

## REGIONAL WORKSHOP

Research and Academic Institutions on:

**'Establishing a Cooperation Mechanism for Human Resource Development on Sustainable Agricultural Mechanization'**

# The Philippine Experience



Nanjing International Convention Center  
Nanjing, China  
13-15 April 2017



## Authored & Presented by:



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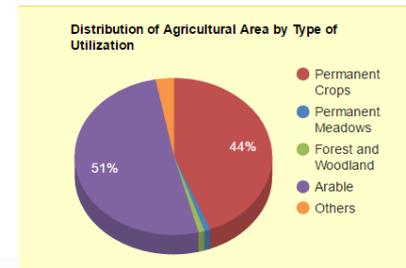
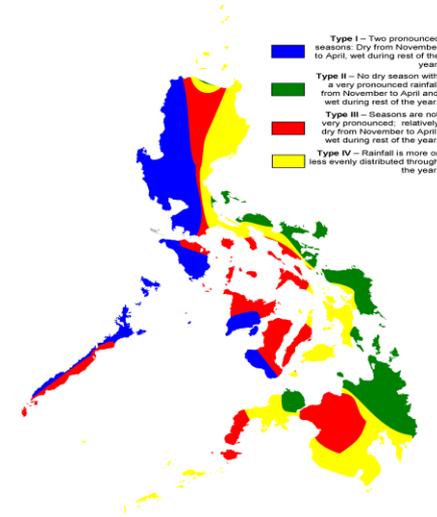
# PRESENTATION OUTLINE

- 1. The Philippines: country background**
- 2. Institutional Background**
- 3. The Philippine Agri-Fisheries Mechanization Workforce**
- 4. Academic, Research and HRD Institutions on Agri-Fisheries Mechanization in the Philippines**
- 5. Suggested Priority Areas for Regional Cooperation**



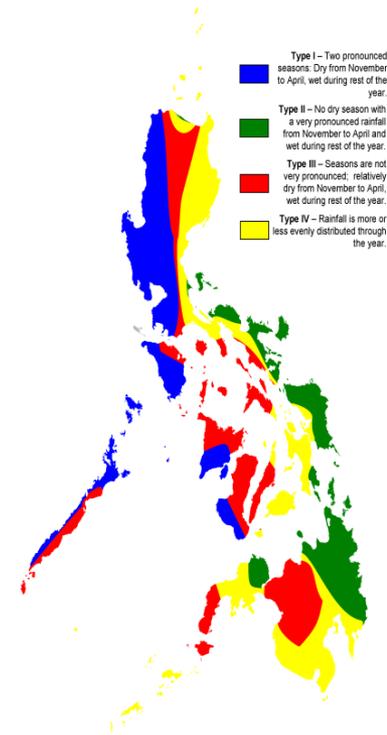
# COUNTRY BACKGROUND

| Item                      | Description          | Data                              |
|---------------------------|----------------------|-----------------------------------|
| Geographical Location     | Latitude : NL        | 4.7 ° N                           |
|                           | : SL                 | 21.5 ° N                          |
|                           | Longitude: EL        | 117 ° E                           |
|                           | : WL                 | 127 ° E                           |
| Meteorological conditions | Temperature          | Min. 26.1 ° C      Max. 28.4 ° C  |
|                           | Annual Precipitation | <b>2000 mm/year</b>               |
| Agricultural Conditions   | Total Area           | 300,000,000 km <sup>2</sup>       |
|                           | Total Land Area      | <b>298,170,000 km<sup>2</sup></b> |
|                           | Total Water Area     | <b>1,830,000 km<sup>2</sup></b>   |
|                           | Agricultural Land    | <b>9,671,000 km<sup>2</sup></b>   |
|                           | Arable Lands         | 4,936,000 km <sup>2</sup>         |
|                           | Permanent Cropland   | 4,225,000 km <sup>2</sup>         |
|                           | Forest land          | 74,000 km <sup>2</sup>            |
|                           | Other lands          | 307,000 km <sup>2</sup>           |
|                           | Agricultural Farms   | <b>4,820,000 farms (2002)</b>     |



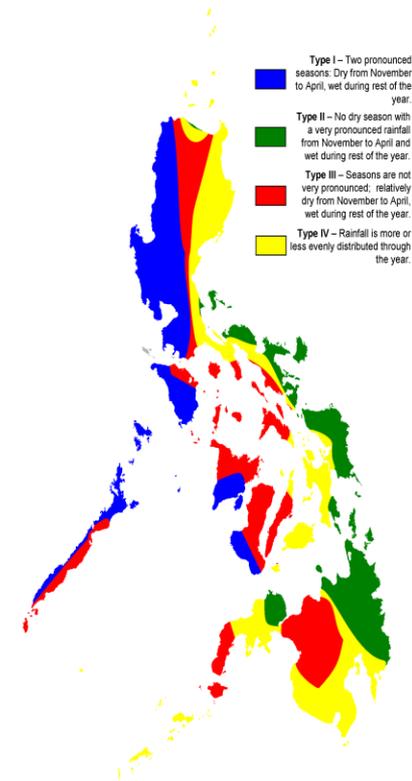
# COUNTRY BACKGROUND

| Item                      | Description                      | Data   |
|---------------------------|----------------------------------|--|
| Agricultural Conditions   | Staple foods                     | <b>RICE: (2015)</b><br><b>Area Harvested: 4.656 million ha</b><br><b>Production: 18.150 MMT</b><br><b>Farm gate Price: P18.04/kg</b> |
|                           |                                  | <b>CORN: (2015)</b><br><b>Area Harvested: 2.562 million ha</b><br><b>Production: 7.518 MMT</b><br><b>Farm gate Price: P12.01/kg</b>  |
|                           | Other staples                    | Root Crops and Plantain  |
|                           | Other major crops                | Sugarcane, Coconut   |
|                           | Top Export crops                 | Coconut Oil (18%), Banana (17%), Tuna (7%) Pineapple & Products (7%)   |
| Population and Employment | Total Population                 | <b>103.500 million</b>   |
|                           | Total Employment                 | 38.65 million  |
|                           | Employment in Agriculture        | <b>11.74 million (share 30.9%)</b>   |
|                           | ABE in agriculture               | <b>8,336 AB Engineers</b>  |
|                           | Skills Machinery operators /tech | <b>1.2 Million</b>   |
|                           | Wage Rates                       | P 252-454 plantation(2016)   |



# COUNTRY BACKGROUND

| Item                                    | Description  | Data   |
|---|--|--|
| Social Conditions                       | Official Language                                  | English & Filipino   |
|   | National Language                                  | Filipino   |
|   | Religion   | Christians / Muslims   |
| Economy (2015)                          | GNI at current prices                              | P 13,851 Billion   |
|   | GDP at current prices                              | <b>P 11,584 Billion</b><br><b>(10% in agriculture with 7.18% growth)</b> |
|   | GVA at current prices<br>(agriculture and fishing) | P1,293 Billion   |
| Mechanization Level (Quick Index, 2012) | For Rice<br>For all crops                          | <b>2.32 hp/ha</b><br><b>1.23 hp/ha</b>                                   |





# Center for Agri-fisheries and Biosystems Mechanization

## BIOMECH

### Vision

Excellence in RDE committed to agri-fisheries and biosystems mechanization in the Philippines responsive to the challenges of food security, energy sustainability, environmental protection, climate change and globalization

**RA 10601 The Agriculture and Fisheries Mechanization Law 2013**

**BIOMECH** to lead and coordinate the agricultural and fishery mechanization RDE program of all academic institutions in the country (Article 3, Section 8)

### Mission

Provide innovative agri-fisheries and biosystems mechanization technologies through: cutting edge research, strategic public service/extension delivery methods; synergistic networking, and responsive policy advocacies, towards environment-friendly, gender sensitive, and sustainable agri-fisheries and biosystems modernization



Technology accessibility and adaptation to agri-fishery communities

RDE activities influencing national policies and plans

Capability building for agri-fishery mechanization

Pubic Service fto agri-fishery sector on mechanization



# Major role of **BIOMECH** in the AFMech Law of 2013 (R.A. 10601)

**Major institution** involve in the formulation of the National Agricultural and Fisheries Mechanization Program (NAFMP) (Article 2, Rule 5.1).

**BIOMECH** as part of the Agri-fisheries Mechanization and Engineering Resource Network (AFMech ERN) that shall be linked to the database of the DA, and other networks (Article 3, Section 10 )

**Co- Chair** of the AFMechRDE Network to lead and coordinate the agri-fishery mechanization RDE program of all HEIs in the country (Article 3 Sec 8 and Rule 8.3).

**Major institution** involve in the formulation of the of the a unified National Agricultural and Fisheries Mechanization Research and Development and Extension (NAFMechRDE) Agenda (Article 3, Sec. 7, Rule 7.1).

**BIOMECH** as part of the national project on contiguous farming which shall be spearheaded DA together with DAR and other agencies concerned, to increase land, labor and crop productivity utilizing agricultural mechanization technologies (Article 9, Rule 34.1).





# Center for Agri-fisheries and Biosystems Mechanization

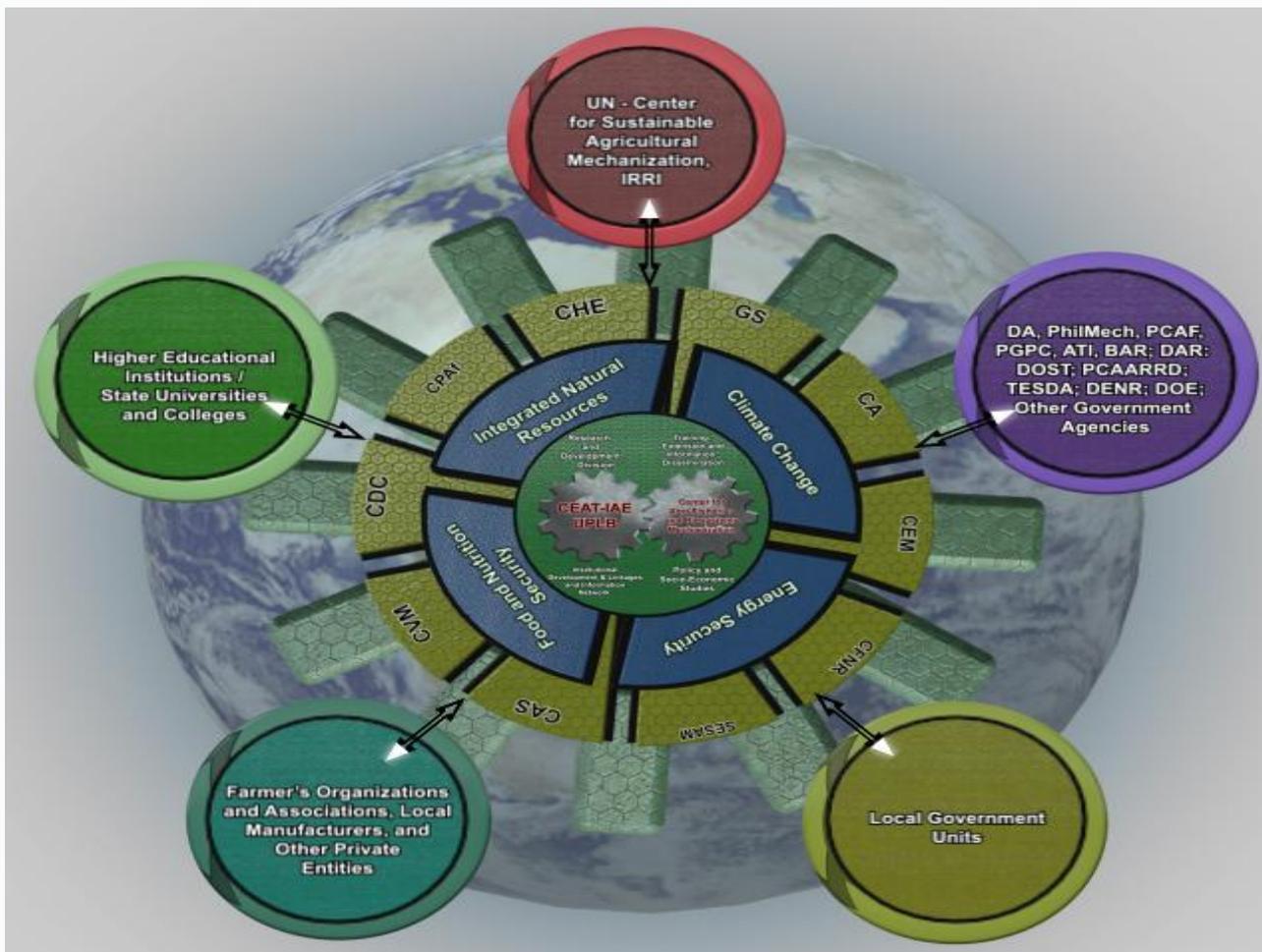
## BIOMECH

| <b>RDE THRUSTS</b>              | <b>SPECIFIC RDE AREAS</b>   |
|---------------------------------|---|
| <b>Food Security</b>            | <b>Crop, livestock and fisheries production mechanization technologies</b><br><b>Precision agriculture and smart farming</b><br><b>Alternative food sources mechanization</b><br><b>Postharvest mechanization</b><br><b>Food and feed processing technology</b><br><b>Aquaculture engineering</b><br><b>Contiguous farming system</b> |
| <b>Energy Sustainability</b>    | <b>Energy-efficient technologies</b><br><b>Renewable energy technology</b>  |
| <b>Environmental Protection</b> | <b>Agro-waste management and utilization</b><br><b>GIS for Mechanization (Agricultural Mechanization Planning and Monitoring)</b><br><b>Soil and water conservation technologies</b>  |
| <b>Climate Change</b>           | <b>Land and water resources engineering</b><br><b>Climate change mitigation and adaptation</b>  |





# Center for Agri-fisheries and Biosystems Mechanization BIOMECH



## BIOMECH WORK ENVIRONMENT





## REGULATED PROFESSIONS (44) :

### Engineering Cluster

- Aeronautical Engineering
- **Agricultural & Biosystems Engineering**
- Chemical Engineering
- Civil Engineering
- Electrical Engineering
- Electronics Engineering
- Geodetics Engineering
- Mechanical Engineering
- Metallurgical Engineering
- Mining Engineering
- Naval Architecture & Marine Engineering
- Sanitary Engineering

### Technology Cluster

- Architecture
- Chemistry
- Environmental Planning
- Fisheries
- Foresters
- Geology
- Interior Design
- Landscape Architecture
- Master Plumbers

### Business, Education & Socials Cluster

- Accountancy
- Criminology
- Custom Brokers
- Guidance and Counseling
- Librarians
- Marine Deck Officers
- Marine Engine Officers
- Professional Teachers
- Psychology
- Real Estate Service
- Social Workers

### Medical and Health Cluster

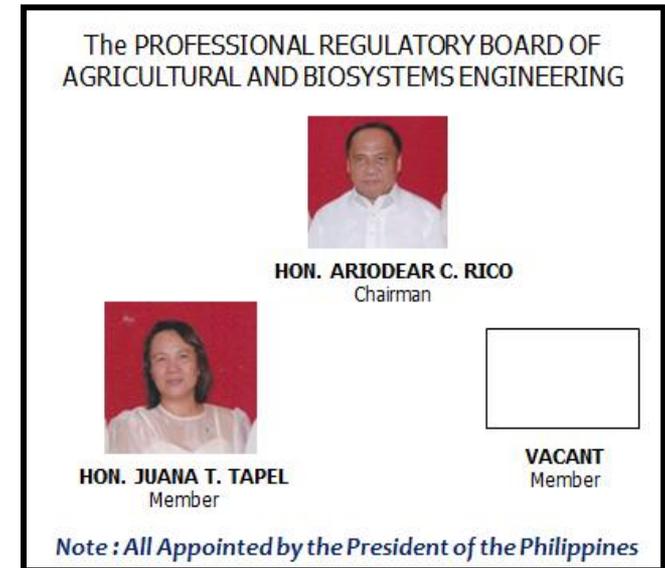
- Dentistry
- Medical Technology
- Medicine
- Midwifery
- Nursing
- Nutrition and Dietetics
- Optometry
- Pharmacy
- Physical Therapy
- Occupational Therapy
- Radiologic Technology
- Respiratory Therapy
- Veterinary Medicine



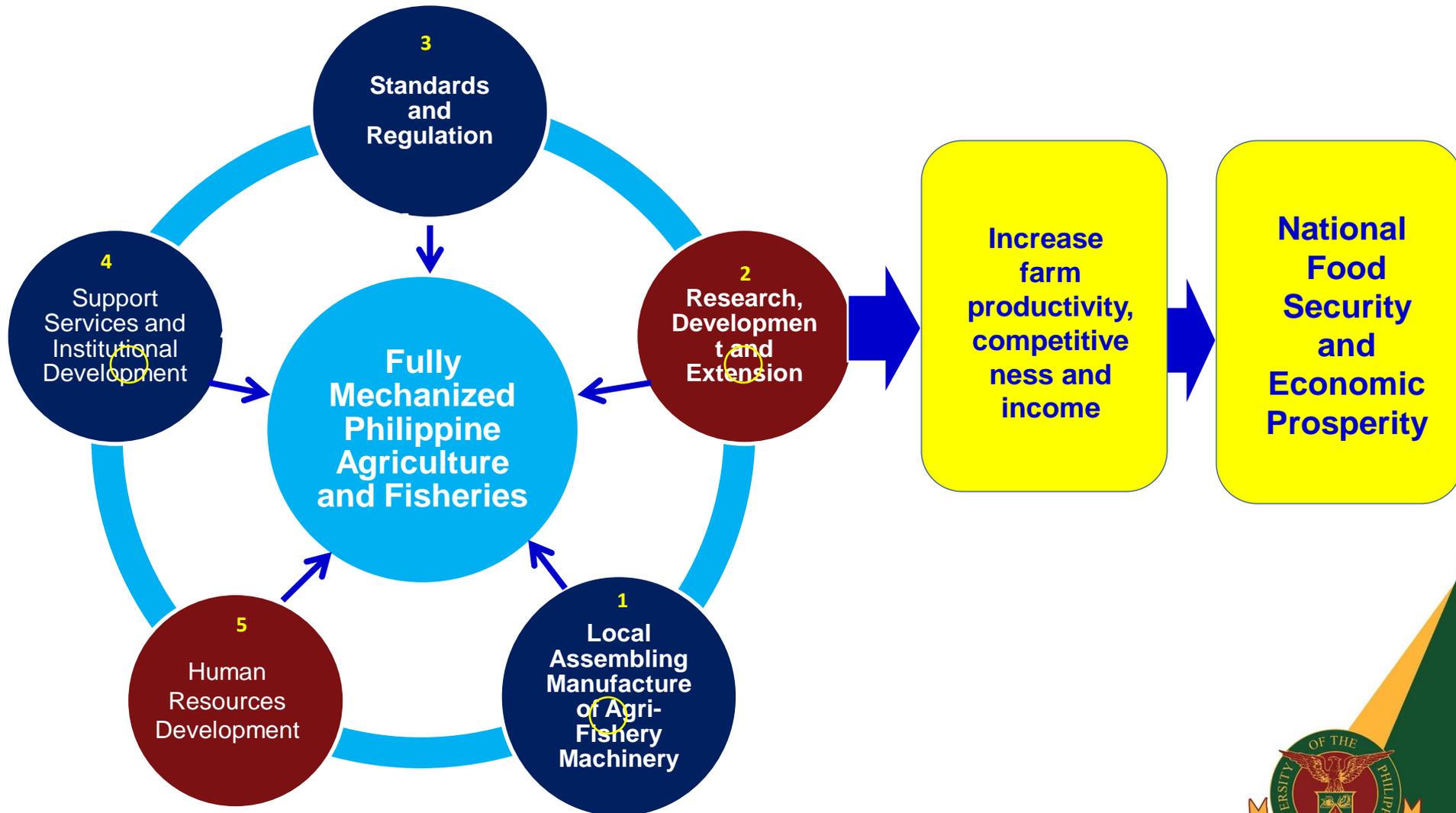
# The PROFESSIONAL REGULATORY BOARD OF AGRICULTURAL AND BIOSYSTEMS ENGINEERING

(Formerly Board of Agricultural Engineering)

- **Created by law, R.A. No. 10915 (Philippine Agricultural and Biosystems Engineering Act of 2016, previously R.A. No. 8559)**
- **Functions:**
  1. Conducts Licensure Examination
  2. Regulates the Practice of Agricultural and Biosystems Engineering



# NATIONAL AGRI-FISHERIES MECHANIZATION PROGRAM 2016-2020



# ACADEMIC, RESEARCH & HRD INSTITUTIONS ON AGRI-FISHERIES MECHANIZATION IN THE PHILIPPINES

## ACADEMIC INSTITUTIONS

- 60 Higher Education Institutions (HEIs) that offers 5-Year BS Agricultural Engineering/Agricultural and Biosystems Engineering Education Program
- 3 HEIs offering the MSAE program
- 2 HEIs offering the PhDAE program
- 1 National University
- 1 AUN- QA Accredited
- 3 Centers of Excellence (COE)

*Supervised by the Commission on Higher Education (CHED)*



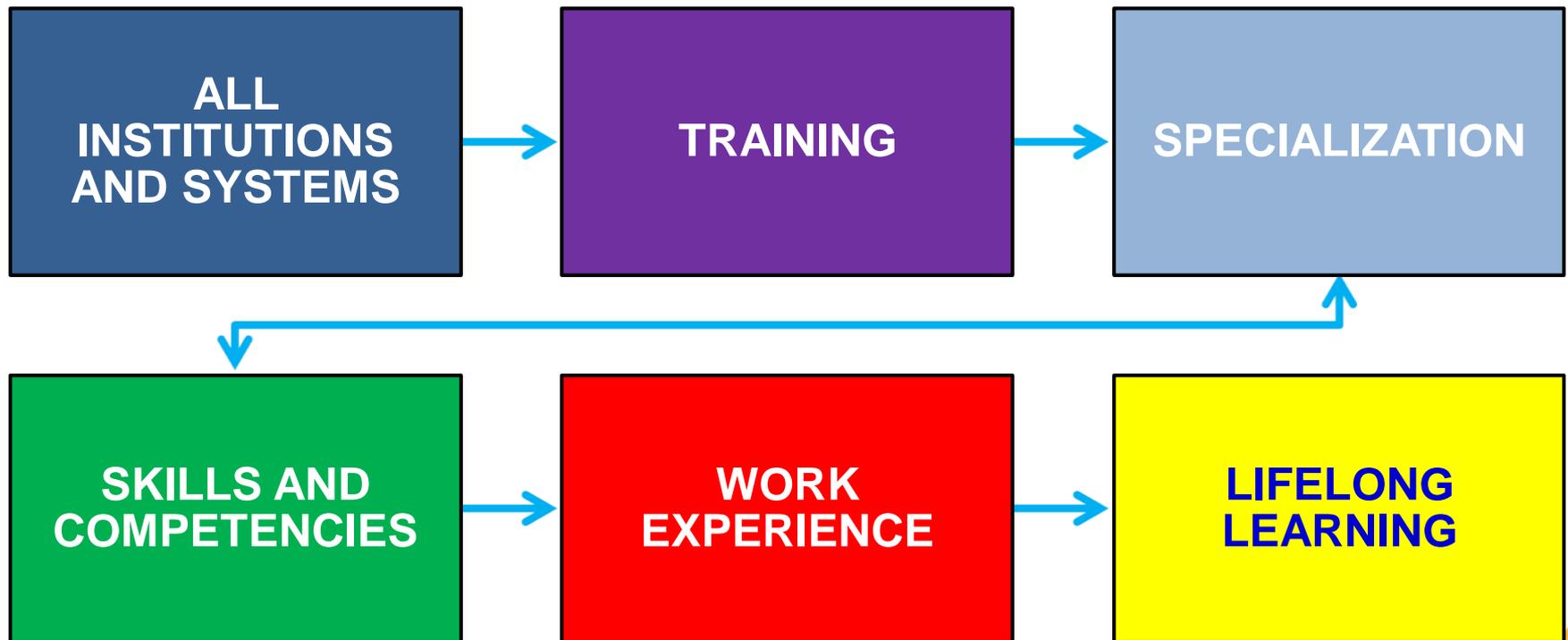
# THE PHILIPPINE QUALIFICATIONS FRAMEWORK (PQF)



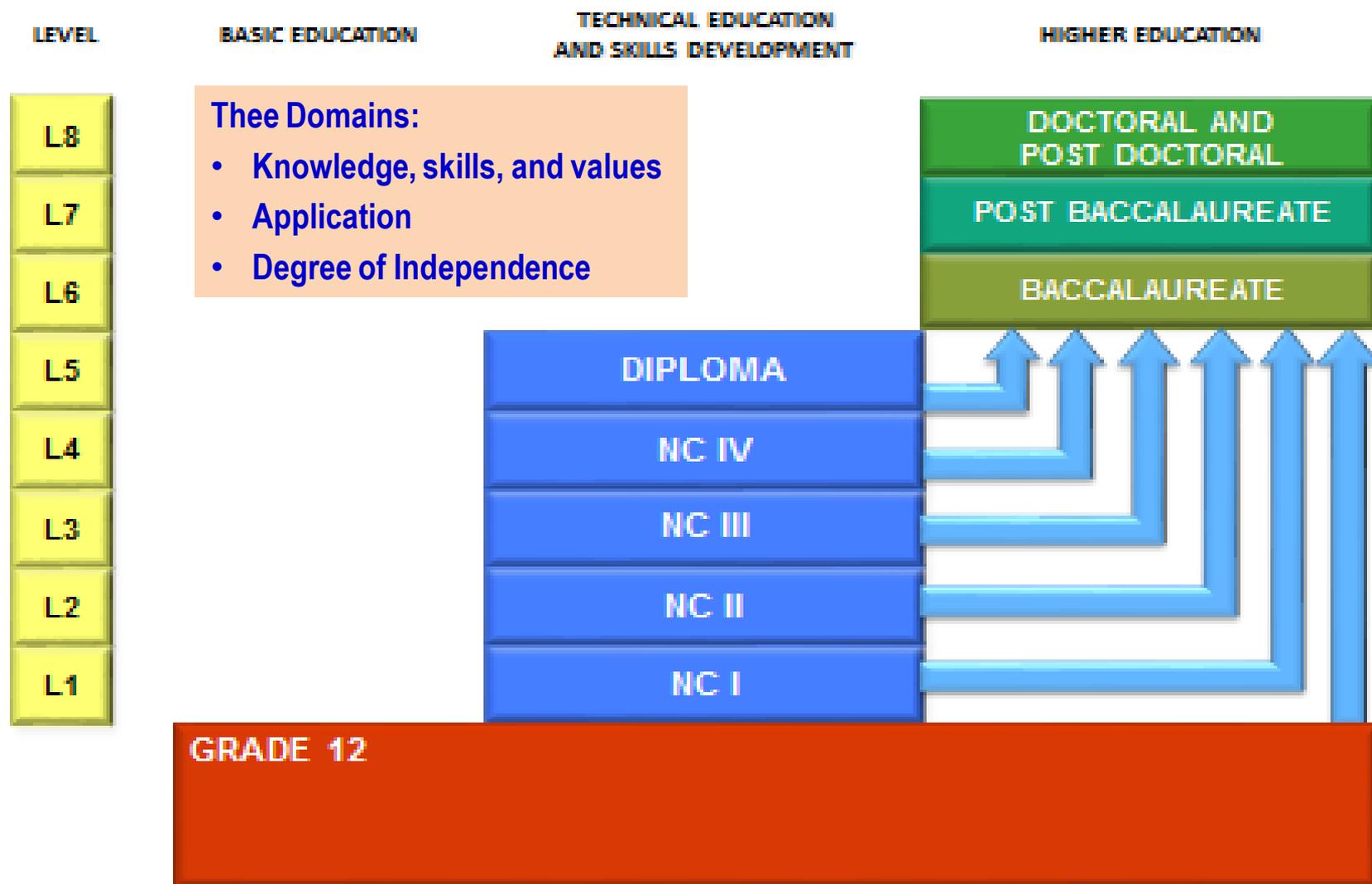
# ACADEMIC, RESEARCH & HRD INSTITUTIONS ON AGRI-FISHERIES MECHANIZATION IN THE PHILIPPINES

## COVERAGE OF PQF

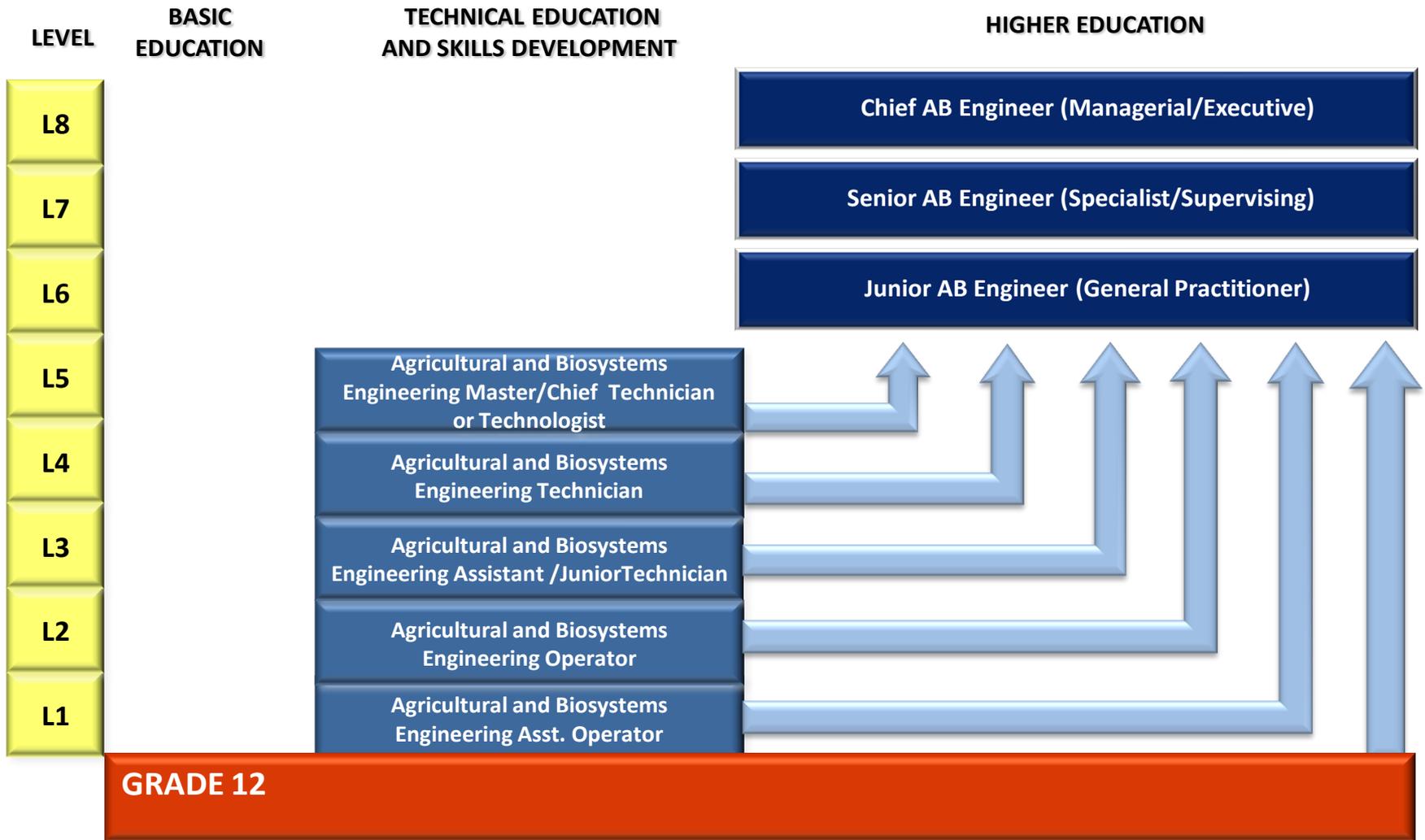
Three levels: Basic Education, Technical & Vocational, Higher Education



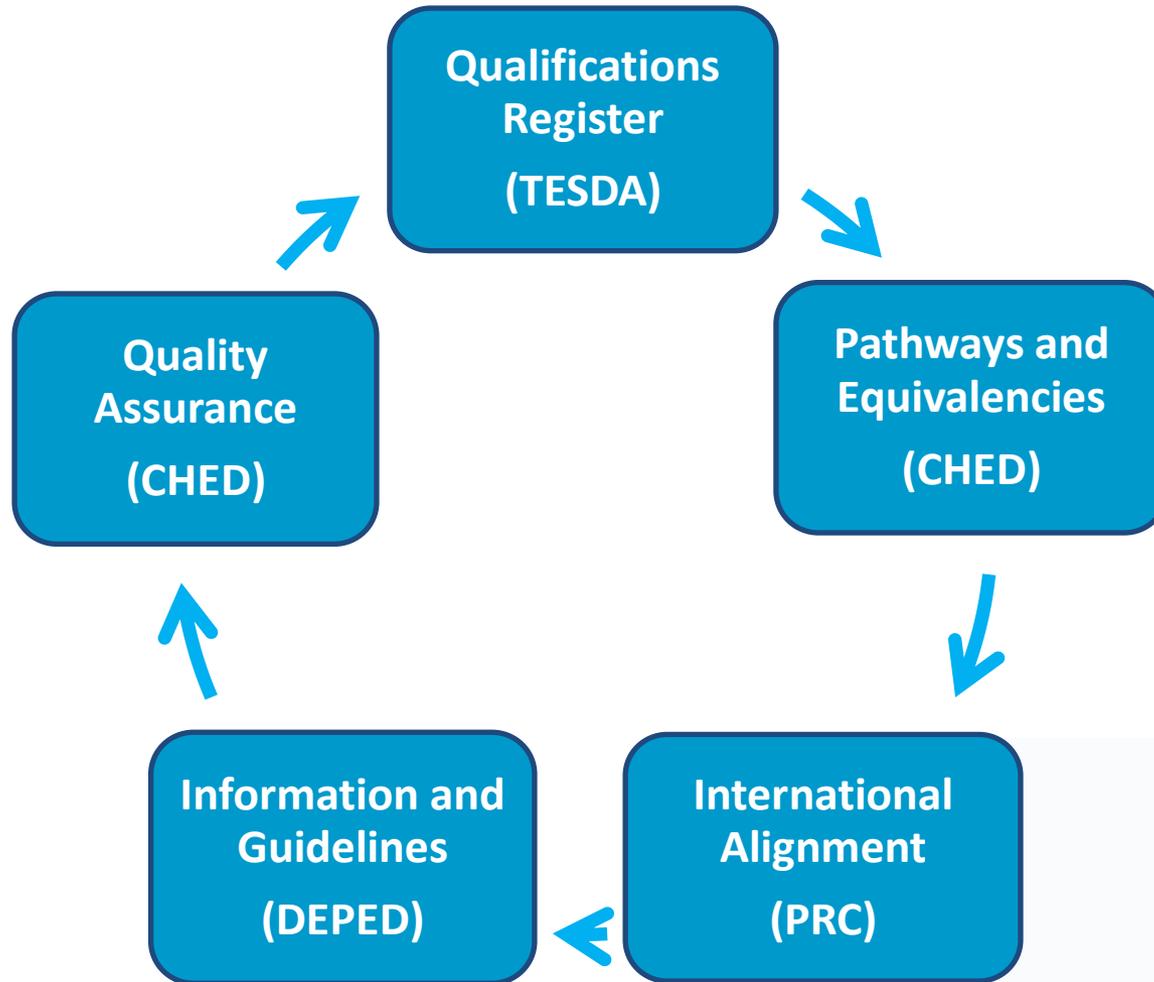
# THE PHILIPPINE QUALIFICATIONS FRAMEWORK (PQF)



# PQF CAREER PROGRESSION



# PQF IMPEMENTING INSTITUTIONS



# ACADEMIC, RESEARCH & HRD INSTITUTIONS ON AGRI-FISHERIES MECHANIZATION IN THE PHILIPPINES

## RESEARCH INSTITUTIONS

- Organized into Agricultural and Fisheries Mechanization Research, Development and Extension Network (AFMechRDEN) composed of:

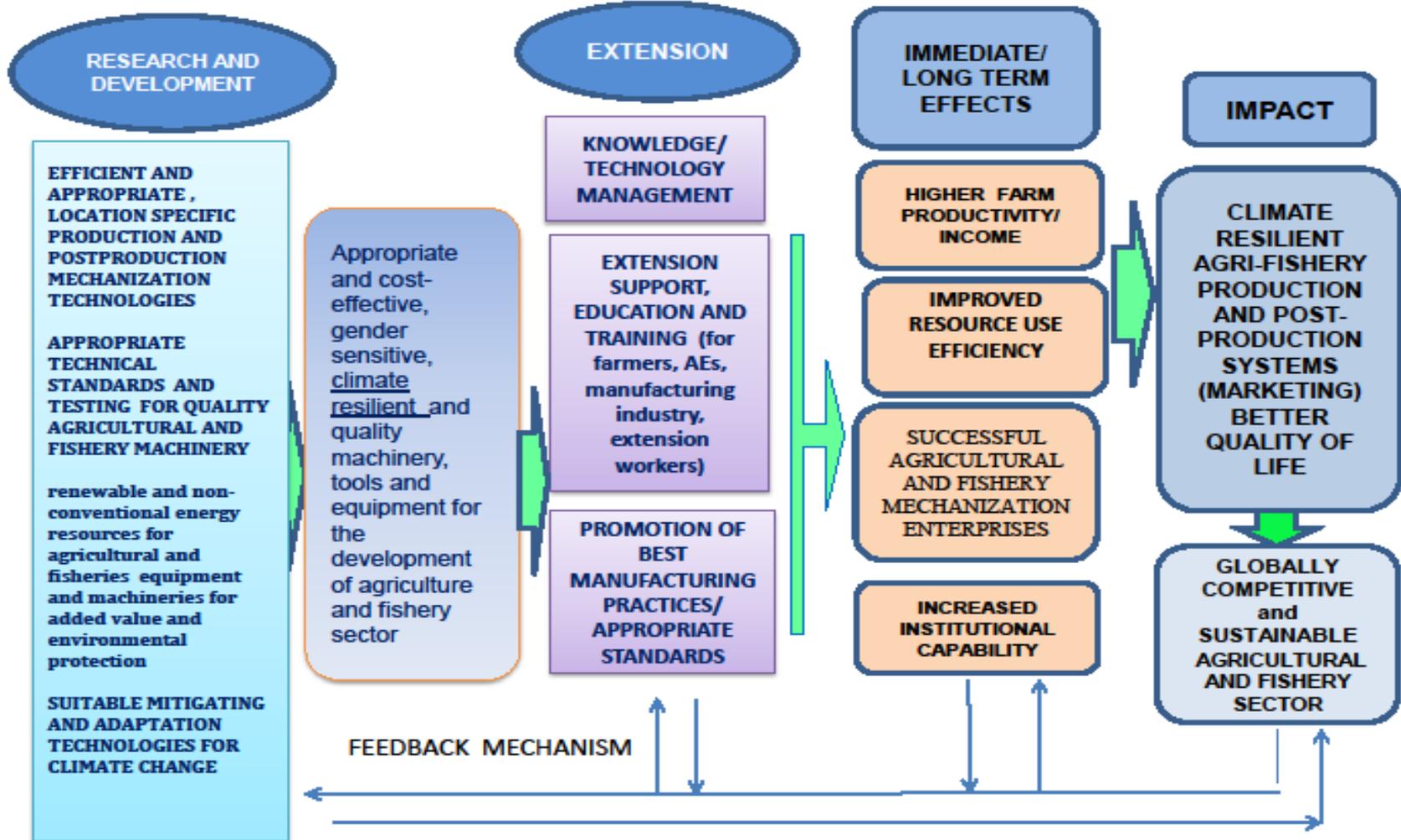
Research Development Institutes (RDIS)  
chaired by Philippine Center for Post Harvest and Mechanization (**PhilMech**)

Higher Education Institutions (HEIs)  
chaired by the UPLB-Center for Agri- Fisheries and Biosystems Mechanization **UPLB-BIOMECH**

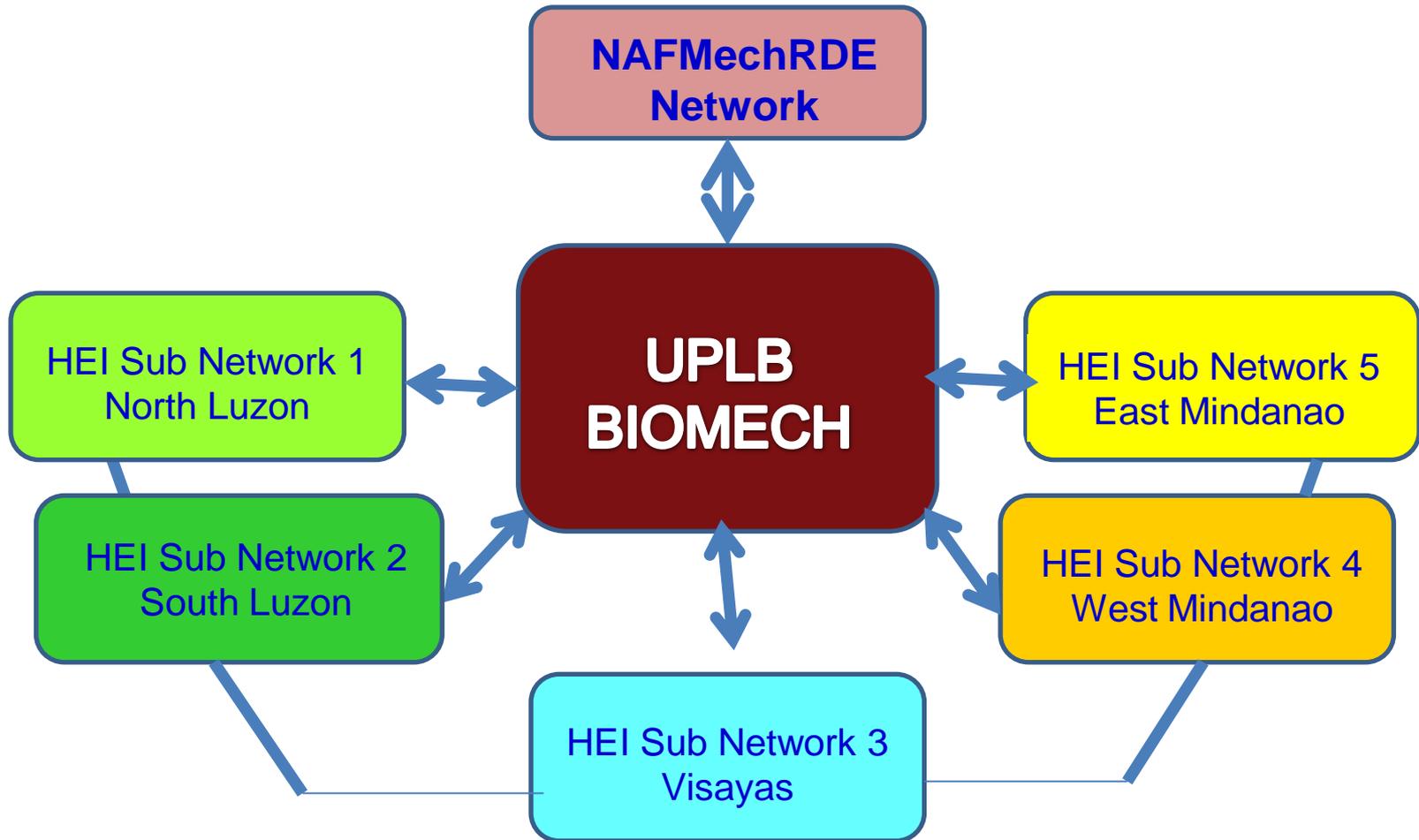


# NAFMechRDE AGENDA

## The RDE Framework



# AFMechRDE Network of the HEIs



**BIOMECH** to lead and coordinate the agri-fishery mechanization RDE program of all HEIs in the country  
(Article 3 Sec 8 and Rule 8.3).



# ACADEMIC, RESEARCH & HRD INSTITUTIONS ON AGRI-FISHERIES MECHANIZATION IN THE PHILIPPINES

## HUMAN RESOURCE DEVELOPMENT (HRD) INSTITUTIONS

- Professional Regulatory Board of Agricultural and Biosystems Engineering (PRB-ABE)

Licensure examination and regulation the practice of Agricultural and Biosystems Engineers

With established:

Philippine Society of Agricultural Engineers



# SCOPE OF PRACTICE OF AGRICULTURAL AND BIOSYSTEMS ENGINEERS R.A. NO. 10916 (PHILIPPINE ABE Law)

## PROFESSIONALS SERVICES

- 1) Plans, designs, prepares and prescribes technical specifications
- 2) Supervise/ manage the construction, operation and maintenance;
- 3) Test, evaluate and inspect
- 4) Conduct Research, training and extension; and
- 5) Conduct feasibility study, Marketing and Consultancy Services

## AGRICULTURAL & BIOSYSTEMS AREAS/FACILITIES



# ACADEMIC, RESEARCH & HRD INSTITUTIONS ON AGRI-FISHERIES MECHANIZATION IN THE PHILIPPINES

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# ACADEMIC, RESEARCH & HRD INSTITUTIONS ON AGRI-FISHERIES MECHANIZATION IN THE PHILIPPINES

## HUMAN RESOURCE DEVELOPMENT (HRD) INSTITUTIONS

- Technical Education and Skills Development Authority (TESDA)
  - ✓ Skills Certification of Agricultural and Fishery Machinery Operators and Technicians
  - ✓ Development and Promulgation of Training Regulations (TRs)



# ACADEMIC, RESEARCH & HRD INSTITUTIONS ON AGRI-FISHERIES MECHANIZATION IN THE PHILIPPINES

## HUMAN RESOURCE DEVELOPMENT (HRD) INSTITUTIONS

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  - ✓ Skills Certification of Agricultural and Fishery Machinery Operators and Technicians
  - ✓ Development and Promulgation of Training Regulations (TRs)



# TESDA TRAINING REGULATIONS (TRs):

## TRAINING REGULATIONS

### Existing/Newly Approved :

- Rice Machinery Operation NC2
- Rubber Processing NC2
- Agricultural Machinery Operation NC2 (Non-Rice)
- Drying and Milling Processing Plant Servicing (NC3)
- Milking Operation NC2



### AGRICULTURAL MACHINERY OPERATION NC II

AGRICULTURE, FORESTRY AND FISHERY SECTOR

TECHNICAL EDUCATION AND SKILLS DEVELOPMENT AUTHORITY  
East Service Road, South Luzon Expressway (SLEX), Taguig City, Metro Manila Philippines

### With TR, for TESDA Board Approval

- Farm Machinery Servicing (Tractor)- NC3
- Irrigation System Installation and Maintenance (NC2)
- Biogas Systems Installation and Maintenance (NC2)
- Hatchery Operation (NC2)

### On-going TR Development

Diploma on ABE- Farm Mechanization (NC5)



# AREAS FOR REGIONAL COOPERATION

- 1) **Exchange of Information/Harmonization of Agricultural Mechanization/ABE Education in Asia and the Pacific**
  - Conduct of workshops and meetings
  - Trainings and scholarships
  - Establishing Credit Transfer Scheme among National Qualification Frameworks e.g. ASEAN Qualifications Framework (AQF)



# AREAS FOR REGIONAL COOPERATION

## 2) Research Collaboration

Development and implementation of collaborative RDE projects for funding by international funding institutions with the assistance from CSAM



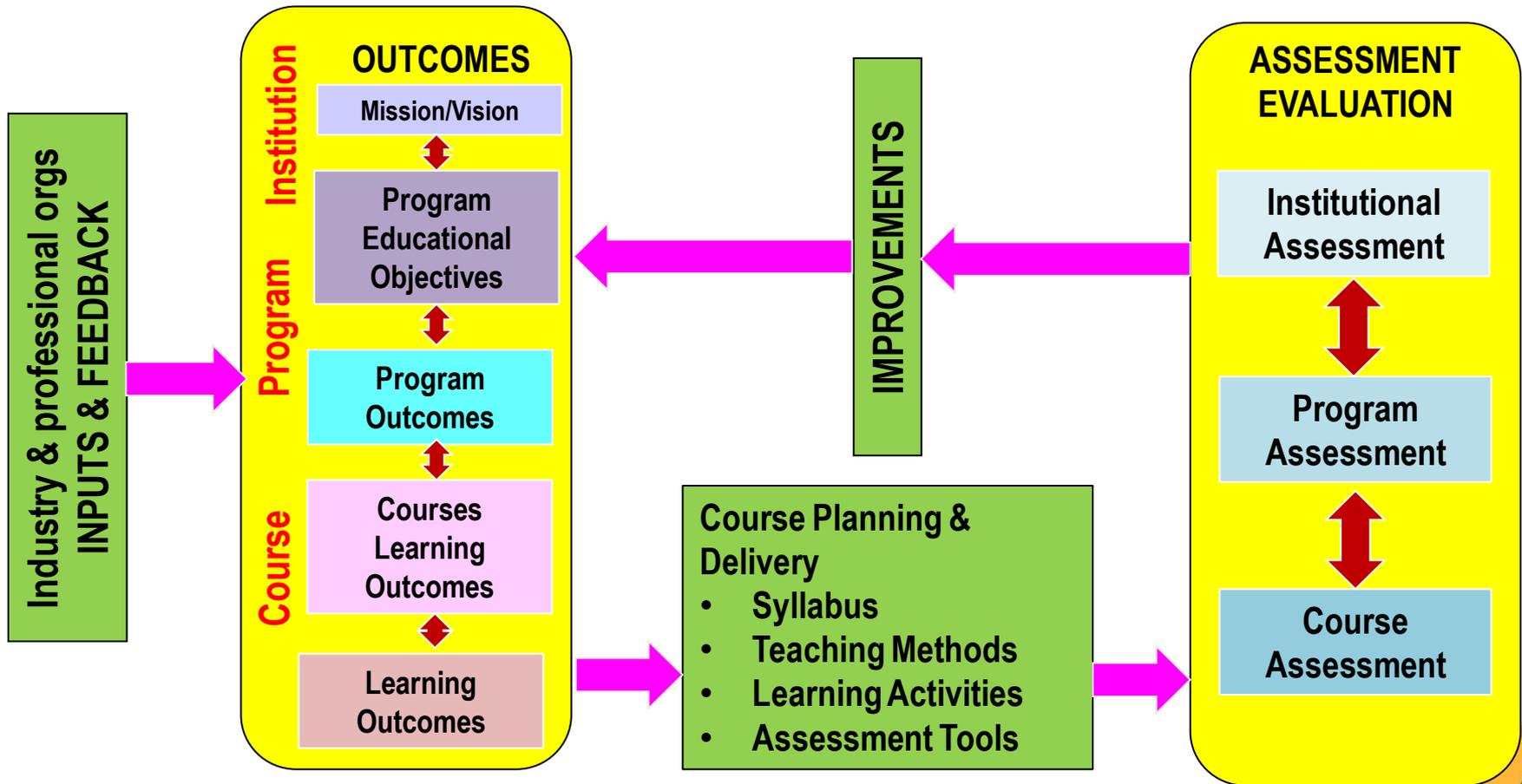
# AREAS FOR REGIONAL COOPERATION

## 3) Facilitating Regional Experts/Services Mobility

- Harmonized ABE Curriculum, competency assessment and accreditation of professionals and agricultural machinery operators and technicians within the region  
( **eg. AUN-QA, Washington Accord- 1989, Dublin Accord – 2002**)
- Manpower Supply and Demand Study for agricultural mechanization services in the region



# AREAS FOR REGIONAL COOPERATION



**QUALITY ASSURANCE- ACCREDITATION**



# AREAS FOR REGIONAL COOPERATION

## 4) Policy Development

Amendment of the UN Central Product Classification (CPC) Version 2.1. to include agricultural and biosystems engineering and agricultural mechanization services



**Thank you very much!**

