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ON HIGHER EDUCATION ROADMAP, INDUSTRY, AND AGRICULTURE

# Strengthening Higher Agriculture Educational Institutions and Vocational-Technical Training Programs on Entrepreneurship

## for Greater Contribution Towards Agriculture and Fisheries Productivity

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UP PRESIDENT
**EDGARDO J. ANGARA**
FELLOWSHIP

The **UP President Edgardo J. Angara (UPPEJA) Fellowship** is a grant for pioneering policy research. It aims to promote high-level policy discussions and research on a wide range of topics that address national development goals and imperatives, such as science and technology, economic development, environment and climate change, good governance, and communications.

The Fellowship was established by the University of the Philippines Board of Regents on September 29, 2008 in honor of the late Senator Edgardo J. Angara, who served as UP President from 1981 to 1987 and concurrent UP Diliman Chancellor from 1982 to 1983.

Angara, also a former Senate President, is known for his contributions to Philippine education, serving as the Chairperson of the First Congressional Commission on Education in 1990, which was credited with a number of pioneering reforms in the education sector, including its “trifocalization” and the Free Higher Education Act.

In addition to his notable contributions as a legislator, Angara’s leadership also gave rise to the **UP Center for Integrative and Development Studies (CIDS)**, which he initiated during his presidency.

Officially established on June 13, 1985, and originally called the University Center for Strategic and Development Studies (UCSDS), CIDS serves as a think tank that leverages the multidisciplinary expertise of UP to address the nation's most pressing challenges. The core objectives of CIDS encompass the development, organization, and management of research on national significance, the promotion of research and study among various university units and individual scholars, the securing of funding from both public and private sources, and the publication and wide dissemination of research outputs and recommendations.

For 2024, the Higher Education Research and Policy Reform Program (HERPRP) served as the UP PEJA Fellowship Awards secretariat in partnership with the Second Congressional Commission on Education (EDCOM II).

# From the Executive Director of UP CIDS

It has been a long time in the making, but I am pleased to see the UP PEJA Fellowship finally coming to fruition. After all the forums, meetings, presentations, and threads of communication between and among the PEJA Fellows, UP CIDS' Higher Education Research and Policy Reform Program (HERPRP), and the Second Congressional Committee on Education (EDCOM 2), we now have a series of papers that tackle the various facets of Philippine higher education. The series includes the study you're reading.

For much of its history, the UP PEJA Fellowship has been housed in and implemented through the Center for Integrative and Development Studies (CIDS), the University of the Philippines' policy research unit. Over the years, the Fellowship has funded and published the studies of policy scholars, many of them luminaries in their respective fields.

In 2023, after a few years' hiatus, not least because of the COVID-19 pandemic, the UP PEJA Fellowship resumed and began looking for a new set of Fellows. This time, however, UP CIDS, through its Higher Education Research program, embarked on a historic partnership with the Second Congressional Committee on Education (EDCOM 2).

Linking directly with the government in administering the UP PEJA Fellowship was a first for UP CIDS. And that this was a partnership with a national-level policy-making body made it even more special.

As I have always maintained, this type of linkage is exactly what UP CIDS, as a policy research unit, must do: embedding research within a framework of stakeholder engagement.

Guided by the policy objectives of EDCOM 2, the PEJA papers not only tackle the complex issues in education, but also show stakeholders – the state, civil society, and the teachers themselves – how we can tackle them. For all our efforts in improving education in the Philippines, what else can and should we do?

Many thanks to the PEJA fellows for their valuable contribution, and to the UP CIDS Higher Education Research Program for shepherding this important undertaking. With collaboration, great things do happen.

**Rosalie A. Hall, PhD**
*Executive Director*
*UP Center for Integrative and Development Studies*

# From the Convenor of UP CIDS-HERPRP

We at the Higher Education Research and Policy Reform Program serve as a convening body that builds partnerships and networks that pursue a shared research agenda and build an evidence basis for policy. Our activities include fellowships for scholars who publish with us and consultancies for junior researchers who wish to begin a career in higher education studies. We maintain databases, conduct events, and publish various manuscripts on higher education.

For 2024, our full attention was devoted to the UP PEJA Fellowship Program, serving as a secretariat for the researchers who studied higher education as it intersected with government and finance, industry and agriculture, regulation and tuition and technical and vocational education, training and lifelong learning, the UP PEJA Program awards grants for pioneering work on a wide range of topics that address national development concerns. This was the very first time that the program focused on a singular topic. This demonstrates the commitment of the University of the Philippines to higher education.

With the support of the UP Foundation, we have assembled what we have been calling the *Avengers* of Philippine education. They are preeminent scholars whose findings and recommendations directly address key policy concerns. Their papers at once draw from empirical data as well as their professional expertise for which they have been identified as a UP PEJA fellow.

**Fernando dlC. Paragas, PhD**
*Convenor*
*Higher Education Research and Policy Program*
*UP Center for Integrative and Development Studies*

# Letter from the Executive Director of EDCOM II

The **Second Congressional Commission on Education (EDCOM II)** is collaborating with scholars across various institutions to provide valuable insights for the development of evidence-based policies that address the unique challenges and opportunities in the Philippine education landscape.

Our commitment to excellence, integrity, and ethical conduct in advancing research and disseminating knowledge, which we share with our research partners, is defined by the following principles:

The Commission is dedicated to upholding the highest standards of academic rigor in the evaluation, review, and dissemination of research publications. Our pledge is to ensure the integrity and quality of the knowledge we contribute to the scholarly community.

The Commission is committed to fostering transparency and data integrity in all aspects of research. This includes transparent communication, disclosure of methodologies and data sources, and providing clear guidelines to authors, reviewers, and the broader academic community.

The Commission promotes ethical research conduct, emphasizing the responsible and respectful treatment of research participants.

The Commission places a strong emphasis on accessibility. We are committed to facilitating the translation of research findings into accessible formats in order to engage the broader public, taking into account ethical and legal considerations. Our goal is to promote public understanding and awareness of scientific advancements.

In adherence to these principles, the members of the Second Congressional Commission on Education (EDCOM II) pledge to be stewards of good scholarly research for a better, more inclusive educational system for the Filipino people.

**Karol Mark R. Yee, PhD**
*EDCOM II Executive Director*

## Declaration of Funding

This research was conducted in collaboration with the Second Congressional Commission (EDCOM II).

The funding source played no role in the design of the study, data interpretation, or decision to publish the findings as the author(s) maintained complete autonomy in the research process, ensuring objectivity and impartiality in the presentation of results.

## Declaration of Interest

None

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# List of Acronyms or Abbreviations

| | |
|---|---|
| **ADB** | Asian Development Bank |
| **AF** | Agriculture and Fishery |
| **AFF** | Agriculture, Fishery and Forestry |
| **BAR** | Bureau of Agriculture Research |
| **CHED** | Commission on Higher Education |
| **DA** | Department of Agriculture |
| **DOST** | Department of Science and Technology |
| **DTI** | Department of Trade and Industry |
| **EO** | Executive Order |
| **FAO** | Food and Agriculture Organization |
| **FDA** | Food and Drugs Authority |
| **FDI** | Foreign Direct Investment |
| **GEM** | Global Entrepreneurship Monitor |
| **GDP** | Gross Domestic Product |
| **HEI** | Higher Educational Institution |
| **HAEI** | Higher Agriculture Educational Institution |
| **MSME** | Micro, Small and Medium Enterprise |
| **OECD** | Organization on Economic Cooperation and Development |
| **PCCI** | Philippine Chamber of Commerce Inc. |
| **PSA** | Philippine Statistics Authority |
| **PLWFS** | Philippine Labor Work Force Survey |
| **RA** | Republic Act |
| **R&D** | Research and Development |
| **SUC** | State University and Colleges |
| **TBI** | Technology Business Incubation |
| **TVI** | Technical Vocational Institutions |
| **TVET** | Technical Vocational Education and Training |
| **TESDA** | Technical Education and Skills Development Authority |
| **UNCTAD** | United Nation Trade and Development |
| **UP** | University of the Philippines |
| **WB** | World Bank |

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# Strengthening Higher Agriculture Educational Institutions and Vocational-Technical Training Programs on Entrepreneurship

## for Greater Contribution Towards Agriculture and Fisheries Productivity

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## Executive Summary


- This study investigated how tertiary educational institutions can better contribute towards improving agriculture and fishery productivity in the Philippines.

- The low agriculture and fisheries productivity in the Philippines can be attributed primarily to limited entrepreneurial agribusiness, which is a function of the intellectual human capital in agri-entrepreneurship present in the countryside.

- There is a "mismatch" in the educational preparation and training of graduates from tertiary agriculture and fisheries educational institutions and technical vocational institutions for them to be able to recognize, exploit, and benefit from the agribusiness opportunities in the countryside.

- Graduates are educated and trained for employment rather than agri-entrepreneurship. Because of the limited employment opportunities in agriculture and fishery in rural areas, tertiary and TVET graduates seek employment in other industry sectors.

- While there are initiatives by tertiary education institutions and technical-vocational institutions to provide support and incorporate entrepreneurship in existing educational and training programs, further calibration is needed to address the constraints preventing rural youth from practicing agri-entrepreneurship in their respective communities.

- The rural youth have limited financial and social resources. Thus, there is a need to develop access to distant larger markets and address their urgent need to generate income for daily subsistence. In partnership with the private sector, appropriate education and training programs integrated with business support services must be crafted to support and guide the rural youth.

- For tertiary educational institutions and TVET institutions to have greater impacts in improving agriculture and fishery productivity, the following intervention programs should be considered:

    - Create a "National Agri-Entrepreneurship Council for Education & Rural Business Development."

- Capacitate and strengthen selected higher agriculture educational institutions (HAEIs) in different strategic regions in the country by developing a *"Professional Studies in Agriculture Entrepreneurship"* program; transforming HAEIs' farms into a *"Technology Incubation and Agro-industrial Business Park;"* and, establishing a *"Business Development Service Office"* within the technology incubation and agro-industrial business park.

- To develop human intellectual capital and agri-entrepreneurship in the countryside, TESDA must align and strengthen its agriculture and fisheries TVET programs and business support services, taking into consideration the particular needs of the rural youth.

## Highlights

- The low agriculture and fisheries productivity in the Philippines can be attributed primarily to limited entrepreneurial agribusiness, which is a function of the intellectual human capital in agri-entrepreneurship present in the countryside.

- There is a "mismatch" in the educational preparation and training of graduates from tertiary agriculture and fisheries educational institutions and technical vocational institutions. This mismatch hinders them from being able to recognize, exploit, and benefit from the agribusiness opportunities in the countryside.

- The rural youth are financially and socially constrained by limited access to friendly credit, poor access to distant larger markets, and the urgent need to immediately generate income for daily subsistence. Thus, appropriate education and training programs, coupled with business support services, must be crafted to guide the rural youth in their agribusiness practice.

- The following intervention programs should be considered by tertiary educational institutions and TVET institutions:

  - Create a *"National Agri-Entrepreneurship Council for Education & Rural Business Development."*

  - Together with the private sector, capacitate and strengthen selected higher agriculture educational institutions (HAEIs) in different strategic regions in

the country through the establishment of a *"Professional Studies in Agriculture Entrepreneurship"* program. Farms owned by HAIEs can be transformed into a *"Technology Incubation and Agro-industrial Business Park."* A *"Business Development Service Office"* within the technology incubation and agro-industrial business park could provide much needed support.

- To develop human intellectual capital and agri-entrepreneurship in the countryside, TESDA must align and strengthen its agriculture and fisheries TVET programs and business support services, taking into consideration the peculiar needs of the rural youth.

## Introduction

Over the past several years, the Philippine agri-fishery (AF) growth has been underperforming (Briones 2021, 2023; Habito and Briones 2005; ADB 2011, 2022). Most Filipino farmers and fisherfolks remain economically poor because of low productivity (Reyes et al. 2012).

The subpar performance of Philippine AF is brought about by several conflating factors (Dy 2005; Briones and Galang 2013). Underpinning all these factors are human intellectual capital constraints in the countryside, e.g., limited technical and management expertise on economics, agronomic and weather conditions, and efficient resource allocation (Lanzona 2014). The AF sector accounts for a quarter of total national employment, but contributes only 10 percent to the country's Gross Domestic Product (GDP)—highlighting a significant gap in labor productivity.

Innovation and entrepreneurship are globally recognized as the way to revolutionize AF and increase productivity (Batalla 2010; Sungsup, Ahmed, and Teng 2019; Guelick and Bosma 2019). Since the Arroyo administration, the Philippine government has embraced entrepreneurship as a major catalyst for national economic growth. Congress has enacted several laws to promote and support innovation and entrepreneurship in all industries in the Philippines.

Agribusiness—agriculture, forestry, and fishing (AFF)—in the rural areas is hampered by the limited intellectual capital of AF entrepreneurs who are prepared to take advantage of the opportunities in the countryside. Filipino farmers and fisherfolk are an aging population with limited formal education—factors that impede innovation and investment in entrepreneurship. This is aggravated by the apparent lack of interest among the educated children of farmers to pursue agri-entrepreneurship.

As the state's instruments for education and training, higher education institutions (HEI's) contribute to economic prosperity by building the nation's human intellectual capital (Reimers and Klasen 2011; Orbeta Jr., Gonzales, and Cortes 2015; Kőmíves et al. 2019). HEIs are also mandated to develop innovative technologies and services needed to grow the national economy.

Philippine higher agriculture educational institutions (HAEIs) and the Technical Education and Skills Development Authority (TESDA) have continuously educated and trained Filipino youth and farmers to provide the human capital required for the AF industry's growth. HAEIs have also been at the forefront of AF research and development (R&D).

While the opportunities for entrepreneurship and agribusiness in the countryside are numerous, offering potentially greater economic returns, HAEIs have not adequately prepared their graduates to recognize and take advantage of such opportunities. There is a "mismatch" between the products supplied by the HAEIs, and the intellectual capital demand needed for AF entrepreneurship in the countryside.

AF graduates of most HAEIs seek employment in other sectors. This may be due to the low wages, and limited opportunities for employment and advancement in the countryside. Even among graduates of agribusiness degree programs of HAEIs who have been trained to become entrepreneurs, majority are employed in non-AF sectors.

Additionally, the capacity of HAEIs to produce innovative products and services is limited by inadequate intellectual capital, financial resources, and laboratory facilities. As a consequence, there are few appropriate "home-grown" innovations in the AF industry that positively impact AF entrepreneurship and productivity. It should be noted that R&D for innovation is a factor that directly contributes to AF productivity (World Bank 2012; Briones 2014; DTI 2018).

The aim of this research is to identify investments in the academic and R&D programs of HAEIs to strengthen their contributions towards improving Philippine AF productivity and growth.

One concern is whether or not the current bachelor curricula for agriculture and fisheries are appropriately designed. This concern also covers other related curricular programs, such as that of agribusiness and its variants, as well as TVET training programs. If not, then what curricular changes are needed to prepare graduates to recognize, exploit, and take the risks of the opportunities presented by the current agribusiness ecosystem? Moreover, this study asks:

- What programs must be put in place within HAEIs and TVET institutions to encourage and support their graduates to become agri-entrepreneurs?

- What programs must be provided by the HAEIs so that their BS Agriculture and BS Fisheries graduates will be able to take advantage of the attractive financing windows and support packages being offered by national financial institutions?

- What HAEI programs must be provided to encourage and facilitate private sector partnership and collaboration with their graduates?

- What collaborative HAEI and TVET programs should be put in place to encourage and support agri-entrepreneurship?

- How can graduates take advantage of the HAEI Technology Business Incubation programs and products in their agri-entrepreneurship ventures in the countryside?

## Philippine Agri-Fishery Growth

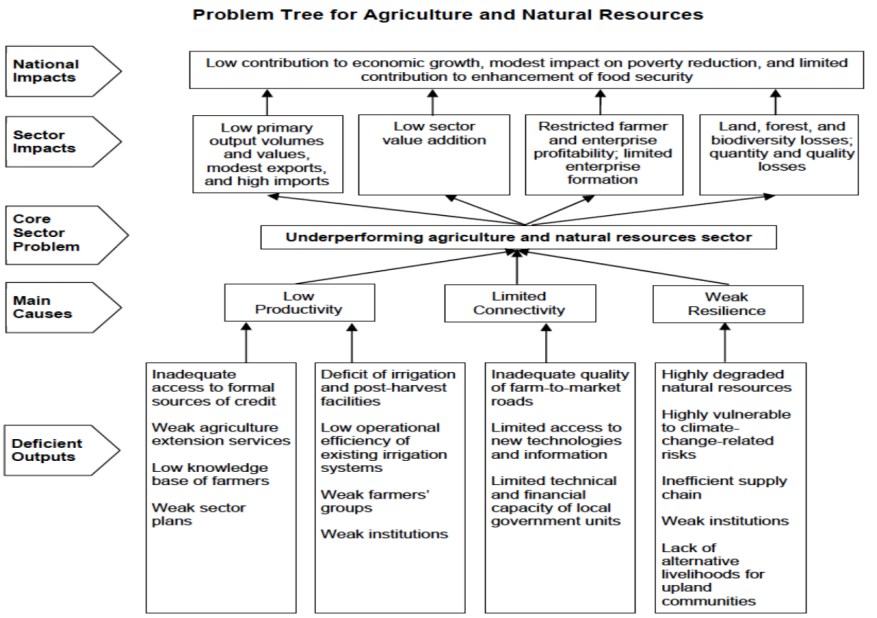
Agricultural growth in the Philippines has exhibited a boom-bust pattern (Briones 2014; OECD 2017). The Philippine agriculture sector performed well in the 1960s and 1970s, but slowed down in the 1980s; this was followed by a period of recovery in the 1990s, and acceleration in the 2000s. In the last several years, there has once again been a slowdown in growth. A number of factors contributed to the downtrend; expansion of cultivated area declined, real commodity prices dropped, and gains from the Green Revolution were exhausted (Briones 2014).

Low AF productivity and growth in the Philippines is a function of several connected factors: 1) inadequate access to formal sources of credit; 2) weak extension services; 3) low knowledge base of farmers; 4) weak sector plans; 5) insufficient irrigation and post-harvest facilities; 6) low operational efficiency of irrigation systems; 7) weak farmers groups; and 8) weak institutions. Limited connectivity and weak resilience factors (e.g., fragmented and inefficient supply chain, lack of economies of scale in farm production, and high incidence of strong typhoons aggravated by climate change) also contribute to the underperformance of the agriculture sector (ADB 2011).

Underpinning the constraints to AF productivity and growth is the intellectual capacity of the human capital. This is apparent in almost all the "deficient outputs" elements indicated in Figure 1. The importance of quality human capital in AF is further emphasized by the unique challenges of the Philippines. The country is confronted with a high occurrence of strong typhoons during the rainy months, and drought during the summer months. These natural risks are magnified by the archipelagic nature of Philippine land resources. As a consequence of these exceptionally high risks, private entities are hesitant to invest in agribusiness and entrepreneurship.

HAEIs can contribute to addressing the challenges in Philippine AF by educating and training the necessary human capital who are equipped to address the factors of "deficient outputs" in a high-risk environment (Figure 1).

**FIGURE 1. PROBLEM TREE FOR PHILIPPINE AGRICULTURE AND NATURAL RESOURCES**




Source: Asian Development Bank Country Partnership Strategy 2011: Philippines 2011-2016, Sector Assessment: Agriculture and Natural Resources.

## Intellectual Capital in Agri-Fishery in the Rural Areas

Globally, there is a declining trend in the size of the AF workforce (Ryan 2023; OECD/ADB 2017; Ryan 2023)—a trend that is also evident in the Philippines (Cerutti and Li 2021). In the 1990s, the Philippine AF labor force stood at about 40 percent of the Philippine working population; by 2020, this number went down by nearly half, with only 24.8 percent of the nation's working population coming from the AF sector (PSA 2022). As of August 2024, an estimated 9.818 million or 19.3 percent of the total national workforce was employed in the AF sector (PSA 2024a). The number of those employed in fishing and aquaculture was a little over one million in 2020-2021 (Ryan 2023).

The decline in AF workforce is evident among farmers, skilled farm workers, and tertiary graduates of AF. The number of Filipino farmers has declined from 44.1 percent (1995)

to 27 percent (2016) of the working population (Aquino et al. 2021). The situation is aggravated by the apparent lack of interest among the children of dominantly aging and under-educated farmers to engage in AF (Palis 2020; Aquino et al. 2021; Lauengco 2022).

Among the skilled workers in AF, there was a drop from 5.7 million in October 2020 to 5.6 million in October 2022 (Baclig 2022). In many farming communities in the provinces, the shortage of seasonal farm workers has been a challenge.

The decline in the number of AF tertiary graduates produced by the more than 200 HAEIs in the country is also evident; from about 22,000 graduates during the pre-covid years, this number was reduced to about 11,000 in 2020, and went further down to about 7,800 in 2022 (CHED 2024).[1][2]

Briones (2021) attributed this decline in the Philippine AF labor force to diminishing farm sizes and decreasing incomes in agriculture. The growth of the service industry sector, coupled with its more competitive wage structure, also contributed to the decline in the AF labor force. The labor force in the service sector increased from about 20 million in 2017 to 25 million in 2021 (OECD 2017), and is now estimated to be at 30 million (PSA 2024b). Wages in the AF sector have remained the lowest in comparison to those in the other sectors (Briones 2017).

While there was an increasing trend in the number Filipinos participating in TESDA AF TVET programs over the years, attendance in AF training did not translate to employment in AF jobs, nor engagement in AF ventures, despite a great majority of them being tertiary graduates who opted to remain in their provincial home area.[3] This is a clear indication of the limited agribusiness and employment opportunities in the rural areas that should have absorbed the graduates. Furthermore, this is an indication that TESDA AF TVET graduates are not equipped to recognize and take advantage of the opportunities offered by AF entrepreneurship in their rural communities.

More than the declining AF labor force, one critical trend is the very low number of graduates who are practicing their profession. In 2008 and 2015, only two percent of the AF workforce were tertiary graduates (Briones 2017).[4][5]

The employment trend highlights a "mismatch" between the educational and training preparation of AF graduates, and the intellectual capital requirements needed for AF entrepreneurship in the countryside.

Simply put, the declining trend in the AF labor force is a consequence of the limited employment opportunities and the uncompetitive wage structure of the AF industry,

which in turn is a factor of insufficient investment and limited agribusiness activities brought about by the low intellectual capital in AF entrepreneurship in AF communities.

The other "mismatch" is with the design of the educational and training programs. Greater emphasis must be placed on preparing graduates for self-employment, which calls for entrepreneurship, rather than for job-employment.[4][5][6] To grow the AF economy, there is a demand for greater agribusiness investment that is driven by the participation of private sector entrepreneurs.

## Innovation and Entrepreneurship: A National Policy for Economic Growth

The Philippine national government recognizes the crucial importance of innovation and entrepreneurship in expanding economic opportunities and growth, in developing the countryside, and in creating jobs for the dominantly young Filipino population. Entrepreneurship demands innovation to create value-added products and new markets, hence catalyzing increased agribusiness investments in the countryside.

Over the years, Congress has enacted several enabling laws mandating relevant national government agencies to integrate and mainstream innovation and entrepreneurship in their strategic plans and programs. Prominent policies include:

- RA 10644: "Go Negosyo Act" of 2014
- RA 9178: an updated revision of the 2002 "Barangay Micro-Business Enterprise Act"
- RA 9501: "Magna Carta for Micro, Small and Medium Enterprise" of 2008
- RA 10679: "Youth Entrepreneurship Act" of 2015
- RA 11337: "Innovative Startup Act" of 2018.[7]

The laws instruct national government agencies to provide resources, incentives, and support to mainstream entrepreneurship in agriculture and fisheries, as well as provide for the necessary governance mechanisms and budgetary appropriations.

As early as 1998, Executive Order 485, which established the Youth Entrepreneurship program was issued by the Office of the President and implemented by the Department of Trade and Industry (DTI). This was amended in 2005 with Executive Order 470, which aimed to "develop the entrepreneurial skills of the youth and encourage their participation in business enterprises" with components on business plan development and training; credit assistance and lending; mentoring; market syndication and linkaging; and business information network.

Meanwhile, in 2020 the Department of Agriculture (DA) launched the "Young Farmers Challenge" program in collaboration with the Office of Senator Imee R. Marcos. A bill on this program has been filed in Congress. The program offers financial grant assistance to young Filipinos eager to engage in new agri-fishery enterprises that will serve as initial capital for their intended business endeavor. Various development assistance components are also provided to the chosen winners, like coaching and mentoring, product promotion, business development assistance, and Food and Drug Administration registration (DA 2023).

In response to the national policy on innovation (RA 11337) and entrepreneurship (RA 10679), several state-owned HAEIs have established "Technology Business Incubation" programs with support from the Department of Science and Technology (DOST), DA, and DTI.[8] The initial list of participating HAEIs includes Capiz State University (CAPSU), Pampanga State Agricultural University (PSAU), Visayas State University (VSU), Mariano Marcos State University (MMSU), and Benguet State University (BSU). The following DA regional field offices are also included: Region II; Region IV-A; and Region XII; and the National Fisheries Research and Development Institute (NFRDI).

Financing is a critical element in entrepreneurship, as well as in the entrepreneurship educational programs of HAEIs and technical vocational institutions (TVIs). There are several laws and programs that provide financial resources for agri-entrepreneurship, for education and training programs of HAEIs and TVIs, and for their students and graduates, among which include:

- RA 10848: "Agriculture Competitiveness Enhancement Fund" of 2016
- RA 11901: "Agri-Agra Reform Credit Act" or better now known as the "The Agriculture, Fisheries and Rural Development Financing Enhancement Act of 2022"
- Land Bank's "Young Entrepreneurs from School to Agriculture" (YESAP) program
- Development Bank of the Philippines' "Sustainable Agribusiness Financing Program"
- DA-Agriculture Credit Policy Council's (ACPC) "Agri-Negosyo Loan Program."

Although several laws and programs on innovation and entrepreneurship have been in place for some years now, their impacts on AF growth and development have yet to be realized. In the last three decades, the country's AF performance has been sluggish, which can be attributed to the dramatic slowdown of agricultural output growth, and limited investments in agribusiness (DTI 2017).

Of the total 1.105 million micro, small, and medium enterprises (MSME) in 2022, only 0.84 percent were in agribusiness (DTI 2024).[9] Agribusiness enterprises employed only 2.29 percent of the 8.61 million Filipinos in the workforce. Furthermore, labor productivity in the AFF sector has been extremely low, as indicated by the sector's 8.6 percent (2023)

contribution to the national GDP, and the value of exports amounting to only 1.3 billion US dollars in 2023 (DTI 2017; PSA 2024). Moreover, close to 50% of the workforce remained underemployed (Briones 2017).

The AFF sector also had minimal foreign direct investments (FDI) over the last several years, unlike the services and manufacturing sectors (DTI 2017). From 2012-2014 the AFF sector received only 0.5 percent of the country's total FDI, relying mainly on the limited domestic agribusiness investments.[10]

Despite several enabling laws and national programs, there are several factors that may have contributed to the unimpressive performance of agribusiness, one of which is the limited intellectual capital in AF entrepreneurship among Filipinos in the countryside. Most notable are the low agribusiness investments in improving productivity and developing value-adding primary AF products.

## HAEIs and TESDA Programs on AF Entrepreneurship Education and Innovation

It is envisioned that AF graduates of HAEIs and TVET will take on the challenge to be the "game-changer" entrepreneurs in their respective communities. There is, however, a "mismatch" between the educational preparation of AF graduates, and the opportunities in agribusiness entrepreneurship from which the graduates can potentially generate generous incomes. The mismatch is brought about by the limited capacity of HAEIs and TESDA to prepare AF graduates on entrepreneurship. The design of AF academic programs is oriented towards employment, which in turn is influenced by the faculty profile. AF faculty have limited background and/or inadequate practical experience in agribusiness. The strength of any academic program is only as good as its faculty members (Quimbo and Sulabo 2014).

In the latest Commission on Higher Education (CHED) Program Standards and Guidelines (2021 PSG) for agriculture and fishery degrees, entrepreneurship and practical experience were recognized as important subjects for graduates; as such, several revisions in the curricula were introduced.[11][12][13] Likewise, TESDA has introduced several TVET programs on AF entrepreneurship that mainly target farmers and fisherfolk.[14]

The inclusion of introductory subjects on AF entrepreneurship in the curricula is not enough for the graduates to practice entrepreneurship.[15] Among HAEI graduates of agribusiness who had had significantly more courses on entrepreneurship, very few are self-employed entrepreneurs (Cabardo and Madamba 2014).[16][17]

Following the "Youth Entrepreneurship Development Framework" by Darisi and Watson (2017), there are five progressive stages in educating entrepreneurs—precontemplation, contemplation, exploration, activation and iteration. The HAEIs and TESDA academic and training programs would need critical interventions at the "activation" and "iteration" development stages. These are the stages where graduates practice entrepreneurship in the real world and create an impact in their community. As students progress through different learning levels, it is critical that HAEIs and TVIs provide sustained support that addresses the needs of different students.

For a young fresh graduate of an agriculture or fisheries tertiary school, engaging in agribusiness entrepreneurship is a daunting challenge. One has to do a lot of work to identify and invest in lucrative agribusiness opportunities and niches. It is a must for the entrepreneur to have a good working understanding of the local business ecosystem in the rural community. In other words, it is critical that they understand the current business supply chain landscape and dynamics, from the supply end to the demand end; they must identify key players and their business engagements, their sources of financing, and their volume of production; and they must understand, among other things, the potential market quantity and quality requirements.

The entrepreneur must also develop a social network; they must build connections with potential business partners and enablers in the local rural community, and establish their reputation among the key players in the supply chain. This phase of agribusiness entrepreneurship requires resources which may be quite limited for a young fresh graduate, more so for students from families with limited resources. The challenge is exacerbated by the fresh graduate's need to immediately generate income for themselves and their family's needs.

Thus, HAEIs and TVET institutions must improve their curricula, not only to embed and mainstream agribusiness entrepreneurship, but to provide support mechanisms and programs to facilitate engagement of their graduates in the real world of agribusiness. There is a need for a program that collaborates with the private sector who can provide professors, mentors, and resources, and more importantly, social and business contacts (Gozum 2023).

At the same time, the national government must enact policies that a) optimize the regulatory environment; b) enhance entrepreneurship education and skills development; c) facilitate technology exchange and innovation; d) improve access to finance; and e) promote awareness and networking (UNCTAD 2015).

Innovation and entrepreneurship are drivers for economic growth and job creation, while access to innovation puts the entrepreneur in a more competitive position. Product and service innovations are game-changers in agriculture that can offer new opportunities for agribusiness. These innovations can range from smart agriculture technologies that increase productivity (such as plant and soil sensors), to drone- and satellite-driven digital software applications for farm management and weather forecasting.

Some HAEIs have established technology business incubation (TBI) units with support from various government agencies. For TBIs to meaningfully contribute to agribusiness in the countryside, there is a need for sustained financial and policy support from the government that will incentivize the private sector to participate and invest in their programs.

## Policy Discussions and Recommendations

Attracting and preparing the youth for entrepreneurship requires the right supportive environment. An experiential-based educational program is in order, one that will combine adequate technical and scientific knowledge with competencies in business, particularly financial and social skills. Such programs must provide the following: a pool of successful entrepreneurs who are willing to mentor young aspiring entrepreneurs; a platform for young entrepreneurs and researchers to collaborate on the development and generation of innovative products and services; and, a business development service provider that gives guidance and advice as the young entrepreneurs explore, decide, start, and expand their respective business enterprises.

The rural youth face their own unique challenges as they transition into entrepreneurship in the countryside. They are constrained financially, and often have difficulty accessing monetary resources due to their lack of credibility and formal financial track record. Rural market opportunities are typically small-scale and limited, while a lack of business networks and experience makes larger markets and services in the city inaccessible. Furthermore, there is ambivalence on the part of outside investors to engage in high value agriculture and processing in the countryside, hence agribusiness is focused on the trade of primary produce and farm inputs. As such, there are few potential local mentors cum business partners for the young aspiring agri-entrepreneurs. The capacity of the HAEIs and TESDA to cultivate an innovation platform and provide experiential-based education and training need to be strengthened.

Lastly, business development service providers in the countryside (e.g., DTI, DOST, and local business chambers) who have long been fragmented must effectively collaborate to support the rural youth in their agribusiness engagements.

At the national level, the government must create and improve the policy, legal, and regulatory framework for deliberate and coordinated efforts by all national agencies, thus enabling collaborative work that provides the required support to educate and train young, aspiring entrepreneurs in the rural areas.

The following are concrete recommendations to accomplish the above scenario.

## *Recommendation 1 - Create a "National Agri-Entrepreneurship Council for Education & Rural Business Development"[7]*

There is a need to create a government body that will oversee, source, and provide the necessary support to educate and train the rural youth on successful agri-entrepreneurship in the countryside.

The Youth Entrepreneurship Act called for the creation of an Entrepreneurship Education Committee (EEC) to be Chaired by the Secretary of Education. One of its duties is to formulate a national education strategic plan for the country. Currently, there is a need for a unified and strong effort to push for agri-entrepreneurship in the rural areas. There are several on-going national entrepreneurship programs by various national agencies (DTI-YEP, DA-YFC, TESDA). A functional coordination mechanism among these agencies must be established; in doing so, limited resources can be efficiently allocated, and lessons can be shared for greater outcomes and impact in the countryside.

The duties and tasks of the proposed council will be as follows:

- Conduct in-depth research to understand the educational and training needs of the target young agri-entrepreneurs, and the appropriate learning approaches and methodologies;

- Conduct in-depth research to determine the support resources of the target young agri-entrepreneurs in their actual practice of agribusiness in their respective rural communities;

- Conduct in-depth research to ascertain the performance of existing HAEI and TVI programs toward the identification of effective interface/collaborative activities;

- Formulate a strategic educational-training and practice plan;
- Formulate the appropriate governance structure and organization for a unified program of HAEIs and TVIs, with the active participation of the private sector; and,
- Determine and source the required resources to implement the program.

### *Recommendation 2 – Capacitate and strengthen selected HAEIs in different strategic regions in the country, specifically on the following areas:*

- Institution of "Professional Studies in Agriculture Entrepreneurship"

A new two-year degree full-scholarship post-graduate program on practice-oriented agriculture entrepreneurship is needed. This will be offered for select graduates of BS Agriculture and BS Fisheries showing strong interest and commitment to be entrepreneurs. TESDA graduates of agriculture and fisheries training courses who are college degree holders may be also eligible to the program.

The first half of the enterprise-based training (EBT) component shall be for the development of a business plan while working with a practicing mentor. The second year will be devoted to the initiation of the actual business. In this regard, the program should be implemented in collaboration with the local Department of Trade and Industry, and with the local business chamber of commerce and industry (e.g., PCCI). Scholarship funds may potentially be sourced from the available windows, such as the DA, DTI, CHED, TESDA, and the Agricultural Competitiveness Enhancement Fund .

An educational program is only as good as its faculty. Most HAIEs' faculty members are highly educated, but their education and experience may not cover actual business practicality. A quick remedy to address this limitation would be to affiliate practicing entrepreneurs as faculty members and mentors to co-teach relevant courses. With the strong capabilities of digital interconnectivity, classes can be done virtually. Hence, it is critical for HAEIs to invest heavily in their digital interconnectivity capabilities.

A package of incentives must be put in place to entice the practicing entrepreneurs to share their experiences and resources. As part and parcel of faculty development, a consortium of HAEIs and TVETs offering the programs can be established, which shall facilitate sharing of experiences and lessons learned.

HAEIs must explore partnerships with private entities that have programs on field-based agriculture entrepreneurship (e.g., Jollibee Group Foundation Inc. and Gawad Kalinga).[18]

- Transformation of HAEIs' Farm into a Technology Incubation and Agro-Industrial Business Park

Some state-owned HAEIs have established TBIs with funding and other support from DOST, DA and DTI. The DA-BAR has the Agri-fisheries Technology Business Incubation (TBI) Program focused on empowering and strengthening the capacities of research for development-based incubators so they can extend the necessary support, guidance, and mentorship to incubatees, who seek to establish agri-fishery technology-based enterprises (DA-BAR, n.d.). This is in line with the Innovation Act as well as the Youth Entrepreneurship Act. Through the TBIs, incubatees are provided with technical assistance, physical resources, business management services, and access to available mature technologies during the pre-, actual, and post-incubation process (DA-BAR, n.d.). The initial list of participating HAEIs include Capiz State University (CAPSU), Pampanga State Agricultural University (PSAU), Visayas State University (VSU), Mariano Marcos State University (MMSU), and Benguet State University (BSU). Also included are DA regional field offices (Region II, Region IV-A, and Region XII), and the National Fisheries Research and Development Institute (NFRDI).

The technology business incubation program of the HAEIs can be the nucleus for the creation of a "Knowledge, Innovation, Science and Technology (KIST) Park and Agro-Industrial Processing Zone," envisioned by the Philippine Export Processing Zone to be established in strategic areas in the country. With the sizable land grants of HAEIs, the property can be used as agro-industrial business parks to serve their respective regions, similar to those created by the Catanduanes State University, the Batangas State University and the University of Philippines Los Baños (Presidential Proclamation No.1164 and 1165; S-2015). These are special economic zones for agro-industrial parks.[19]

The TBI-KIST can be not only a learning laboratory of the entrepreneurship courses, but also a venue for graduates to develop and evaluate innovative products, and translate them into viable business enterprises. More importantly, the facilities and services provided in the agro-industrial business can be strong incentives for the private sector to invest in the area.

- Establishment of a Business Development Service Office (in partnership with DTI "Negosyo Centers") within the Technology Incubation and Agro-Industrial Business Park

A support mechanism for graduates engaging in agribusiness is critical. It is proposed that HAEIs establish a dedicated business support office for their graduates. This office will provide coordination, facilitation, and monitoring services that can match graduates

with practicing mentors, provide information, and facilitate access to credit, technologies, market, and suppliers. The office will also provide support in developing a social and business network for the graduates with practitioners and relevant government offices. Likewise, these services should be available to private sector locators.

The office should have the following responsibilities:

- Assist graduates/locators in identifying and developing relationships with business enterprises, mentors, and life coaches.
- Assist graduates/locators in building a social and business network.
- Assist graduates/locators in accessing financial assistance and personal bridge funds.
- Assist graduates/locators in accessing the services of technology innovation business incubation centers found in HAEIs and other agencies.
- Assist graduates/locators on business legal matters.
- Assist graduates/locators in partnering with farmers.
- Assist students in finding and matching with business partners.
- Monitor and document progress of graduates and business ventures.

It can be a challenge to find and develop relationships with private sector partners who can stand as educational collaborators and business locators. Thus, the HAEIs and TVIs must have staff of qualified to handle the above tasks.(17)

### *Recommendation 3 – Capacitate TESDA to align and improve its agriculture and fisheries TVET programs towards developing human intellectual capital for agriculture entrepreneurship in the countryside by:*

- Strengthening and expanding partnership with private entities that have a proven track record of training the youth on agriculture entrepreneurship, such as the Gawad Kalinga and Jollibee Group Foundation Inc.(18)

- Improving collaboration with HAEIs on agriculture innovation and entrepreneurship; consider the "Professional Studies in Agriculture Entrepreneurship" program and the "Technology Innovation and Business Incubation" program of the selected HAEIs as a key training pathway for participants with tertiary education.(19)

## Conclusion

The low agriculture and fisheries productivity in the Philippines can be attributed to limited entrepreneurial agribusiness, which is a function of the human intellectual capital in agri-entrepreneurship present in the countryside. There is a "mismatch" between the education and training of HAEI and TVI graduates, and the skills needed to recognize, exploit, and benefit from the agribusiness opportunities in rural communities.

The rural youth have limited financial and social resources. Thus, there is a need to develop easily accessible credits, improve access to distant larger markets, and address the urgency for them to immediately generate income for daily subsistence. Appropriate education and training programs, together with business support services, must be crafted by HEIs and TVIs to support and guide the rural youth to actually practice entrepreneurship in the countryside. The program must include an enterprise-based training component, and private sector mentoring component.

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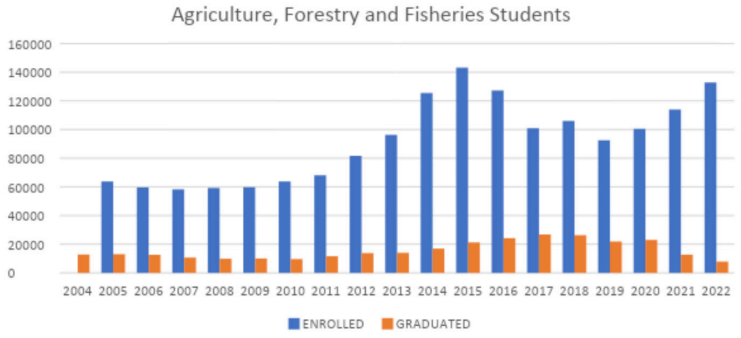
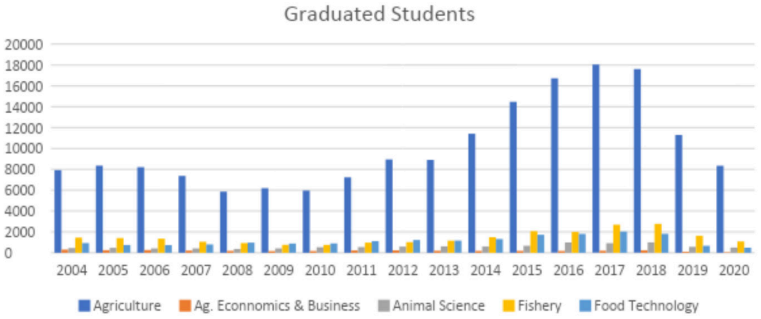
## Endnotes

1 Figure 2. Tertiary student enrolment and graduates in agriculture, fishery and forestry, 2004-2022 (no data on enrolment for 2004) (CHED 2024).




2 Figure 3. Tertiary students graduated in selected fields of studies in agriculture and fishery, 2004-2020 (no data on graduates of agriculture for 2020) (CHED 2024).




3 Table 1. Employment of AFF TVET graduates at time of interview, and occupation before and after training. Note: About 45 percent of TVET AFF participants have tertiary degrees. (Study on the Employment TVET Graduates; from TESDA raw data set.)

| | | PERCENT EMPLOYED AT TIME OF INTERVIEW | | PERCENT OF AFF PARTICIPANTS' WITH OCCUPATION IN AFF | |
|---|---|---|---|---|---|
| Year | AFF Survey Respondents (Total) | Employed (AFF + Others) | Employed (AFF Only) | Before Training | After Training |
| 2018 | 171 | 54.38 | 11.69 | 15.78 | 13.45 |
| 2019 | 327 | 57.49 | 15.29 | 13.76 | 12.84 |
| 2020 | 436 | 39.44 | 20.41 | 16.74 | 16.28 |
| 2021 | 1382 | 62.87 | 33.71 | 33.57 | 32.63 |
| 2022 | 1340 | 48.13 | 33.28 | 17.08 | 17.08 |

4 The employment-oriented focus of AF HAEI academic programs is evident in the reports of Smith et al. (1988) and JICA (2015). They observed that the learning experiences of HAEIs students were dominantly classroom-based, with inadequate teaching equipment and basic laboratory instruments, and that there was a mismatch in the skills and competencies of graduates with those that employers need.

5 In several reported AF graduate tracer studies (Cerutti and Li 2021; Centillas 2019; Dusaran 2008; Bayed et al. 2021; Yanos and Espinosa 2022; Tacbalan 2022; Garcia 2022; Ceniza et al. 2022; Tria and Bocacao 2022; Tutor, Orbeta Jr., and Miraflor 2019; Domingo 2013), about 80 percent of AF tertiary graduates were employed at the time of the survey, but less than 40 percent were employed in AF-related jobs; and, of this, a greater majority were employed as skilled workers rather than professionals.

6 Even among agribusiness/entrepreneurship graduates of HAEIs, employment has been the career track. It is interesting and revealing that even among BS Agribusiness and Management graduates who were educated, and were expected to be entrepreneurs, very few went into entrepreneurship. In the study by Cabardo and Madamba (2017), among graduates of BS Agribusiness from UP Los Banos (n=150), majority of the graduates were employed in various capacities, and only 3 percent of the graduates were entrepreneurs.

7 Senate Bill No. 2090 and House Bill 6473 calls for the creation of an "Entrepreneurs Academy". Section 3 of House Bill 6473 states that "the Academy shall provide undergraduate and graduate degree programs, short-term technical-vocational non-degree courses, and modular training that will enhance the core competencies of individuals on entrepreneurship. It shall cater to technical-vocational, college, and graduate students. It shall promote the relevance of entrepreneurship to job generation and its significant role in the sustainable economic growth of the country."

Meanwhile, section 4 of the same house bill mandates that "the Academy shall offer undergraduate and graduate degree programs and short-term diploma or certificate courses on entrepreneurship, including entrepreneurship development in the fields of agriculture, trade, technology, and the manufacturing sector. The curricula and modules of the programs shall be designed and developed following the competency-based curriculum model and in accordance with the mandate of this Act".

8 DOST and DTI have existing programs to promote innovation and entrepreneurship in the country. DOST's "Technology Business Incubation" program provides

resources, support services, and facilities for start-up technology-based enterprises. These include technical assistance, intellectual property management and legal counseling, business development and marketing assistance, analytical laboratory services, and administrative services (DOST-PCIEERD 2014). DTI's "Technology Entrepreneurship Acceleration" program focuses on commercializing innovative ideas and products of Philippine-based enterprises in the global market. The program aims to make products and services of small and medium enterprises globally competitive by providing support to improve the pool of human resources in the country particularly in innovation R&D of universities through cross-border training and mentoring, and in the commercialization of their products in the global market (DTI n.d.-b.).

9 MSMEs make up 99.59 percent of business establishments in the Philippines, 90.49 percent of which are micro-enterprises (DTI n.d.-a). While the total number of AF establishments increased by 10 percent from 2021 (2,896) to 2022 (3,187), the total estimated revenue decreased by 4.3 percent (PSA 2024b). Of the total number of AF establishments in 2022, 49.3 percent were engaged in animal production, 24.6 percent in crop production, and only 6.3 percent in aquaculture. In terms of employment, in 2022 82,258 were employed in the crop production subsector, and only 39,481 were employed in the animal production subsector.

10 While processed foods and beverages have had impressive growth over the years constituting 50 percent of the manufacturing sector, processed materials are made from imported primary AF products, such cereals, rather than the processing of domestic AF primary produce (OECD 2017).

11 The 2021 CHED PSG for Fisheries introduced the following areas in the curriculum: a) fisheries entrepreneurship; b) project development and management; c) GIS and remote sensing for fisheries; and d) special problem course or on-the-job training.

12 The salient revisions in the latest agriculture curriculum include the addition of: a) a 3-unit course (240hr) for outside campus apprenticeship in an agriculture industry or enterprise, in which a business plan or action plan is the expected output from the students; b) a 3-unit practicum course skills development; c) a 3-unit course on agricultural policy and development; and d) a 3-unit course on agriculture entrepreneurship and enterprise development.

13 The Diploma in Agricultural Technology ladder to Bachelor in Agricultural Technology (DAT-BAT) program is differentiated from BS Agriculture in that the program is skills- and practical-oriented, focusing on the technologies of

production. Included in the program are three courses on entrepreneurship, namely: a) Fundamentals of Entrepreneurship; b) The Entrepreneurial Mind; and 3) Farm Business Management. These three courses, however, may not cover the needed exposure to learn and practice entrepreneurship. Similar to the BS Agriculture and BS Fisheries, it may be difficult to increase the number of subjects on entrepreneurship without compromising the technical content of the curriculum.

14 TVET NC-II entrepreneurship program is offered by TESDA. It is open to all ages, educational backgrounds, and sectors. It is composed of the following modules: a) introduction to entrepreneurship; b) assessing market opportunities; c) establishing the farm production plan; d) handling finances; and e) marketing farm produce. Upon completion of the modules, graduates qualify for a production coordinator or production manager position. A business development service program for graduates is not included.

15 In a survey conducted by Manigo (2021) among selected government-owned HAEIs tertiary students from Region XI, it is interesting to note that a great majority of the respondents indicated their desire and interest to engage in entrepreneurship in agriculture. This, however, has not translated into agribusiness practice. In tracer studies conducted by various HAEIs on their agriculture and fisheries graduates, only about 3 percent are in agribusiness.

16 Among the ASEAN countries, Filipino youth in general have the highest regard for entrepreneurs; they have the strongest entrepreneurial intentions, perceptions of personal capabilities and market opportunities, with the lowest fear of failure in business ventures (Velasco et al. 2016). The Filipino youth thus have the highest rate of new business formation in the ASEAN region, and the second highest rate of early-stage entrepreneurship. However, the highest rate of business discontinuance is also among Filipino young entrepreneurs; the reasons provided by the respondents were low profitability, depletion of capital, and personal emergencies. While the study had respondents who were not localized to agri-entrepreneurs, the trend may very well be reflective of the Filipino youth's engagement in agribusiness.

17 Generalao et al. (2024) reported that "despite the abundance of financial and non-financial incentives, existing mechanisms have not been effective in attracting private actors, including firms/enterprises and technical vocational institutions," to participate in enterprise-based training programs; other factors identified include "limited capacity of implementers, unresponsiveness of training programs, and intersectoral and interagency coordination concerns."

18 Alternative learning models in agriculture entrepreneurship were practiced by a number of private entities such as the "Family Farm Schools" approach by Pampamilya Paaralang Agrikultura, Inc. and the Management Association of the Philippines, modified by Pilipinas Shell Foundation Inc. in its "Sanayan ng Kakayahang Agrikultura" (SAKA); the "Farm Business Schools" of the Meralco Foundation Inc.; "The Social Enterprise Model" of Gawad Kalinga; and Jollibee Group Foundation's "Farmer Entrepreneurship Program" (FEP). The last two have strong components in value-adding and marketing in their program. TESDA has limited partnership with some of these private entities as training venues for their AF TVET participants.

19 ADB recently approved a $100 million loan to upgrade and modernize the Philippines' TVET ecosystem. The program aims to transform seventeen selected technology institutions nationwide into industry-responsive innovation centers (ADB 2022 as cited by Generalao et al. 2024).

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