The Role of SUCs and Higher Education Institutions in Developing Inventrepreneurs Towards Sustainable Development

DR. CHERRIE MELANIE ANCHETA – DIEGO, CESO III
Director IV, CHED Region 1
“Creativity is the lifeblood of successful entrepreneurs. It bridges new ideas, fosters new relationships, and day-by-day, changes the world.”

– Kelsey Libert
Presentation Outline

- Background: Policies, Education, Sustainable Development
- The Role of Higher Education in Research (SUCs) (RA 7722; CMO No. 46, s. 2012; CMO No. 52, s. 2016)
- Inventrepreneurship
- Way Forward in Higher Education Research

“State policies must promote and develop research, which is a necessary feature of all higher education systems, in all disciplines, including the human and social sciences and arts, given their relevance for development.”
“...good quality education is an essential tool for achieving a more sustainable world.” – UN World Summit, Johannesburg 2002
“The concept of sustainable development is meeting the needs of the present without compromising the ability of future generations to meet their own needs.” – Brundtland, 1987
“Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.”

“Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.”
Section 2. Declaration of Policy. The State shall protect, foster and promote the right of all citizens to affordable quality education at all levels and shall take appropriate steps to ensure that education shall be accessible to all. The State shall likewise ensure and protect academic freedom and shall promote its exercise and observance for the continuing intellectual growth, the advancement of learning and research, the development of responsible and effective leadership, the education of high-level and middle-level professionals, and the enrichment of our historical and cultural heritage.
State-supported institutions of higher learning shall gear their programs to national, regional or local development plans. Finally, all institutions of higher learning shall exemplify through their physical and natural surroundings the dignity and beauty of, as well as their pride in, the intellectual and scholarly life.
CMO No. 46, s. 2012 (Policy-Standard to Enhance Quality Assurance (QA) in the Philippine Higher Education Through an Outcomes-based and Typology-based QA)

Section 1. Philippine higher education is mandated to contribute to building a quality nation capable of transcending the social, political, economic, cultural and ethical issues that constrain the country’s human development, productivity and global competitiveness.
Section 2. This mandate translates to multiple missions for the Philippine Higher Education system:

• To produce thoughtful graduates imbued with: 1) values reflective of a humanist orientation; 2) analytical and problem solving skills; 3) the ability to think through the ethical and social implications of a given course of action; and 4) the competency to learn continuously through life – that will enable them to live meaningfully in a complex, rapidly changing and globalized world while engaging their community and the nation’s development issues and concerns.
• To produce graduates with high levels of academic, thinking, behavioural, and technical skills/competencies that are aligned with national academic and industry standards and needs and international standards, when applicable;

• To provide focused support to the research required for technological innovation, economic growth and global competitiveness, on the one hand, and for crafting the country’s strategic directions and policies, on the other; and
• To help improve the quality of human life of Filipinos, respond effectively to changing societal needs and conditions; and provide solutions to problems at the local community, regional and national levels.
Section 23. Horizontal Typology

Section 23.2. Colleges contribute to nation building by providing educational experiences to develop adults who have the thinking, problem solving, decision-making, communication, technical and social skills to participate in various types of employment, development activities and public discourses, particularly in response to the needs of the communities they serve.
Section 23.3. Universities contribute to nation building to providing highly specialized educational experiences to train experts in the various technical and disciplinary areas and by emphasizing the development of new knowledge and skills through research and development. The focus on developing new knowledge is emphasized from the basic post-secondary academic programs through the doctoral programs; thus, a research orientation is emphasized in the Bachelor, Master’s and Doctoral degree programs. Universities contribute to nation building by producing experts, knowledge and technological innovations that can be resources for long-term development processes in a globalized context.
This CMO articulates the strategic thrusts and pathways that can address the dynamics and challenges in order to fully actualize the potentials of higher education institutions as: a) platforms for knowledge production and advancement, b) engines of development through responsive and relevant research programs, and c) producers of multi-specialists, creators, problem-solvers, collaborators, inventors, thinkers and innovators who can examine phenomena, explore new frontiers, and bring from multidisciplinary and interdisciplinary lenses.
PATHWAYS TO EQUITY

A. Grants-In-Aid Program for Research and Innovation – two fold strategic investment program to develop human resources as researchers and innovators and provide opportunities for HEI consortia or groups to develop a distinctive niche in research and innovation.

B. Grants-In-Aid Program for Extension – an investment in HEIs to develop their capacity and capability to systematically and sustainably work with communities on purposive, focused and innovative approaches to developmental issues such as entrepreneurship, disaster risk reduction, environmental management, etc.
C. Grants-In-Aid for HEI Faculty and Staff Affected by the K-12 “Discovery Applied Research and Extension for Trans/Inter-disciplinary Opportunities (DARE TO) – a competitive enabler seed grant to stimulate strong collaborative research and innovation ventures and sustainable partnerships for extension activities during the K to 12 transition.

PATHWAYS TO RELEVANCE

A. R&I and Extension Grants-In-Aid for National Transformation - based on the 17 SDGs in consonance with the United Nations 2030 Agenda for Sustainable Development.
PATHWAYS TO ADVANCEMENT
A. Establish a Registry of HEI Researchers
B. Observe Research Integrity and Transparency
C. Establish Brain Network-Philippines for Progress (BNPP)
D. Establish the Journal Incentive Program
E. Institute the Philippine Citation Index
F. Adhere to Relevant Philippine Code of Ethics on Research
G. Institute a Biennial Program of Awards and Recognition
H. Develop a **Network** of HEIs in Research, Innovation and Extension
Section 1: National Integrated Basic Research Agenda
Section II: Health
Section III: Agriculture, Aquatic and Natural Resources
Section IV: Industry, Energy and Emerging Technology
Section V: Disaster Risk Reduction and Climate Change Adaptation (DRR&CCA)
The Harmonized National Research and Development Agenda (HNRDA) is divided into five (5) sectors. It is aligned with AmBisyon Natin 2040, and is founded on the three pillars of Malasakit, Pagbabago and Kaunlaran.
**Agendum 1:** Improving research capability of HEIs towards international competitiveness

**Agendum 2:** Enhance research productivity of HEIs in distinctive areas of competence

**Agendum 3:** General knowledge/technologies needed for international, national and regional HE development, policy/plan formulation, developing innovative programs and advancing the frontiers of knowledge in the disciplines

**Agendum 4:** Promote and facilitate dissemination and utilization of research outputs
Agendum 1: Improving research capability of HEIs towards international competitiveness (Strategies)

- Research capability building programs
- Strengthening graduate education in priority disciplines
Agendum 2: Enhancing research productivity of HEIs (Strategies)

• Funding research in and on higher education
• Institutionalization of a system of rewards and incentives for research undertakings and outputs of HEI faculty and researchers
• Journal accreditation service
Agendum 3: Generating new knowledge needed for the advancement of higher education as well as for national development (Strategies)

- Dovetailing higher education research with R&D initiatives of the Department of Science and Technology and other donor/research agencies
- Networking
- Establishment of zonal research laboratories with state-of-the-art facilities and equipment for cutting edge technology research
- Visiting scholars and fellowship program
Agendum 4: Promoting and facilitating dissemination and utilization of research outputs (Strategies)

- Supporting dissemination of research outputs
- Research utilization and technology commercialization programs
Priority Research Areas in Education and Education Management

• Program/curricular studies on higher education
• Policy oriented studies
• Research on quality and standards
• Technology and education
• Model building studies
• Institutional development studies
• Manpower demand and supply studies
• Graduate tracer studies
• Other research topics considered by the Commission in response to merging needs of the country
Priority Themes for Multidisciplinary/Multisectoral Research

- Food safety and security
- Enhancing indigenous renewable energy source in the domestic energy mix
- Development of vaccines and diagnostic kits using indigenous materials
- Disaster risk management
- Pollution control
- Climate change specifically on the issue of global warming
- Future ASEAN
- Peace process and conflict resolution
DISTRIBUTION OF 1,943 HIGHER EDUCATION INSTITUTIONS
AY 2016 - 2017

1,710  71%  Private HEIs
112*  24%  State Universities and Colleges
107**  4%  Local Universities and Colleges
14  1%  Other Gov’t HEIs

* For AY 2017-18, there will only be 111 Main SUCs due to the amalgamation of MUST and MOSCAT to USTSP.
** Out of 107, 17 are CHED-recognized

Reference: Strengthening Philippine Academe-Industry Collaboration Through CHED Research & Extension Programs by Dr. Custer C. Deocaris, Chief, Research Management Division, CHED Central Office
2016 Higher Education Pre-Summit & Education Summit

A. Higher Education as a Force for Social and Cultural Transformation

B. Higher Education as Accelerator of Innovation and Inclusive Economic Prosperity
TRI-FOCAL FUNCTIONS

RESEARCH

INSTRUCTION

EXTENSION

PRODUCTION
“Universities play a fundamental role in establishing and developing an entrepreneurship-oriented economy as they represent the main source of new knowledge. Roles of universities in economic growth have evolved in time and grew beyond their traditional teaching and research tasks...

Universities are anymore expected to introduce solutions to social and industrial needs by exploiting the knowledge that is created by research. Universities even strategically aim to create wealth by investing in business, by building linkages, partnerships with technological enterprises or by creating new firms through academic entrepreneurship.”

What is inventrepreneurship?

Reference: https://www.inventrepreneurship.com/
“Inventrepreneur refers to someone who operates a business based on an invention of his own creation.” – Popoy Pagayon

Reference: Dela Cruz, Roderick T. (2014). Inventrepreneur showcases Filipino inventions, Manila Standards
### RESEARCH

#### GRANT TYPE

<table>
<thead>
<tr>
<th>Regular Grant-in-Aid (Php10 M for 2 years)</th>
</tr>
</thead>
</table>

#### ELIGIBILITY

- Funds R&I projects aligned with the National Higher Education Research Agenda (NHERA)
- Interdisciplinary or Transdisciplinary, involving the convergence of the science, arts and social science
- Must be a member of the Higher Education Network for Research and Innovation Excellence (HENRIE)

CMO No. ____, s. 2018 “Updated Grant Categories and Their New Public Management For Invigorating Research, Innovation and Extension in Higher Education” (under consultation)
<table>
<thead>
<tr>
<th>GRANT TYPE</th>
<th>ELIGIBILITY</th>
</tr>
</thead>
</table>
| Commissioned Projects & Research (CPR) Grant (Php10 M for 2 years) | • To help address data and research needs for higher education policy and to develop tools to improve standards of higher education research & extension management  
• The results and intellectual property from the projects shall be transferred to the Commission following the project agreement. |

CMO No. ___, s. 2018 “Updated Grant Categories and Their New Public Management For Invigorating Research, Innovation and Extension in Higher Education” (under consultation)
<table>
<thead>
<tr>
<th>GRANT TYPE</th>
<th>ELIGIBILITY</th>
</tr>
</thead>
</table>
| Frontier in Research Excellence (FIRE) Grant for Early-Career Researchers | • To provide more focused opportunities for early-career researcher (ECR) by supporting promising interdisciplinary and/or transdisciplinary researches that can strategically enhance prospects for a solid career pathway  
• An ECR is a full-time HEI faculty and researcher who has an academic research experience does not exceed a maximum of four (4) years after completing PhD or equivalent |
<table>
<thead>
<tr>
<th>GRANT TYPE</th>
<th>ELIGIBILITY</th>
</tr>
</thead>
</table>
| International Collaborative Research (ICR) Grant (Php2 15M for 2 years) | • Support sustainable international R&I partnerships either through Joint Bilateral/Multilateral or Unilateral calls  
• Must be member of the Higher Education Network for Research & Innovation Excellence (HENRIE)  
• Must have an ITSO, KTTO or Commercialization Office |
<table>
<thead>
<tr>
<th>GRANT TYPE</th>
<th>ELIGIBILITY</th>
</tr>
</thead>
</table>
| **P.R.E.S.T.I.G.E** | • Support thesis or dissertation research S&T topics justified as beyond that which industry would normally fund or do  
• Must be co-advised by an industry expert  
• The degree-granting HEI must: a) be a member of HENRIE; b) have a functioning ITSO and/or KTTO; and c) have an annual institutional R&D output of at least one hundred (100) publications/patents prior to the year of application |
| **Masters** | Category A Php500,000  
Category B Php 1M |
| **PhD** | Category A Php 1M  
Category B Php 2M |
<table>
<thead>
<tr>
<th>GRANT TYPE</th>
<th>AREAS OF RESEARCH</th>
</tr>
</thead>
</table>
| P.R.E.S.T.I.G.E | Semiconductor & electronics  
• Medical & wellness innovations (biomedical devices coupled to cyber-biological systems, and pharma-manufacturing via cyber-physical systems)  
• Agri-fisheries mechanization coupled to ICT solutions and sensor technologies  
• Entertainment technologies (augmented reality/virtual reality and real-time cloud rendering) |
<table>
<thead>
<tr>
<th>GRANT TYPE</th>
<th>AREAS OF RESEARCH</th>
</tr>
</thead>
</table>
| P.R.E.S.T.I.G.E | ICT in education and neuro-education  
  - Industry 4.0 (robotics and internet of things and/or services (IoTS) combined with big data analytics and/or artificial intelligence, edge computing, block chain, fintech and collaborative consumption)  
  - Other emerging industries that may be associated with Industry 4.0 (3D printing/additive manufacturing and nano/picotechnology) |

CMO No. ____, s. 2018 “CHED PRESTIGE (Paired Research Endeavors in the 4th Industrial Revolution for Graduation Education) Grants for Master’s Thesis and Doctoral Dissertation (under consultation)
## Extension

<table>
<thead>
<tr>
<th>GRANT TYPE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agri-Fisheries Extension Grants Php 10M for 2 years</td>
<td>In 2015, the Commission has allotted additional funds under the HEDF to further strengthen the RDE programs/projects of NAFES institutions that are aimed at improving the country’s food production, achieving food security optimizing the benefits of the blue economy, and fostering inclusive growth and sustainable development.</td>
</tr>
</tbody>
</table>

(CMO No. 26, s. 2016 “Developing Sustainable Agricultural and Fisheries Extensions Programs in NUCAFS and PIAFS)
<table>
<thead>
<tr>
<th>GRANT TYPE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
</table>
| Agri-Fisheries Extension Grants  | • Entrepreneurship education  
• Career advocacy campaigns in agriculture and fisheries for junior high school  
• Computer-aided modalities of delivering agriculture and fisheries extension  
• Blended-learning technologies in agriculture and fisheries extension  
• Developing sustainable farm-to-industry linkages  
• Marketing and financial literacy for farm and fishing communities |

(CMO No. 26, s. 2016 “Developing Sustainable Agricultural and Fisheries Extensions Programs in NUCAFS and PIAFS)
<table>
<thead>
<tr>
<th>GRANT TYPE</th>
<th>ELIGIBILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Block Grants</strong></td>
<td>Php 20M per year for 3 years • Support research &amp; extension (R&amp;E) programs that will capacitate “smaller” HEIs</td>
</tr>
<tr>
<td></td>
<td>• Create competitive niche for the HEI</td>
</tr>
<tr>
<td></td>
<td>• Create impact to the community and industry</td>
</tr>
<tr>
<td></td>
<td>• Must have 5% total faculty force with doctoral degrees</td>
</tr>
<tr>
<td></td>
<td>• Must be member of the Higher Education Network for Research &amp; Innovation Excellence (HENRIE)</td>
</tr>
<tr>
<td></td>
<td>• Must have an ITSO, KTTO</td>
</tr>
</tbody>
</table>

(CMO No. __, s. 2018 “Updated Grant Categories and Their New Public Management for Invigorating Research, Innovation and Extension in Higher Education (under consultation)
SAMPLE INVENTIONS OF SUCs

Pilot Commercialization of Kawayan Tiles and Laminates, MMSU
Prototypeing of Bagoong Squeezer – UNP
Fabrication of Improved Model of Tiger Grass Seed Remover – DMMMSU
SAMPLE INVENTIONS OF SUCs

Packaging Improvement and Shelf Life Study of Fermented Rice-Fish Mixture (Buro) – PSU

Shelf life:
383 days at ambient temperature
SAMPLE INVENTIONS OF PHEIs

Design, Development and Testing of a Prototype Buko Peeler – NWU
SAMPLE INVENTIONS OF SUCs

Automated Hot Water Treatment for Mango – MMSU
What is in store for 2018 and beyond?
- Unity of research with teaching and extension
- Concept of the 21st century Humboldtian education
- Cultivate the networks of research excellence and research agenda
- Data–driven (science of research policy) and comparative policy analysis
- Global competitiveness and international scholarly standards
- Enabler of evolution of bona fide research and innovation universities
- Revival of the culture of curiosity and creativity

Reference: Strengthening Philippine Academe-Industry Collaboration Through CHED Research & Extension Programs by Dr. Custer C. Deocaris, Chief, Research Management Division, CHED Central Office
National Higher Education Research Agenda (NHERA) III (2019-2028)

“Neuron-Muscle Fiber Model”

Reference: Strengthening Philippine Academe-Industry Collaboration Through CHED Research & Extension Programs by Dr. Custer C. Deocaris, Chief, Research Management Division, CHED Central Office
Re-defining Higher Education Extension as a Tool for Social Innovation

PRINCIPLES

1. Inclusive and should cut across or link different sector or disciplines; interdisciplinary undertaking.
2. Beyond the idea of corporate social responsibility, it should be a tool for social innovation and transformation.
3. Beyond the land grant concepts, it must embrace the 21st century tools, structures and challenges.
4. There has to be a methodology that will measure the impact of extension depending on the timeframe.

Reference: Strengthening Philippine Academe-Industry Collaboration Through CHED Research & Extension Programs by Dr. Custer C. Deocaris, Chief, Research Management Division, CHED Central Office
Reference: Strengthening Philippine Academe-Industry Collaboration Through CHED Research & Extension Programs by Dr. Custer C. Deocaris, Chief, Research Management Division, CHED Central Office
Harmonizing Equity and Access to Higher Education Researchers (HEATHER) is a digital library of thesis (Bachelor’s and Master’s) & dissertation in Philippine higher education. It also houses the Philippine Citation Index for all local journals under CHED JIP. It has an intelligent system that will provide a big picture of the research direction/alignment, performance, gaps and other data that may be helpful for policy-makers and other stakeholders. HEATHER is supported by HB 4225 and HB 1455 by Rep. Velara (Quezon City).

Reference: Strengthening Philippine Academe-Industry Collaboration Through CHED Research & Extension Programs by Dr. Custer C. Deocaris, Chief, Research Management Division, CHED Central Office
Connecting Higher and TVET Education Learning Outcomes and Institutional Standards to Graduate Employability (CHLOIE) is part of the Philippines involvement with APEC’s QUILT Project that aims to collect data on indicators for quality of institutions, learning and students graduates. CHLOIE is an innovative interactive system that will track graduate employability and gather inputs from employers to match learning outcomes and competencies.
"Every family, every student, every employer deserves to know CHLOIE."

Reference: Strengthening Philippine Academe-Industry Collaboration Through CHED Research & Extension Programs by Dr. Custer C. Deocaris, Chief, Research Management Division, CHED Central Office
GRETA (Gateway for Researchers’ Engagement in Transnational/Inter-Sectoral Alliances) is an intelligent system that will facilitate research and innovation collaboration. It consists of 3 data systems: Registry of Researchers (local and international), Registry of industries (DTI), and BNPP – brain network Philippines for progress – a database of the Filipino intellectual diaspora. GRETA will monitor and extract themes from past and current research activities of scientists, facilitate research and industry collaborations and track their impact. CHED shall only fund researchers and collaborative networks that are part of the registry.

Reference: Strengthening Philippine Academe-Industry Collaboration Through CHED Research & Extension Programs by Dr. Custer C. Deocaris, Chief, Research Management Division, CHED Central Office
CARMI (CHED Agile Research & Extension Monitoring & Evaluation Intelligent) system will be the sexy and interactive research & extension manager of RMD. CARMI will help grantees meet their project milestones by doing follow-ups via phone, SMS and email. CARMI can help CHED RMD in the monitoring & evaluation activities by creating an optimized calendar of activities. The success of CARMI will lie on gamification of project outcomes based on RIPE metrics to push everyone toward research & innovation excellence. A sub-component of CARMI is MS. HENRIE (Monitoring System for the Higher Education Network for Research & Innovation Excellence) that will track performance, grant applications, R&D expenditures and other indicators to help RMD monitor the progress of HENRIE CARMI is also a clearing house for research projects to optimize funding utilization and avoid duplication.

Reference: Strengthening Philippine Academe-Industry Collaboration Through CHED Research & Extension Programs by Dr. Custer C. Deocaris, Chief, Research Management Division, CHED Central Office
PROJECT PRIUN
Philippine Research & Innovation University Network


Philippine Research & Innovation University Network (PRIUN) (2023)

Zonal Research Centers (ZRCs) (2000-2011)

Reference: Strengthening Philippine Academe-Industry Collaboration Through CHED Research & Extension Programs by Dr. Custer C. Deocaris, Chief, Research Management Division, CHED Central Office
THERE IS NOTHING MORE BEAUTIFUL THAN SOMEONE WHO GOES OUT OF THEIR WAY TO MAKE LIFE BEAUTIFUL FOR OTHERS.

- MANDY HALE
Thank you.