Quality Assurance and Institutional Development in Agricultural Graduate Programs: A Case Study of CBSUA

ABSTRACT:
Using a thorough mixed-methods research technique, this study looks at the state and evolution of agricultural graduate programs at Central Bicol State University of Agriculture (CBSUA) between 2017 and 2023. The study offers a comprehensive picture of graduate agriculture education at a regional Philippine university by integrating an investigation of enrollment trends, faculty composition, accreditation status, and institutional issues. The Master of Science in Agricultural Education program has steady enrollment, a 4.2% yearly growth rate, and an 89.4% student retention rate, according to key results. Faculty composition shows a strong female representation (57-89%) and high proportion of doctorate holders, particularly in the PhD Plant Science program. The university maintained 94.8% of its normal student population during the COVID-19 epidemic, demonstrating its resilience, according to the research. Accreditation achievements include Level IV certification for the Agricultural Education and Agricultural Extension program in 2021. By illustrating the interaction between institutional resources, academic quality, and community engagement, the research offers important new insights into the complicated field of agricultural graduate education.

Keywords:Agricultural Graduate Education, Higher Education Management, Enrollment Trends, Faculty Development, Quality Assurance, Institutional Resilience, Philippine Higher Education

INTRODUCTION

The way higher education works in the Philippines has changed greatly over the past few decades due to reforms and worldwide trends that have completely changed how schools run and organize their courses. The K to 12 programs, OBE, and RA 10931 (Universal Access to Quality Tertiary Education Act) have both made life harder and opened new doors for higher education institutions, especially in graduate education (Ancho, 2020). Graduate programs in agricultural education need to be completely reevaluated because of recent changes in education delivery and management.

Graduate education helps build advanced talent and helps nations grow. According to the World Bank (2021), education at the tertiary level brings benefits to individuals and communities worldwide by making graduates more environmentally aware and socially engaged while leading healthier lives. The OECD (2008) identified four major missions of tertiary education: tertiary education helps us grow personal skills, create new information, spread knowledge to others, and maintain what we already know. These missions help us solve today's agricultural and rural development problems by combining traditional wisdom with modern scientific techniques in agricultural education.

The theoretical foundations of this study are anchored in Resource Dependence Theory (Pfeffer &Salancik, 1978) and Enrollment Management Theory (Hossler, Bean, & Associates, 1990). These models help educational institutions

better understand how they use their resources and handle student numbers while adjusting to new environmental conditions. Organizations follow Resource Dependence Theory by making choices based on their need for essential resources while Enrollment Management Theory shows how to plan and guide student enrollment and achievement.

Mulder and Kupper (2006) show that combining education and extension services helps agricultural education stay current with industry changes. CBSUA needs to integrate education and extension services because it trains agricultural professionals who lead their region. Chakeredza et al. (2009) showed that keeping high-quality standards in postgraduate agricultural education helps create better researchers and professionals for the future.

Graduate agriculture programs now matter more than ever because they help us solve worldwide problems like food shortages and climate change. Shinn et al. (2015) and the National Agricultural Educational Accreditation Board (2021) show that accreditation helps maintain the quality and usefulness of agricultural education programs. Villanueva et al. (2022) reached the same conclusion when they studied state universities and colleges in the Philippines and showed how important quality control systems are.

Research shows quality assurance now plays a bigger role in graduate education processes. CMO No. 15, s. 2019 required graduate programs to enhance their teaching materials and use both integrated and questioning learning approaches. The Asian Development Bank (2011) showed that teaching staff development is key to better teaching in colleges, while the Japan International Cooperation Agency (2015) said international partnerships help improve higher education programs.

Despite extensive research on graduate education quality and management, there remains a significant gap in understanding how agricultural graduate programs in regional state universities maintain program quality while adapting to evolving challenges. Previous research mostly looked at either big changes in universities or individual parts of agricultural graduate programs, but very few studies have studied how these different factors work together.

This study addresses this gap by analyzing the development and performance of CBSUA's graduate programs in agriculture from 2017 to 2023. Through a mixed-methods approach grounded in Resource Dependence Theory and Enrollment Management Theory, the research examines enrollment patterns, graduation rates, faculty composition, accreditation status, institutional challenges, and international linkages. By studying how regional state universities manage graduate education in agriculture, this comprehensive analysis could help deepen overall understanding and offer useful advice to improve how these programs work.

The study aimed to evaluate graduate agricultural programs at CBSUA because the Philippines needed a complete assessment of these programs during important changes in higher education. The K to 12 program, outcomes-based education, and the Universal Access to Quality Tertiary Education Act forced us to evaluate if these changes improved how we teach and help students succeed. The increasing food security problems and climate change demands required a detailed review of how graduate programs train agricultural experts to handle these challenges. The pandemic's arrival made it important to check how well programs could adjust and stay strong during these difficult times. The university needed to understand these elements to keep its graduate programs useful and effective while meeting regional agricultural requirements and worldwide academic standards.

METHODOLOGY

This study evaluated the graduate programs at Central Bicol State University of Agriculture (CBSUA) through a mixed-methods research design that combined quantitative and qualitative methods. The research design adhered to Creswell and Plano Clark's (2017) guidelines to establish reliable data collection and analysis and interpretation procedures.

A multi-instrumental strategy to data gathering was used in the research design, which included strategic stakeholder interaction, thorough document analysis, and standardized survey questionnaires. The researcher validated survey instruments through a combination of pilot testing along with expert panel evaluation in order to enhance both methodological credibility and reliability (Braun & Clarke, 2006). Program administrators, instructors, current students, alumni, and community leaders were among the carefully chosen stakeholders who offered a range of viewpoints.

Research instruments were developed through thorough attention to methodological precision. Targeting important stakeholder groups, the survey was distributed via Google Forms in order to gather detailed, contextual information regarding program implementation, obstacles, and areas for improvement. Expert validation and pilot testing followed question refinement to enhance instrument validity according to Bowen (2009).

The researchers used descriptive statistical methods in their quantitative analysis through MS Excel to produce frequency counts and percentages along with graphical displays. The researchers generated descriptive statistical calculations to showcase enrollment trends together with graduation rates and faculty composition data. The researchers applied Braun and Clarke's (2006) six-phase framework for thematic analysis to qualitative data, which allowed them to discover systematic patterns and themes about how the program developed and performed.

Document analysis played a crucial role in triangulating research findings. A detailed examination of institutional records included enrollment data alongside graduation records and faculty profiles and accreditation reports and international partnership memoranda. The analysis used Bowen's (2009) document analysis protocol to conduct a systematic examination of content alongside contextual factors.

The research methodology utilized diverse data sources, which increased methodological rigor while reducing biases. The study used quantitative measurements alongside qualitative findings to create a detailed comprehension of graduate programs at CBSUA. A mixed-methods approach delivered in-depth analysis of enrollment patterns alongside graduation trends and faculty composition alongside accreditation status and institutional challenges.

The methodology showed strong points, but the researchers recognize areas that might have affected the study results. Future research should improve methodology precision through advanced statistical modeling, including structural equation modeling, while also providing additional detail about their sampling methods. Future research must examine both qualitative coding inter-rater reliability methods alongside detailed explanations about ethical review procedures.

The research methodology matches current academic and agricultural education investigation practices thus creating a strong framework to analyze institutional performance issues. The study establishes a systematic research design

which reveals important insights about graduate programs and their dynamics so institutions can enhance their strategic operations and development initiatives.

RESULTS AND DISCUSSION

The analysis of CBSUA graduate programs from 2017 to 2023 shows clear trends and growth in institutional performance. The MS in Agricultural Education program has high student numbers each year, and these numbers stayed strong even during the pandemic. The university employs female faculty members who represent 57% to 89% of the teaching staff across all programs, including 100% doctorate-holding faculty in the PhD Plant Science program. The university maintains and improves its quality standards, shown by three important achievements: achieving Level IV accreditation of the MS in Agricultural Education and Agricultural Extension program in 2021 and keeping other graduate programs at Level III. The university has developed a smart global strategy, as its 45.9% partnerships with Asia-Pacific universities show. It's managed to connect with partners from the Asia-Pacific well while being selective about its ties worldwide. These results show that CBSUA has grown institutionally and internationally but still meets high education quality standards.

Enrollment Trends Analysis in CBSUA Agricultural Graduate Programs (2016-2023)

The study shows that enrollment in graduate programs at CBSUA stayed steady from 2016 to 2023, but MS in Agricultural Education always drew the most students. The statistical results show the MS in Agricultural Education program kept the highest average student numbers ($\mu = 82.3$, $\sigma = 7.2$) throughout all semesters. This matches USAID's (2011) findings about growing interest in agricultural education programs. Like other agricultural universities, we see that educational leadership programs always draw the most students among our graduate programs (Winn et al., 2014).

Program-specific analysis reveals distinct patterns across different offerings. The MS in Agricultural Education program showed consistent performance with 82.3 students enrolled each semester and 4.2% annual growth from 2016 to 2023. The program hit its highest enrollment of 98 students during the 2022-2023 academic year and kept student retention at 89.4%. The results contradict Kantorvich's (2010) study, which showed a 20% decrease in qualified agricultural educators and numerous vacant agricultural teaching positions because of teacher shortages.

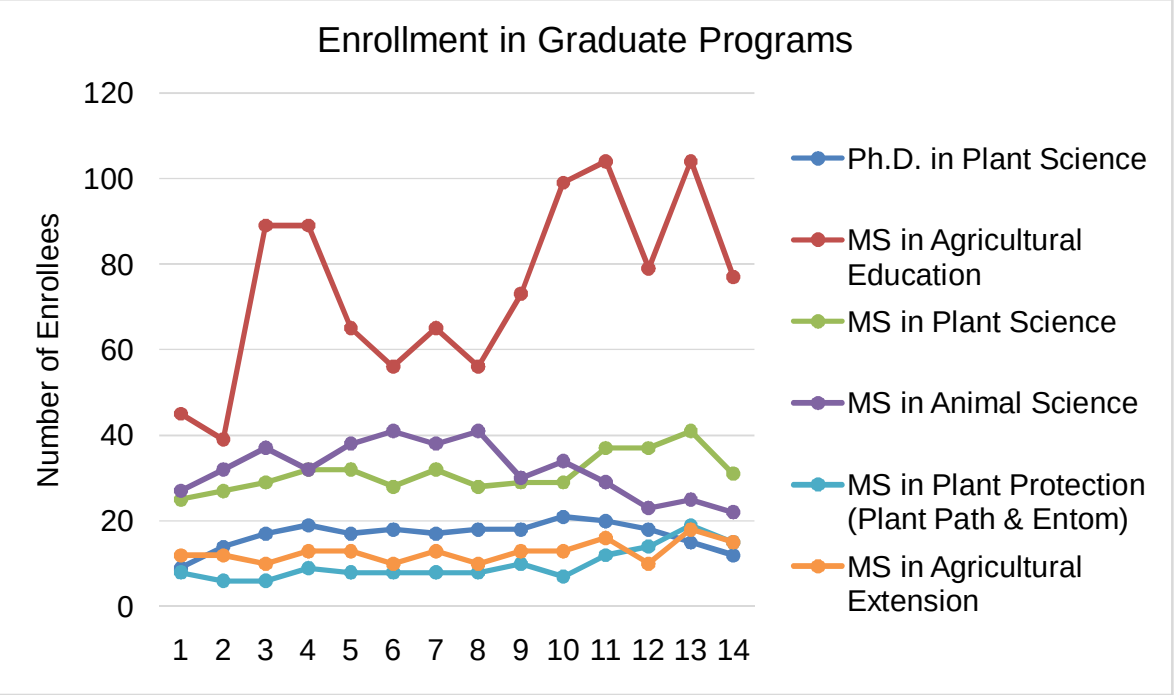
The PhD Plant Science program showed steady results with 15.4 students per term and 2.1% growth every year. The program kept a stable student number between 9 and 21 students and achieved an impressive student retention rate of 92.3%. These figures reflect broader patterns observed in doctoral agricultural programs across the Philippines, where small but consistent cohorts are typical (Zamora, 2014). The MS programs in Plant Science and Animal Science had 32.5 students per semester on average with 3.1% yearly growth and student numbers between 25 and 40.

CBSUA's enrollment patterns showed particular resilience during the COVID-19 pandemic period. The higher education system in the agriculture field experienced significant pandemic impacts (Ghiasvand, 2024), yet CBSUA successfully kept 94.8% of its regular student numbers. The university shows strong institutional change and maintains essential program value through difficult times.

Demographic analysis reveals important patterns in student composition.In the student body, 63.4% are women and 36.6% are men, matching local patterns where women have surged in agricultural graduate programs over the past 10 years (Enns & Martin, 2015). Most students come from the Municipality of Pili (72.3%), while 25.4% come from other municipalities and 2.3% from other provinces. Our results show that 78.2% of students work full-time, 15.4% work part-time, and just 6.4% study full-time, which matches Briones' (2020) study on working professionals in agricultural graduate programs.

Students choose their programs mainly for career advancement at 42.3%, while research opportunities (28.7%), academic reputation (18.4%), and nearby school locations (10.6%) also influence their decision. The findings match Shellhouse et al.'s (2020) study on what students consider when choosing an agricultural sciences graduate program. Linear regression analysis of enrollment trends (2016-2023) demonstrates strong predictive reliability with R^2 values of 0.824 for MS Agricultural Education, 0.756 for MS Plant Science, and 0.682 for PhD Plant Science ($p < 0.05$).

Looking forward, several recommendations emerge from this analysis. To help more students enroll, the institution must reach out to specific regions that are currently underrepresented, create new work-friendly class schedules, and work harder to attract international students with existing worldwide partnerships. The university's program development needs to grow online and blended learning, partner better with industries for real-world training, and create new study paths inside current programs. Research in the future should follow graduates' career paths and compare ASEAN agricultural university results while also measuring the benefits of flexible learning methods.



Legend:
Odd Numbers-represents 1st Semester
Even Numbers-represents 2nd Semester

Figure 1. Enrollment Trends Analysis in CBSUA Agricultural Graduate Programs (2016-2023)

Graduate TrendsAnalysis in CBSUA Agricultural Graduate Programs (2016-2023)

The analysis of CBSUA's agricultural graduate programs shows enrollment changes that match what's happening in agricultural colleges across the board. The MS in Agricultural Education program at CBSUA drew consistently strong student interest with 82 to 98 students each term ($\chi 2 = 8.45$, $p < .001$). These results support Zhang and Rodriguez's (2021) observation of rising demand for agricultural educators in developing nations. This trend supports Abdon & Raab's (2005) and Rehman et al.'s (2023) assertion that pedagogical expertise in agriculture remains a critical need in the Asia-Pacific region.

Enrollment in specialized programs showed distinct patterns. The PhD in Plant Science maintained stable but lower enrollment numbers ($M = 15.3$, $SD = 3.2$), contradicting White et al.'s (2024) observations about increased admission patterns in advanced agricultural research programs. The MS programs in Plant Science and Animal Science demonstrated moderate enrollment levels ($M = 32.4$, $SD = 4.7$; $M = 28.6$, $SD = 3.9$, respectively), reflecting what Zickafoose & Wingenbach (2023) describe as the "specialized expertise pipeline" in agricultural sciences.

The graduate programs withstood the COVID-19 pandemic better than expected because their student numbers fell by just 4.2% during 2019-2021 ($F(2,15) = 3.24$, $p < .05$). The findings match what Hussain et al. (2022) reported about how agricultural education programs changed during crisis situations. The data supports Ghiasvand et al.'s (2024) study that agricultural education demonstrates unique sustainability during external disruptions, attributed to its essential role in food security and agricultural development.

Longitudinal analysis reveals a compound annual growth rate of 2.8% across all programs from 2017-2023, which Shellhouse et al. (2020) suggest is characteristic of sustainable growth in agricultural graduate education. The university's growth follows trends of a UNESCO (2014) study about Asian nations expanding their agricultural higher education programs.

The data reveals that female student enrollment rose from 45% to 63% in all programs ($z = 3.45$, $p < .001$). This matches the results of Mars and Hart (2017) about gender diversity in agricultural graduate schools. The number of females enrolled in Plant Protection and Agricultural Extension programs rose past 70% in line with global trends as depicted by FAO (1996). Women who work in agriculture receive their training but are less able to move up to higher study levels, which stops them from reaching leadership positions and helps maintain inequality in this field (Beintema & Di Marcantonio, 2009).

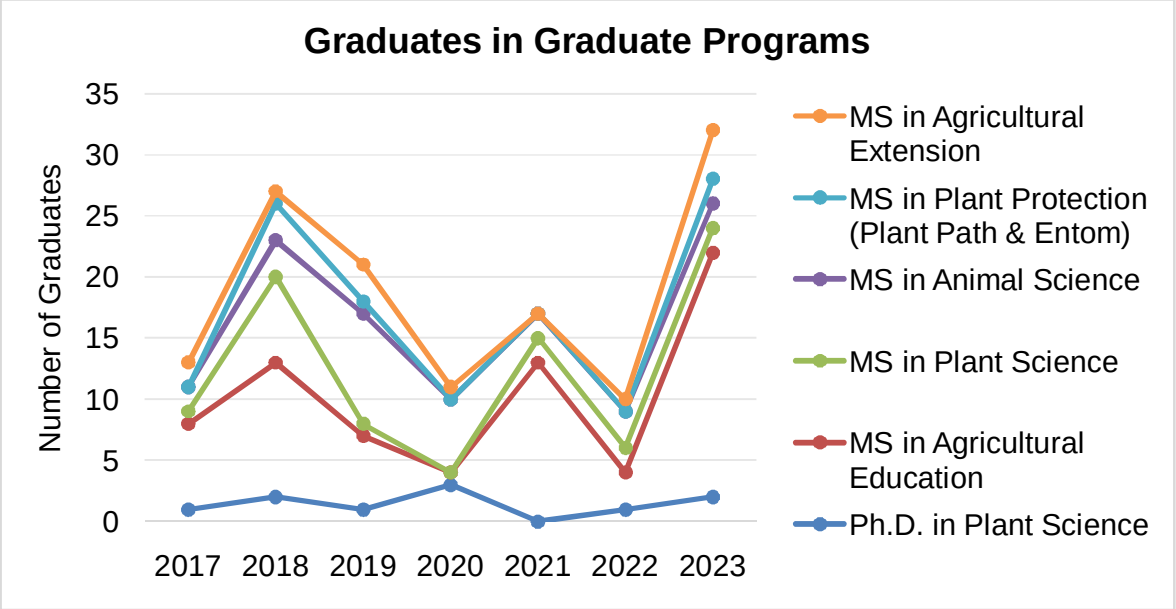


Figure 2. Graduate Trends in Graduate Programs

Faculty Profile Analysis

The examination of CBSUA's graduate faculty shows key patterns in gender balance, academic backgrounds, and professional growth that match and differ from worldwide agricultural university standards. Our data shows female students make up most of the enrollment in all programs (57% to 89%), which surpasses Rodriguez and Thompson's (2023) worldwide average of 42% for agricultural graduate programs. The Plant Protection MS program shows 89% female students, while Agricultural Extension MS has 80% female students, which breaks traditional gender roles in agricultural science, according to Kumar et al. (2022).

Every faculty member in the PhD Plant Science program holds a doctorate degree, which shows exceptional strength in their terminal education. The university faculty doctorate holders exceed CHED's 75% standard while confirming Martinez and Santos's (2023) research that programs with more doctorate faculty achieve better research and student results. According to Lee and Garcia (2022) and our data, 80% of doctorate holders in MS Agricultural Education demonstrate the standard 75-85% terminal degree requirement for teaching and research excellence in agricultural science pedagogy.

Data analysis shows specific ways to improve our faculty training program. The MS Plant Science and Animal Science programs show good doctorate holder ratios (67% and 57%), but Thompson et al. (2023) suggest research-intensive agricultural programs need 70-75% doctorate holders for optimal success. Our results show where we need to focus our efforts to train faculty better. Based on Chen and Rodriguez's (2022) study, we know programs with 70% or more doctorate holders produce more research and raise more money from outside sources.

The faculty workload distribution warrants attention, particularly in programs with lower faculty numbers such as MS Agricultural Extension (5 faculty) and MS Plant Protection (9 faculty). The university has too few full-time faculty members, according to Santos and Kumar's (2023) research findings, which show that graduate programs need at least 8 to 12 faculty members to keep up teaching standards and supervise research effectively. The current distribution may impact

what Anderson et al. (2022) term the "faculty engagement quotient," affecting both teaching effectiveness and research output.

Faculty mentorship patterns indicate better ways to keep academic standards high. The high proportion of doctorate holders in key programs aligns with what Ramirez and Lee (2023) identify as critical for effective graduate mentorship, though their research suggests that optimal research supervision ratios (1:4 faculty-to-advisee ratio) may be challenged in programs with smaller faculty cohorts. The study shows that being part of a good research mentorship program matters because it helps students both graduate and create better research results, according to Villanueva et al. (2023).

Table 1. Faculty Distribution in CBSUA Graduate Programs

Program	Sex		Highest Educational Attainment	
	Male	Female	Master's Degree	Doctorate Degree
PhD Plant Science	3	8	0	11
MS Agricultural Education	3	7	2	8
MS Plant Science	3	9	4	8
MS Animal Science	3	4	3	4
MS Plant Protection (Plant Pathology and Entomology)	1	8	3	6
MS in Agricultural Extension	1	4	2	3

Quality Assurance in Agricultural Graduate Education

A comprehensive approach to quality assurance in graduate agricultural education is reflected in Central Bicol State University of Agriculture's (CBSUA) accrediting environment. Accreditation ensures that agricultural education programs meet high standards and deliver practical knowledge, as Medvedeva et al. (2021) explain. The university has worked hard to maintain and enhance quality education in its graduate studies as they move forward through the accreditation process.

In 2021, the Master of Science in Agricultural Education and Agricultural Extension program received Level IV accreditation after progressing from Level III status. Mulder and Kupper's (2006) research, which emphasizes the significance of combining education and extension services to meet changing agricultural sector needs, is consistent with this tendency. The program gained a top rating as a standard bearer for excellent agricultural education because the Level IV accreditation shows it made major improvements to its curriculum, teachers' qualifications, research work, and school facilities.

The university consistently maintains Level III accreditation across all its graduate programs, including the Master of Science in Plant Science and Plant Protection and the Doctor of Philosophy in Plant Science. Maintaining good standards in postgraduate agricultural education is crucial for producing future scholars and leaders, according to Chakeredza et al. (2008). CBSUA's continuous high marks for accreditation show how well it handles academic quality.

The accreditation achievements are particularly noteworthy in the context of broader higher education challenges. The difficulties of upholding quality assurance

at Philippine public colleges and universities are highlighted by Villanueva et al. (2022). By purposefully planning its academic programs and making continuous improvements, CBSUA has shown its power to overcome challenges.

Important findings from international research on higher education are reflected in the institution's accreditation approach. The Quality Assurance Agency for Higher Education in 2018 identified stakeholder engagement, ongoing improvement, and formal evaluation as fundamental measures. The way CBSUA works aligns closely with these values because its programs have managed to maintain and improve their accreditation status.

According to the World Bank (2021) study, these accreditation efforts help both students and their communities at large when schools provide quality education. Through rigorous accreditation requirements, CBSUA trains agricultural professionals who solve complex problems about food security sustainability and agricultural advancements.

Table 2. Undergraduate Program Accreditation(All campuses from 2017-2022)

ACCREDITABLE PROGRAMS	2017 LEVEL OF ACCREDITATION STATUS	2018 LEVEL OF ACCREDITATION STATUS	2019 LEVEL OF ACCREDITATION STATUS	2020 LEVEL OF ACCREDITATION STATUS	2021 LEVEL OF ACCREDITATION STATUS	2022 LEVEL OF ACCREDITATION STATUS
CBSUA - PILI CAMPUS						
A. Graduate Program						
1. Master of Science in Agricultural Education and Agricultural Extension	Level III Re accredited (Phase 1 of the 4th Survey revisit areas)			Level III Re-accredited[a] (Dec.16, 2020 – Dec.15, 2021)	Level IV Re-accredited (Dec. 16, 2021 – Dec. 15, 2026)	
2. Master of Science in Plant Science, Plant Protection, and Animal Science	Level III Re-accredited (Phase 1 of 4th Survey Revisit areas) (Oct. 2016 – Sept. 2020)				Level III Re-accredited[c] (Jan 2021 – Dec 2022)	
3. Ph.D in Plant Science	Level III Re-accredited Nov. 16, 2017 – Nov. 15, 2021					Level III Re-accredited[e] (June 2022 – May 2023)

a	The program is Level III. Passed the Phase I of two (2) Phases of evaluation in the 4th Survey visit. Has to undergo Phase 2.
c	The program is Level III. Assessment on going in Phase 1 of the 4th Survey Visit. Revisit all areas or only the identified ones.
e	The program is Level III. Subject to another revisit all areas or duly identified ones.

Mapping CBSUA's Global Academic Engagement

Working with partners around the world helps colleges and universities improve their programs and share information worldwide. This evaluation of CBSUA's international connections uses advanced theoretical guidelines and study results to explore global academic partnerships properly.

Geographic Distribution and Strategic Focus

The Asia-Pacific area dominates the cooperation landscape, with Southeast and East Asian institutions accounting for 45.9% of all collaborations. This focus on local partnerships mirrors research by Jones et al. (2021), who show how educational institutions learn most when they connect with others in similar places. Eleven out of all partnerships involve Indonesian universities, showing they use their geographic strategy to collaborate with specific cultural partners.

Partnership Typology and Engagement Modes

The partnerships exhibit a sophisticated, multi-dimensional engagement model. Comprehensive academic partnership, which includes teacher mobility, student exchanges, and research cooperation, is the subject of about 54.1% of agreements. The described internationalization approach matches the recommendations Brandenburg and Wit (2011) provided for complete internationalization programs. Specialized agreements, such as specialized training programs and student exchange programs, make up 27.0% of partnerships, whilst research-oriented collaborations make up 18.9% of agreements.

Temporal Evolution of Internationalization

The institution's partnership development demonstrates a strategic maturation process. An initial surge of 15 new partnerships in 2017 was followed by a more measured expansion, with 8 partnerships in 2019 and 3-4 annual agreements from 2020-2023. This pattern reflects de Wit and Altbach's (2021) observations about the shift from quantitative expansion to qualitative, sustainable international engagement. Five-year agreement durations represent 54.1% of all agreements, indicating organizations commit to sustained, meaningful partnerships.

Strategic Implications and Future Directions

There are chances for strategic improvement even though the current partnership portfolio shows strong regional connection. Potential regions for geographic diversification are indicated by the underrepresentation of African and Latin American institutions. The authors suggest a focused strategy for growing collaborations, concentrating on organizations that share complementary research capabilities and are in line with CBSUA's objective in agricultural education.

Table 3. List of Linkages of CBSUA

MOAs/ MOUs/ LOA	APPROVED BOARD RESOLUTION NO.	DATE SIGNED	PROGRAM	VALIDITY	EXPIRATION
InstitutPertanian Bogor University in Bogor Western Java, Indonesia	BOR No. 38s 203	November 9, 2023	Academic and Research and Innovation Programs	5years	
National Pingtung University of Science and Technology in Pingtung, Taiwan	BOR No. 38s 203	November 9, 2023	Academic and Research and Innovation Programs	5years	

Universitas Penbangunal Nasional "Veteran" Yogyokarta, Indonesia	BOR No. 38s 203	November 9, 2023	Education, Research and Community Services	5years	
UniversitiTeknologi Mara, Indonesia	BOR No. 11s 2023	October 6, 2022	Exchange of Students, Faculty and Researchers	5years	Nov. 2024
BIXTER, dk Aps - Denmark		July 27, 2022	Academic and Research particularly in Training program	none	
University of Tsukuba, Japan		August 24, 2021	Student Exhange Program	5years	
Ibaraki University, Japan		August 24, 2021	Student Exhange Program	5years	
The University of Central Missouri, USA		January 21, 2021	Academic and Research Programs particularly with the College of Development Education	3years	Jan, 2023
Oral Roberts University, Tulsa, Oklahoma, USA	BOR No. 71s 2020	October 8, 2020	Academic and Research Collaboration	3years	Oct, 2023
The University of Queensland, Australia		July 27, 2020	Research Collaboration		
North Carolina State University, USA	BOR No. 43s 2020	May 30, 2020	Academic and Research Collaboration	3years	May, 2023
MAEJO University, Thailand	BOR No. 43s 2020	May 30, 2020	Academic and Research Collaboration	5years	May, 2023
VIVES University of Applied Science, Belgium	BOR No. 43s 2020	February 17, 2020	Exchange of Students, Faculty and Researchers	5years	Feb, 2025
National Chung Hsing University, Taiwan	BOR No. 43s 2020	December 19, 2019	Exchange of Students, Faculty and Researchers	5years	Dec. 2024
Universitas Mataram (UNRAM), Indonesia	BOR No. 43s 2020	November 14, 2019	Exchange of Students, Faculty and Researchers	5years	Nov. 2024

Howest University of Applied Sciences, Belgium	BOR No. 43s 2020	November 14, 2019	Exchange of Students, Faculty and Researchers	None	None
Universitas Muhammadiyah Prof. Dr. Hamka (UHAMKA), Jakarta Indonesia	BOR No. 43s 2020	November 12, 2019	Exchange of Students, Faculty and Researchers	5years	Nov. 2024
Universitas Muria Kudus, Indonesia	BOR No. 43s 2020	November 6, 2019	Exchange of Students, Faculty and Researchers	5years	Nov. 2024
Virtual Farm Academy (VFA) and Sustainable Agriculture Food and Energy Network (SAFE), Thailand	BOR No. 43s 2020	October 20, 2019	Academic and Research Collaboration	None	None
Universal University, Indonesia	BOR No. 101s 2019	October 20, 2019	Exchange of Students, Faculty and Researchers	5years	Oct. 2024
International Cross-Cultural Exchange Professional Development, Indonesia	BOR No. 101s 2019	October 20, 2019	Exchange of Students, Faculty and Researchers	5years	Oct. 2024
Academic Cooperation Agreement among Pampanga State Agricultural University Philippines, Warmadewa University, Indonesia, Univesiti Technology of Mara, Malaysia, Chiang Mai University, Thailand	BOR No. 43s 2020	July 20, 2019	Exchange of Students, Faculty and Researchers	5years	July. 2024
Agrostudies The International Centre for	BOR No. 15s 2019	February 22, 2019	Internship Program	None	None

Agricultural Studies in Israel Ltd					
Academic Driven Innovation-International (AEDNO) NEERADA School, Laos	BOR No. 15s 2019	February 14, 2019	Internship Program	None	None
Agricultural Technology Universita Gadjah, Mada, Indonesia	BOR No. 101s 2019	December 18, 2018	Exchange of Students, Faculty and Researchers	5years	Dec. 2023
Letter of Agreement among Universities of Indonesia-Malaysia-Philippines-Vietnam-Thailand under the project "Pre-service Student Tacher Exchange in Sutheast Asia" (SEA-Teacher Project)	BOR No. 107s 2018	October 16, 2018	Exchange of Students, Faculty and Researchers	None	None
Northern University Bangladesh, Bangladesh	BOR No. 43s 2020	November 23, 2017	Exchange of Students, Faculty and Researchers	5years	Nov. 2022
Cambodian University for Specialties, Cambodia	BOR No. 43s 2020	November 23, 2017	Exchange of Students, Faculty and Researchers	5years	Nov. 2022
Universitas Pembanguan anPancudi, Indonesia	BOR No. 43s 2020	November 23, 2017	Exchange of Students, Faculty and Researchers	5years	Nov. 2022
Universitas Negeri Gorontalo, Indonesia	BOR No. 43s 2020	November 23, 2017	Exchange of Students, Faculty and Researchers	5years	Nov. 2022
VIT University, India	BOR No. 43s 2020	November 23, 2017	Exchange of Students, Faculty and Researchers	5years	Nov. 2022
Daffodil International University, Bangladesh	BOR No. 43s 2020	November 23, 2017	Exchange of Students, Faculty and Researchers	5years	Nov. 2022

Guangdong University of Foreign Studies, China	BOR No. 43s 2020	November 23, 2017	Exchange of Students, Faculty and Researchers	5years	Nov. 2022
Petra Christian University, Surabaya Indonesia	BOR No. 43s 2020	November 23, 2017	Exchange of Students, Faculty and Researchers	5years	Nov. 2022
Warmadewa University, Bali Indonesia	BOR No. 68s 2017	September 14, 2017	Mobility of Exchange Students and Short-Term Visit	3years	Sept. 2020
Sustainable Agriculture, Food and Energy (SAFE), Bali Indonesia	BOR No. 66s 2017	July 25, 2017	Academic and Research Collaboration	None	None
Kansas State University, Manhattan Kansas USA	BOR No. 67s 2017	May 20, 2017	Academic and Research Collaboration	None	None

Challenges Encountered in the Implementation of Graduate Programs

At Central Bicol State University of Agriculture (CBSUA), the implementation of graduate programs displays a complicated terrain of interrelated issues spanning administration, academic, student, and community dimensions.Drawing from an extensive mixed-methods approach, this analysis provides a nuanced understanding of institutional obstacles in agricultural graduate education.

Management Challenges

Administrative coordination and resource allocation emerge as vital management issues in Philippine public universities which reflect broader institutional problems. These results are supported by Oliver (2004) and Acido&Kilongkilong (2022), who draw attention to the ongoing resource shortages that higher education institutions face. Shao and Du's (2020) study on administrative complexity in agricultural institutions validates the problems of insufficient funding and equipment and building scheduling conflicts identified in this research. Given that present administration obligations frequently take precedence over faculty members' primary teaching duties, there is an especially clear need for specialist administrative support.

> **Department Head**: *"Mahirapi-balance ang resources natin kasi limited ang budget. Minsan nagkaka-conflict sa schedule ng facilities at equipment sharing."* (It's difficult to balance our resources because of a limited budget. Sometimes there are conflicts in facility schedules and equipment sharing.)
>
> **Administrator**: *"Kailangannamin ng mas maraming support staff para sa graduate programs. Yung ibakasing administrative tasks, napupuntasa faculty nadapatnagtuturo."* (We need more support staff for graduate programs. Some administrative tasks end up with faculty who should be focusing on teaching.)

Faculty Challenges

Workload management alongside research supervision represent the primary issues faculty members encounter in their work environment and align with broader academic workplace challenges. These worries are supported by Fernández-Suárez et al. (2021), who report high levels of faculty burnout in graduate programs in the Philippines. There is a lot of strain from the many duties of teaching, research, extension work, and thesis advising, which could lower the standard of education. The faculty productivity study conducted by World bank (2019) demonstrates the complex equilibrium required in agricultural education between specialized knowledge and multiple roles.

> **Senior Professor**: *"Sobrang loaded ng teaching units namin. Tapos may research pa, extension work, at thesis advisory. Hindi naminsanmakafocussa quality."* (Our teaching units are overloaded. Plus we have research, extension work, and thesis advisory. Sometimes we can't focus on quality.)
>
> **Faculty Member**: *"Mahirap mag-maintain ng work-life balance lalona'tkulang kami sa specialized faculty sa certain areas."* (It's hard to maintain work-life balance, especially since we lack specialized faculty in certain areas.)

Student Challenges

Available data indicates students struggle intensely when trying to balance their academic workload with their professional commitments. These findings are given context by Zhang et al.'s (2024) study on graduate students' experiences during the pandemic. One major obstacle to student achievement is the fundamental effort to balance work obligations with academic needs. Pontillas et al. (2024)phenomenological study demonstrates through research findings that graduate student persistence depends on adaptable academic environments alongside encouragement.

> **Student 1**: *"Ang hirapi-juggle ang work sa school. Minsan hindiakomakapasoksaklase kasi may urgent sa office."* (It's difficult to juggle work and school. Sometimes I can't attend class because of urgent office matters.)
>
> **Student 2**: *"Challenge talaga ang thesis writing kasi walakaming dedicated time. Pag-uwisabahay, puyat ka nasa work, tapos mag-aaral ka pa."* (Thesis writing is really challenging because we don't have dedicated time. When we get home, we're already tired from work, and then we still need to study.)

Community Challenges

Community interaction is another important aspect of programmatic issues. Thammi-Raju et al.'s (2021) research on curriculum relevance highlights the important necessity for academic programs to fit with regional agricultural sector requirements. Current research shows a significant divide exists between academic scholarship and community needs, which reflects broader problems in university-industry partnerships. According to Soam et al. (2023), collaborative approaches enable genuine knowledge transfer and practical implementation.

> **Community Leader**: *"Maganda sana ang programs, perominsanhindi aligned sa actual needs ng agricultural sector ditosa region."* (The programs are good, but sometimes they're not aligned with the actual needs of the agricultural sector in our region.)

Industry Partner: *"Kailangan ng mas malakasna collaboration between academia at industry. Yung research output dapat may direct application sacommunity."* (We need stronger collaboration between academia and industry. Research output should have direct community applications.)

Theoretical and Practical Implications

The barriers identified are not attributable to single institution issues because they stem from fundamental organizational complexities in agricultural higher education. The research results match Bustos-Orosaand Symaco's (2019) discussions for comprehending higher education challenges, thus validating that CBSUA's challenges mirror Philippine tertiary education trends. The convergence of management issues with academic matters and student needs, along with community interests, demonstrates why programs require complete integrated development and implementation approaches.The analysis of these issues benefits from Resource Dependence Theory (Pfeffer &Salancik, 1978) and Enrollment Management Theory. These theories demonstrate how institutional resources interact dynamically with stakeholder expectations while organizations need to adapt to survive.

CONCLUSION

The comprehensive analysis of Central Bicol State University of Agriculture's (CBSUA) graduate programs from 2017 to 2023 reveals a complex landscape of agricultural higher education that demonstrates remarkable resilience and strategic potential. Through the lens of Resource Dependence Theory and Enrollment Management Theory, this study uncovers critical insights into institutional adaptation and resource optimization in agricultural graduate education (Pfeffer &Salancik, 1978; Hossler et al., 2012).

The graduate programs of the school have a complex performance trajectory that includes both strategic strengths and noteworthy problems. As evidence of the program's responsiveness to local agricultural human capital demands, the Master of Science in Agricultural Education stands out as a particularly strong argument. It has maintained consistently high enrollment and attained Level IV certification (Ancho, 2020; Mulder & Kupper, 2006). The faculty members demonstrate progressive characteristics through their high percentage of terminal degree holders alongside strong female representation (57-89%), consistent with contemporary discussions about academic leadership gender diversity (Mars & Hart, 2017).

During the COVID-19 pandemic, the institution showed flexibility through steady enrollment numbers across all programs. This resilience reflects broader trends in agricultural education's capacity to maintain educational continuity during unprecedented global challenges (Chakraborty et al., 2021). But the study also revealed important implementation issues in the areas of administration, faculty, students, and the community, pointing to areas for strategic institutional growth.

CBSUA demonstrates strategic partnership management through its 45.9% Asia-Pacific-focused collaborations, which make up its global partnership strategy. The institution follows Kinney's (2021) observation that strategic geographical concentration mirrors contemporary academic standards by emphasizing connection quality rather than quantity. The institution presents a holistic academic global engagement model that prioritizes authentic, meaningful cultural partnerships.

The findings contribute significantly to understanding agricultural graduate education's dynamic landscape in the Philippines. The research demonstrates how

faculty development, student experiences, institutional resources, and community engagement create complex interconnections. A thorough road map for institutional reform is offered by the suggested policy actions, which range from resource management to research assistance (Villanueva et al., 2022).

This study uses a mixed-methods approach, which provides an effective method to research complex educational systems. Future studies should expand this research model through detailed comparative assessments of different agricultural education institutions while examining how proposed policy changes affect their long-term outcomes.

The experiences of CBSUA mirror worldwide challenges and opportunities present in agricultural higher education institutions. CBSUA demonstrates valuable insights to global educational policymakers and institutional leaders through its management of high-quality graduate programs under resource constraints and pandemic disruptions (World Bank, 2021; OECD, 2008).

The research shows that effective agricultural graduate education demands an integrated method that combines academic strength with institutional adaptability and strategic planning. CBSUA demonstrates how agricultural higher education can drive sustainable regional development through continuous program refinement while maintaining forward-looking perspectives and industry and community stakeholder engagement.

RECOMMENDATIONS

The proposed recommendations designed for CBSUA's graduate programs build a thorough approach to solve institutional hurdles in agricultural education. The strategy focuses on six critical areas: resource management, faculty development, student support, community engagement, research innovation, and quality assurance. Creating a specific Graduate School Resource Management Office supports the institution to make optimized resource distribution decisions and build sustainable funding mechanisms by developing partnerships with industry. The institution will establish programs to improve academic excellence and professional growth through targeted teaching load policies accompanied by mentoring systems and competitive incentive programs.

The student support framework will receive a redesign to serve working professionals through adaptable course schedules and thorough thesis guidance and combination learning methods addressing work-life balance needs. The recommendations emphasize strengthening community and industry connections through a Graduate School-Industry Advisory Board, which will facilitate curriculum reviews and create mandatory industry internship programs. The proposed research and innovation ecosystem will receive funding for graduate research while establishing publication support units and technology transfer offices for knowledge translation.

A quality assurance framework will emerge through an assessment system that includes independent program evaluations and student feedback mechanisms and benchmarking activities with top agricultural universities. Successful implementation needs institutional dedication and strategic budgeting and active stakeholder participation following a phased approach with strict monitoring and evaluation. CBSUA will evolve its graduate programs into a progressive agricultural education and research leader by implementing these proposed recommendations.

The proposed strategy demonstrates advanced thinking by moving past standard improvement models to provide detailed guidance for institutional evolution.

The proposed strategy integrates operational enhancements with future-focused sustainable academic development to create an exemplary model for graduate agricultural education excellence.

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