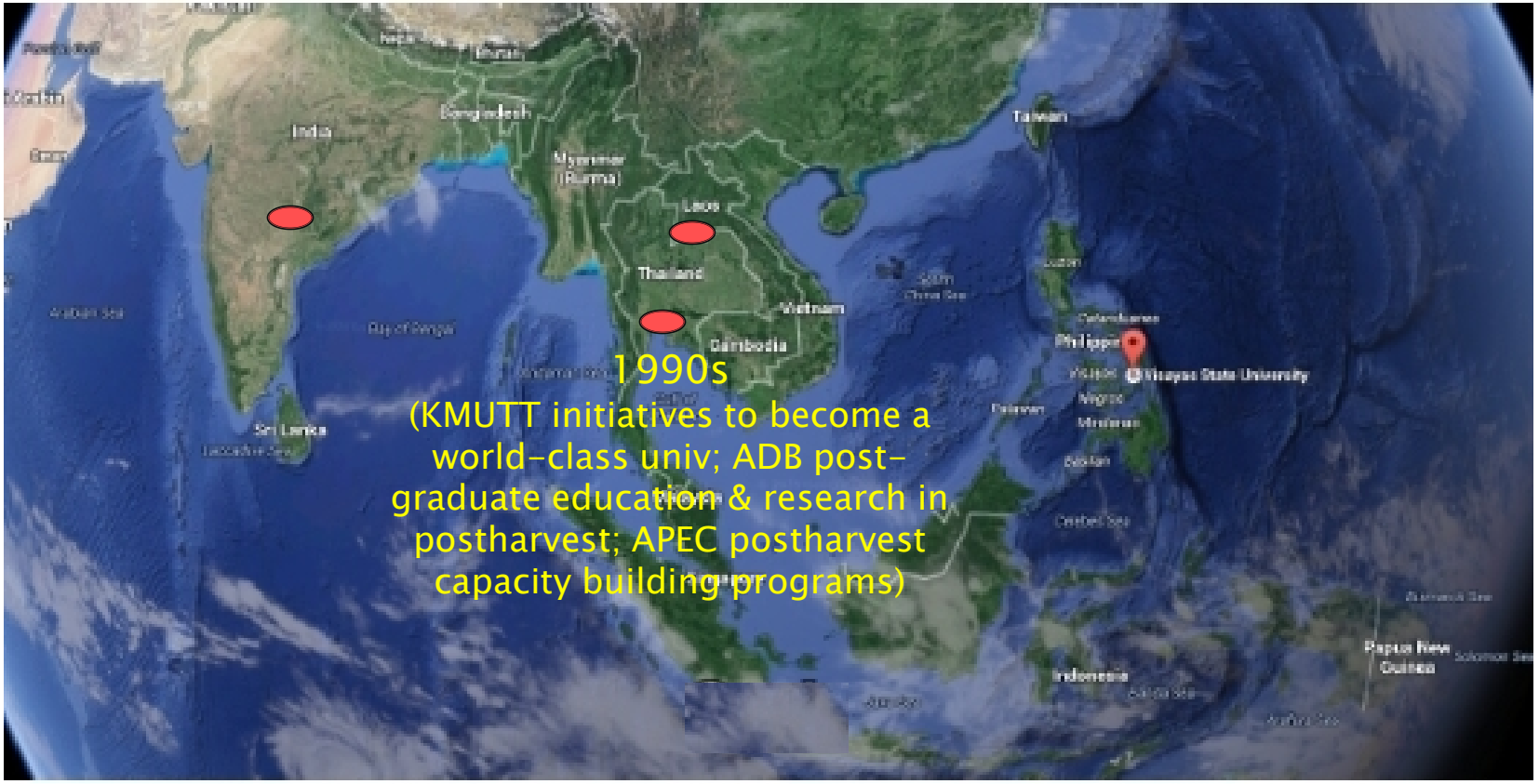
- Resource person in trainings to organizing trainings and undertaking multidisciplinary programs





PMPC-EDC-DA-NABCOR-VSU Integrated and Diversified Program for Development of the Ormoc-Kananga Upland Range

Thailand & APEC works



Thailand & APEC works

- *APEC Institutional Linkage Program in Human Resource Development in Postharvest Technology (mid 90s)*
- *ADB Post-Graduate Education and Research in Postharvest Technology (early 2000s)*

  -yearly engagement since 1997

  -Activities supported KMUTT's drive to become world-class univ (also other Thai univ)

  -international training programs

  -international workshop to develop PhD program and research; graduate thesis advising and strengthening

  -internationalizing the graduate programs (first batch from Cambodia, Indonesia and Philippines)

  -international scientific conferences yearly since 2003

AVRDC in GMS


2000s (AVRDC in GMS)
-2 ADB supply chain projects
-FAO collaboration
-othercollaboration
India
Bangladesh
Myanmar (Burma)
Laos
Thailand
Vietnam
Cambodia
Philippines
Visayas State University
Sri Lanka
Malaysia
Singapore
Indonesia
Papua New Guinea
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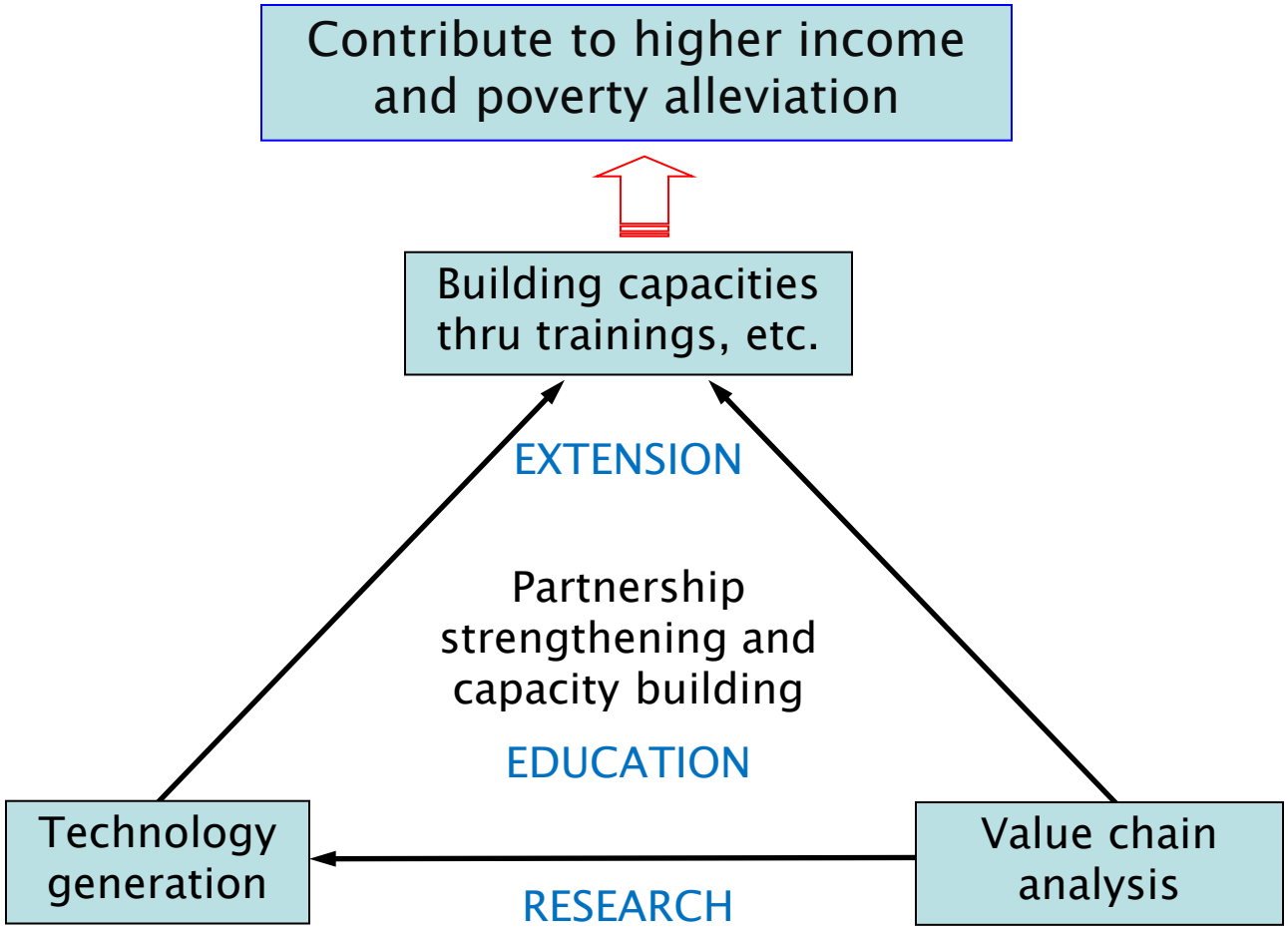
500 km

AVRDC in GMS



Supply chain approach

AVRDC in GMS

Research (from breeding to processing)

Breeding | Crop management | Fresh produce handling | Processing

Variety trials on station/on farm

Quality/shelf life responses to irrigation

Packaging, storage, special treatments

Drying; sauce processing

AVRDC in GMS

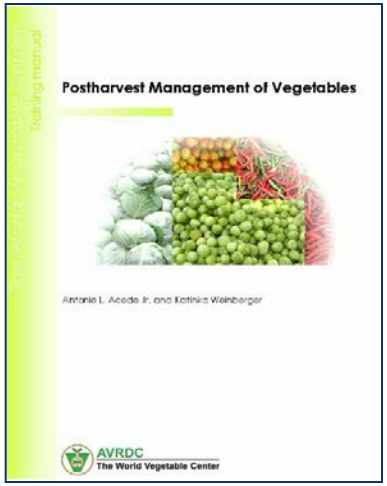
Education (capacity building)

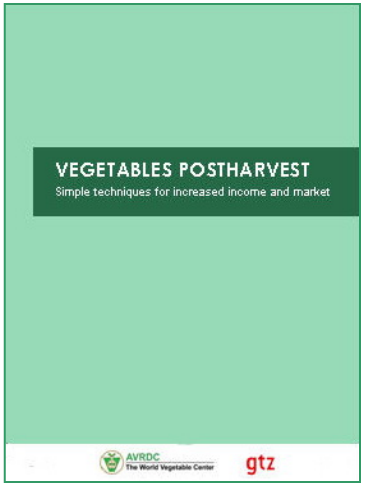
- Training of national partners & PhD program (Cambodia & Laos)
- Study missions and international conference participation
- Postharvest Tech Lab (Cambodia & Laos); upgrading in Vietnam

AVRDC in GMS

Extension

- Trainings of trainers
- Technology end-users trainings
- Model microenterprise development





AVRDC in Asia

AVRDC in Asia

USAID Postharvest

(Tomato, eggplant, cauliflower, mustard)

- Nepal
- Bangladesh
- Cambodia

SDC CHAIN –processing

(fermented & dehydrated products)

USAID AIP – value chain

(Tomato, chili, onion)

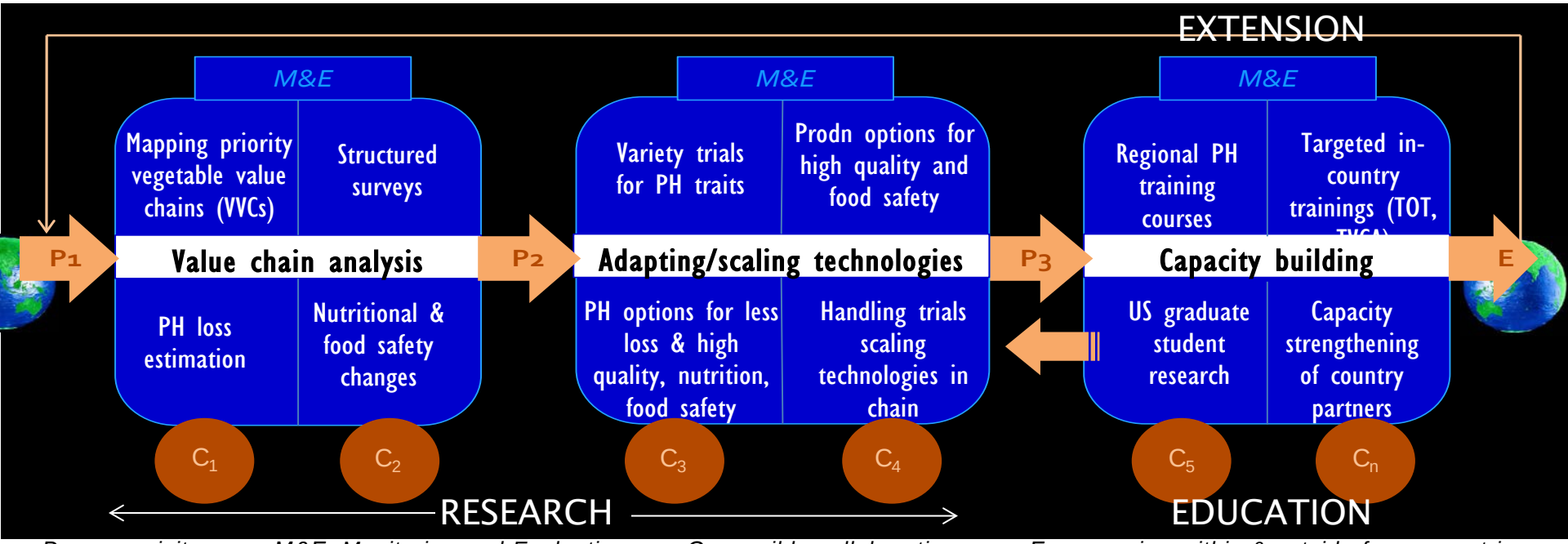
- Pakistan
- India

Karnataka, Maharashtra and Odisha States – value chains

(Tomato, chili, onion)

AVRDC in Asia

Strengthened value chain approach



P: prerequisites *M&E: Monitoring and Evaluation* *C: possible collaborations* *E: expansion within & outside focus countries*

Prerequisites:

P1 - review initiatives, partnering; scope priority value chains; finalize VCA tool; strengthen capacity of country partners (survey research; loss assessment; analysis of quality, nutritional, food safety indicators; WEAI tool); collaborate with other USAID Feed the Future (FTF)/Horticulture Innovation Lab (HIL) (formerly HortCRSP) programs

P2 - validate findings; set priorities; strengthen capacity (research techniques; economic analysis); collaborate with FTF/HIL programs

P3 - develop training packages for regional courses , training of trainers (TOT) and value chain actors (TVCA); collaborate with FTF/HIL programs

AVRDC in Asia

Value chain analysis

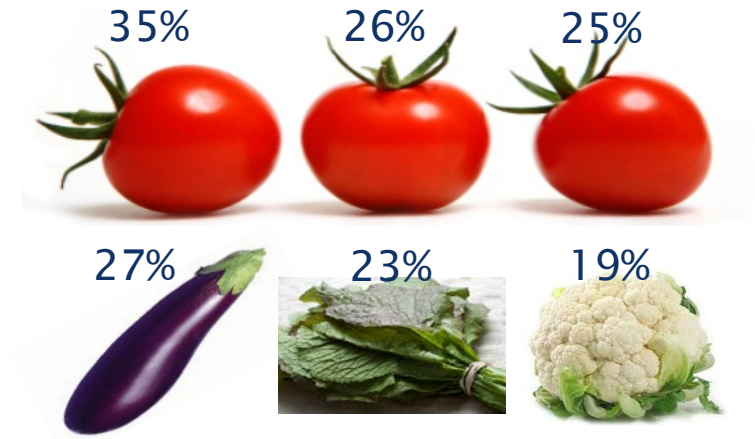
Quantify losses; determine needs and opportunities for intervention

Technology generation

Adapt available technologies to local situation; develop new technologies

Building capacities

Promote technological and organizational interventions



Postharvest losses

- Due to handling, packaging and storage deficiencies
- Value chain actors not exposed to postharvest technologies

AVRDC in Asia

Value chain analysis → **Technology generation** → Building capacities

Good transport and market handling practices

Value addition (solar dryers, fermentation, sauces)

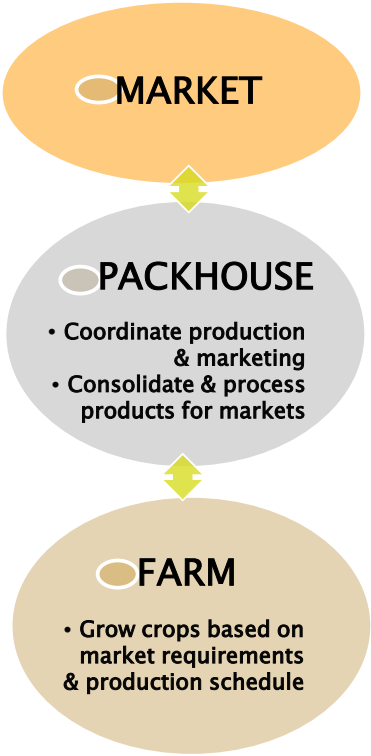
Storage (Coolbot storage; evaporative cooler)

Packaging (MAP, best practices)

Sorting/grading and pretreatment techniques (sanitizer/antimicrobials, precooling)

Good harvesting and field handling practices

Improved varieties (long shelf life, processing)



AVRDC in Asia

Value chain analysis → Technology generation → **Building capacities**

- Trainings, techno demo, field days, agro/trade fairs, consultations
- Student research
- Farm–packhouse–market models

CA farms

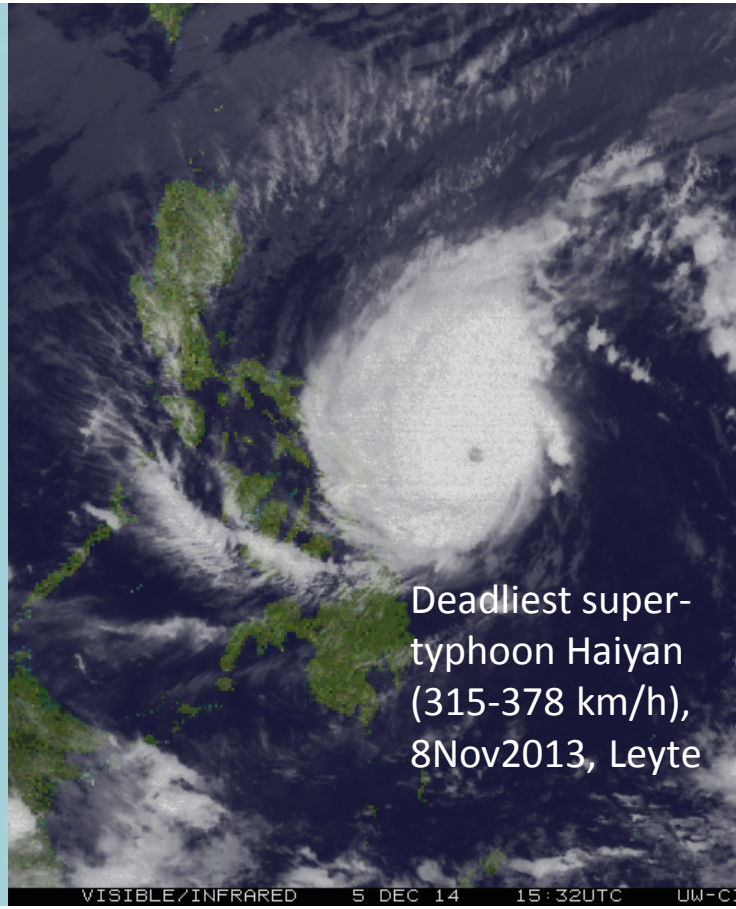
Coolbot–packhouse

AVRDC in Asia

- Collaboration with partners
  - NARES (RUA-Cambodia; BARI-Bangladesh; AFU-Nepal
  - Other national agencies (Departments of Agriculture, Women's Affairs, Agricultural Marketing, Agricultural Extension)
  - Horticulture Innovation Lab (HIL)
  - HIL-CA Project (Cambodia, Nepal)
  - RUA/ADB SPSS Project (Cambodia)
  - ADB-SCDP Project (Bangladesh)
  - AVC Project (Bangladesh)
  - IDE-Nepal
  - ADB-Nepal SME Farmers Project
  - Other NGOs/private sector (Pride-Bangladesh; ADDA-Cambodia; Friends for Peace-Nepal)

Concluding words:

With knowledge, we can overcome even the most difficult.



Thank you for your kind attention!

Thanks also to

USAID FROM THE AMERICAN PEOPLE
HORTICULTURE INNOVATION LAB
UCDAVIS UNIVERSITY OF CALIFORNIA

USAID–Bureau for Food Security, Washington