

Establishing a Regional Agribusiness Hub in Northern Mindanao: A Framework for Technology Commercialization and Capacity Building

Abstract

Despite the valuable agricultural research produced by State Universities and Colleges (SUCs) in the Philippines, persistent underutilization limits its potential to drive regional economic growth. Promising innovations frequently fail to transition from the laboratory to the market. To bridge this gap, this project establishes a sustainable Regional Agribusiness Hub (ABH) in Northern Mindanao, creating a structured pathway to commercialize academic research and accelerate market adoption. The primary objective was to create a functional innovation ecosystem that bridges the gap between research and market application. The methodology employed a multi-faceted framework encompassing intensive capacity building, delivery of comprehensive pre-commercialization services, and the cultivation of strategic partnerships. Key initiatives included an Agribusiness Mentorship Series and specialized agripreneurship training to enhance the skills of staff from Consortium Member Institutions (CMIs). The project successfully trained CMI personnel and significantly overachieved its targets for producing critical commercialization documents, including business plans, feasibility studies, technology valuation report and commercialization plan for technologies with promising commercialization potential. Furthermore, strategic partnerships were forged with key regional players such as Local Chambers, Government institutions supporting MSME growth. The project's long-term sustainability is anchored in the formal institutionalization of the hub through the Intellectual Property and Technology Business Management (IPTBM) Policy. This initiative not only created a vibrant innovation ecosystem in the region but also provides a robust, replicable model for technology transfer and commercialization in the Philippine agri-aqua sector.

Keywords
Agribusiness Hub, Technology Commercialization, Capacity Building, Innovation Ecosystem, Pre-commercialization, Northern Mindanao

Author
Dr. Annie L. Deriada
Professor, Department of Agribusiness Management, College of Agriculture Central Mindanao University, Email: an68deriada@gmail.com, <https://orcid.org/0009-0004-9393-7771>

Correspondence to:
Dr. Annie L. Deriada
Professor, Department of Agribusiness Management, College of Agriculture Central Mindanao University
e-mail: an68deriada@gmail.com
ORCID: 0009-0004-9393-7771

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INTRODUCTION

The Regional Agribusiness Hub project, a key component of the Regional Agri-Aqua Innovation System Enhancement (RAISE) Program, was designed to foster the growth of sustainable agribusiness hubs within selected Consortium Member Institutions (CMIs). These hubs aimed to provide essential business skills training to staff, equipping them to effectively manage centers dedicated to technology transfer and commercialization. The project facilitated the preparation of business plans and feasibility studies, essential for securing funding and scaling operations. In addition, it established strategic partnerships with business entities to enhance the commercialization of agricultural technologies. A primary focus of the initiative was to address the underutilization of research outputs by creating an enabling environment for the commercialization of technologies developed by State Universities and Colleges (SUC) researchers.

In its first phase, the project focused on organizing the regional agribusiness team and establishing a conducive environment for agribusiness development. Key activities included the initial drafting of an operational manual for the agrihub, an inventory of research outputs, and the development of training modules for capability-building programs. Furthermore, the project provided pre-commercialization services, such as agribusiness coaching, mentorship, and commercialization processing, to support technology transfer.

REVIEW OF LITERATURE

The Republic act 10055 or the "Philippine Technology Transfer Act of 2009, that provides the framework and support system for the ownership, management, use, and commercialization of intellectual property generated from research and development funded by government and for other purposes, aimed to promote and facilitate the transfer, dissemination, and effective use, management, and commercialization of intellectual property, technology and knowledge resulting from R&D funded by the government for the benefit of national economy and taxpayers. It recognizes that science, technology and innovation are essential for national development and progress. research and development, invention, innovation and their utilization shall be given utmost priority. It also encourage the widest and most systematic participation of all stakeholders in policy-making related to science and technology, and in the generation, transfer and utilization of intellectual property, especially for the benefit of the general public. (<https://www.fao.org>)

The State is also mandated to facilitate the transfer and promote the utilization of intellectual property for the national benefit and shall call upon all research and development institutes and/or institutions (RDIs) that government-funded research and development (R&D) to take on technology transfer as their strategic mission and to effectively translate results of government-funded R&D into useful products and services that will redound to the benefit of Filipinos, notwithstanding the income generated from intellectual property rights (IPRs) and technology transfer activities. Moreover, the State acknowledges that the successful transfer of government-funded R&D results is greatly dependent on the proper

management of intellectual property, capacitating the RDIs to become self-sustaining and competitive, and on enhancing interaction and cooperation with the private sector, particularly small and medium enterprises through collaborative and contract research based on equitable, accessibility, and mutual benefit for all stakeholders.

In support to the Philippine Technology Transfer Act of 2009, The State recognizes the importance of an effective and efficient innovation ecosystem that addresses and delivers action in various policy areas, including MSME development, education, trade, investment, finance, and agriculture, sustainable energy, climate change, among others. Thus RA 11293 was promulgated known as the "Philippines innovation Act" which requires the various departments and agencies of government to implement a "whole of government" approach that shall ensure policy coherence, alignment of priorities, and effective coordination in program delivery.

It mandated the state to a) place innovation at the center of its development policies, guided by a clear and long-term set of goals that shall take into consideration the key advantages of the country and the opportunities in the regional and global economic arena. As such, it shall harness innovation efforts to help the poor and the marginalized, enable micro, small and medium enterprises (MSMEs) to be a part of the domestic and global supply chain, and catalyze the growth of Philippine industries and local economies; (b) promote a culture of strategic planning and innovation resulting in a more inclusive, competitive and results-oriented development framework, and ensure that knowledge is created, acquired, disseminated, and used more effectively by individuals, enterprises, organizations, and communities to promote sustainable economic and social development; (c) ensure that Investments in education, science, technology and innovation shall be guided by a strategic direction towards strengthening the country's knowledge-based economic development that benefits all. Innovation starts with a robust pool of skilled, talented and creative people. Educational institutions, private organizations, businesses, government agencies and local government units (LGUs) are key drivers of programs that stimulate innovation literacy and skills development for the Filipino workforce and entrepreneurs, including women and the youth. It also recognizes the importance of an effective and efficient innovation ecosystem that addresses and delivers action in various policy areas, including MSME development, education, trade, investment, finance, and agriculture, sustainable energy, climate change, among others. This requires the various departments and agencies of government to implement a "whole of government" approach that shall ensure policy coherence, alignment of priorities, and effective coordination in program delivery. With this RA11293, the business sector, academe, scientific community and research institutions are recognized to have a crucial role in driving inclusive economic growth through innovation. As such, the government shall work and cooperate with these sectors and encourage the innovation-driven efforts of businesses, MSMEs, academe, and the scientific community. Public sector innovation plays a key

economic role whereby an efficient public sector can drive more private sector growth across industries. To this end, the State shall promote, integrate and strengthen policies that engage with innovative businesses and entrepreneurs on collaboration efforts to improve productivity, good governance and efficient delivery of public services.

The Philippine Development Plan for 2017-2022 envisions a Matatag, Maginhawa, at Panatag na Buhay for Filipinos with its core strategies of Malasakit, Pagbabago, and Patuloy na Pag-unlad. Strategies in Pagbabago include programs geared towards providing opportunities for growth in income and output among economic groups, with emphasis on small farmers, fisher folks and Micro, Small and Medium Enterprises (MSMEs). The below-target accomplishment of Agriculture, Forestry and Fishery (AFF) sector since 2015 drives the new plan to focus on increasing farm productivity, efficiency in value-adding processes, industry linkages and effective commercialization of agricultural products (National Economic and Development Authority, 2017).

The Department of Science and Technology established world class state-of-the-art STI facilities that encourage R&D activities, deliver ease of access to local Micro, Small, and Medium Enterprises (MSMEs), contribute to the country's Disaster Risk Reduction initiatives and improve the quality of service to the people. This initiative of DOST will enable the rise in productivity, competence, and efficiency of the DOST Research and Development Institutes (RDIs) and strengthen the bond with its industry partners, academes and other linkages.

The regional R&D Agenda is aligned with Ambisyon Natin 2040: matatag, maginhawa, at panatag na buhay para sa lahat. Supported by the three (3) pillars: Malasakit (enhancing the social fabric), Pagbabago (reducing inequality) and Kaunlaran (increasing potential growth) which are braced by inclusive growth, hightrust and resilient society and globally competitive knowledge economy. It is also aligned with the Harmonized National R&D Agenda of DOST, R&D priorities of DA and other relevant institutions. A Stakeholders' Consultative Meeting was conducted last 11 May 2018 in cooperation with the Bicol Consortium for Agriculture, Aquatic and Natural Resources (BCAARRD), Bicol Consortium for Health Research and Development (BCHRD), and Bicol Consortium for Industry, Energy and Emerging Technology (BCIEERD) and Commission on Higher Education in pursuit of crafting the draft R&D Agenda. Prior to this activity, the three (3) consortia and CHED V have already existing research agenda according to the region's priority. Through the consultative meeting conducted the different stakeholders were enjoined to help in the validation and identification of other areas of research that corresponds to the needs of the region. (Regional R&D Agenda 2018-2022)

This regional R&D Agenda in AANR 2018-2022 is an integration of the existing R&D agenda and priorities various government agencies conducting R&D in said sector including inputs from different stakeholders and identified Research priorities in Aquatic and Natural Resources.

Challenges, however, on market preferences, difficulty in the commercialization process threaten interest researcher

and sustainability of technology transfer and commercialization particularly in the academic world., Thus there is a need to established Agribusiness regional Hub and capacitate staff managing the hub.

This project responds to the challenge of producing research outputs and technology that can be easily transferred and needed in the market. It addresses the Sustainable goal of having a descent work and economic growth. The project's output is expected to guide formulation of policies and interventions in institutionalization of a Regional Agribusiness Hub.

METHODOLOGY

Conceptual Framework

The acronym "RAISE" represented crucial elements: Regional Capacity Building and Mentorship, which focused on strengthening local skills through targeted training; Agri-Aqua Technology Business Development, which fostered business growth in the agri-aqua sector; Enhanced Knowledge Management, which promoted the effective exchange and application of knowledge; Strategic Partnership and Collaboration, which highlighted the importance of partnerships among stakeholders for successful commercialization; and Intellectual Property Management, which ensured the protection and commercialization of innovations.

The framework's primary objective was to hasten commercialization and develop science and technology-based agri-aqua enterprises in the region. It created an active agri-aqua innovation ecosystem that maximized the economic potential of science and technology innovations in agriculture and aquaculture. Through coordinated efforts, the RAISE Program aimed to accelerate regional development and fully realize the economic benefits of agri-aqua technologies.

1. Preliminary Administrative Activities Pre-implementation Phase

1. Inventory and TRL Assessment – This involved evaluating matured technologies within the institution or organization. The assessment and validation of technologies ready for commercialization were conducted in collaboration with the IP-TBM, which maintained a database of completed research and granted intellectual properties (IPs).

2. Capacity Building Activities – This phase included the development of training modules and the preparation of training reports. The 10-day Agribusiness Master Class (ABMC) and re-echo were conducted to enhance the capacity of selected CMI staff in agribusiness. Participants were trained in key areas such as value chain analysis, business canvas models, market studies, marketing of agricultural products, operations, production plans, and business permits and requirements. A regional re-echo session was also conducted. In addition, training and mentoring on pre-commercialization services were provided, equipping CMI staff with skills in preparing business plans, feasibility studies, market studies, valuations, and enterprise development plans.

3. Promotional Activities – This involved the planning and organization of awareness seminars, exhibits, and social media campaigns. Promotional tools such as print materials, radio programs, social media posts, and face-to-face interactions were prepared, especially for promoting the market study activity.

Implementation Phase

4. Pre-commercialization Services – This included training and mentoring on the preparation of feasibility studies, market studies, valuations, business plans, and enterprise development plans, with a focus on supporting the commercialization of technologies developed during the project.

5. Coordination, Monitoring, and Evaluation – The coordination, monitoring, and evaluation of the different CMIs involved in the project were conducted regularly. Monthly monitoring and evaluation sessions were held to assess the progress and performance of the CMIs participating in the project. This process ensured the effective execution of the project and supported continuous improvements throughout its implementation.

6. Packaging Research Outputs and Identifying Partner Companies – This included the packaging of research outputs and the identification of potential partner companies for technology commercialization.

RESULTS & DISCUSSION

Building capacities of selected CMI staff on agribusiness development through trainings and mentorship.

The series of training and mentorship activities implemented under the RAISE Agribusiness Hub (ABH) significantly contributed to enhancing the entrepreneurial capacity of stakeholders in Northern Mindanao, particularly among the Central Mindanao University (CMU) participants and regional partners. Three major reports highlighted the outcomes and collective impact of these initiatives: the Consolidated Training Report of all CMU participants in the Agribusiness Mentorship Series (ABMS), the Training Report on the Regional Echo ABMS, and the Training Report on Agripreneurship.

1. Coordinated Facilitation of CMI Participants in the National ABMS

The Coordinated Facilitation of Central Mindanao University (CMU) participants in the National Agribusiness Mentorship Series (ABMS) highlighted the university's active role in capacitating its faculty, staff, and affiliated entrepreneurs under the RAISE Agribusiness Hub (ABH) Project. Through close coordination with the national organizers of the ABMS, CMU successfully mobilized and supported participants in attending a series of mentorship sessions focused on enterprise development, agribusiness planning, and technology commercialization.

The Consolidated ABMS Report documented the comprehensive mentorship journey of CMU participants who underwent a series of structured sessions focused on business model development, financial literacy, marketing strategies, value chain analysis, and technology commercialization. The mentorship series served as a practical learning platform where participants translated

theoretical knowledge into viable agribusiness plans. The consolidation of participant outputs reflected both individual growth and institutional strengthening, as CMU trainees gained the capacity to mentor others and served as resource persons for subsequent regional activities.

Building on this, the Regional Echo ABMS Training extended the learnings and best practices of the initial mentorship series to other partner institutions and MSMEs within Northern Mindanao. This echo-training exemplified the hub's cascading approach to capacity-building, as trained CMU participants transferred knowledge to new beneficiaries. The activity promoted peer-to-peer learning and strengthened collaboration among SUCs and local stakeholders, reinforcing the role of the RAISE ABH as a knowledge and innovation conduit in the region.

Meanwhile, the Agripreneurship Training provided targeted interventions for emerging and existing agri-based entrepreneurs. The sessions emphasized opportunity identification, business planning, risk management, and the adoption of innovative technologies. The training also featured successful agripreneurs and industry mentors who shared real-world experiences, inspiring participants to pursue business ventures aligned with sustainable and inclusive growth in the agri-aqua sector.

Collectively, these reports demonstrated the progressive and interconnected design of the RAISE ABH capacity development component. The transition from CMU-based mentorship to regional echo training and specialized agripreneurship sessions reflected a strategic scaling of knowledge, fostering both individual competency and institutional collaboration. These initiatives strengthened the regional ecosystem for agribusiness development and contributed directly to achieving the project's objective of building the capacity of stakeholders toward technology-based enterprise creation and commercialization.

The facilitation process ensured that all CMU participants were properly endorsed, oriented, and monitored throughout the mentorship program. This coordination included logistical support, communication with the implementing national partners, and post-session documentation of learnings and outputs. The approach exemplified CMU's commitment to enabling its participants to fully engage in national-level learning activities that strengthened their competencies in agribusiness management.

Moreover, the involvement of CMU participants in the National ABMS allowed them to benchmark best practices and innovative models from other regions, which they later contextualized and shared through institutional and regional echo trainings. This participation not only enhanced individual learning but also contributed to the collective capacity of the Regional Agribusiness Hub to mentor other local stakeholders and MSMEs.

The coordinated facilitation process demonstrated the effectiveness of CMU's role as a proactive partner institution in the RAISE ABH framework. By ensuring the smooth participation and performance of its representatives in national initiatives, the university

helped strengthen the alignment between national mentorship programs and regional agribusiness development efforts in Northern Mindanao.

2. Capability Building Activities

Regional Echo Agribusiness Mentorship Series (ABMS)

The Agribusiness Mentoring Series (ABMS) Re-Echo Program served as a vital knowledge-sharing and capacity-building initiative under the RAISE Agribusiness Hub (ABH) Project. It was designed to cascade learnings from the national mentorship series to regional stakeholders. The training enhanced participants' competencies in agribusiness development, with emphasis on Intellectual Property (IP) valuation, entrepreneurial mindset, market analysis, business planning, feasibility studies, and enterprise development. Participants gained a deeper understanding of how IP assets, such as patents and trademarks, enhanced the value and competitiveness of agribusiness ventures. The sessions on IP valuation introduced practical methods including the cost, market, and income approaches, and demonstrated how IP supported pricing, licensing, and investment decisions. The product presentations demonstrated how IP and financial analysis contributed to investor confidence and commercialization readiness.

The Entrepreneurial Mindsetting session emphasized the importance of resilience, adaptability, and creativity in managing the uncertainties of the agri-aqua industry.

Meanwhile, the Financial Planning and Market Study modules taught participants how to manage finances strategically and use market data to guide business decisions.

The program also clarified the distinction between feasibility studies and business plans, enabling participants to assess business potential before proceeding to the implementation stage. The Business Plan Development session provided frameworks for developing fundable proposals supported by financial indicators and market data. The Enterprise Development Program (EDP, guided participants in preparing enterprise development plans that integrated market, technical, and financial aspects to ensure business sustainability.

Discussions from government agencies, further equipped participants with knowledge of available support programs on funding, compliance, and technology commercialization. Overall, the ABMS Re-Echo Program strengthened participants' entrepreneurial capacities and positioned them to develop market-driven, innovative, and sustainable agribusiness ventures in the region.

3. Agri-Entrepreneurship Training

The Agri-Entrepreneurship Training aimed to enhance the entrepreneurial capabilities of participants, particularly agripreneurs from research institutions and State Universities and Colleges (SUCs) in Northern Mindanao. Anchored under the Regional Agribusiness Hub (ABH), the training focused on developing essential skills for launching successful agribusiness ventures, with emphasis on the preparation of effective business plans and proposals.

Through capacity-building activities such as write-shops, mentoring sessions, and technical lectures, participants were guided in developing feasibility studies, market analyses, and business plans that supported the commercialization of Agriculture, Aquatic, and Natural Resources (AANR) technologies. The write-shop methodology allowed participants to gain practical experience in writing and refining business plans under the supervision of experts, combining theoretical learning with real-world application. The two-day training covered modules on crafting business, marketing, production, and financial plans, with active participation through discussions, feedback sessions, and proposal presentations.

Participant feedback reflected strong appreciation for the program's relevance and practicality. Many participants valued the focus on business plan development and entrepreneurial mindset, noting how real-world examples and financial planning exercises clarified the process of transforming ideas into viable ventures. The workshop outputs included several comprehensive business plans and proposals, integrated production strategies and market development.

Participants also recognized the importance of structured planning, market research, and financial analysis in securing investment and supporting technology commercialization. Their recommendations included expanding sessions on marketing and financial strategies, conducting follow-up trainings for continued mentoring, and engaging more faculty and students with entrepreneurship expertise to strengthen the pre-commercialization initiatives of the ABH.

The Agri-Entrepreneurship Training effectively equipped participants with the knowledge, tools, and confidence needed to develop sustainable, market-driven agribusinesses. By combining practical experience with theoretical guidance, the program prepared them to contribute meaningfully to regional innovation, entrepreneurial growth, and the commercialization of AANR technologies.

Packaging various R&D outputs to support the development and operation of viable AANR-based enterprises;

Central Mindanao University (CMU) led Regional Agribusiness Hub exceeded its original targets for business plans, feasibility studies, and market studies, producing five outputs for each category against a target of two. These documents covered several promising agri-based technologies and products. This accomplishment reflected CMU's strong implementation of enterprise planning and market assessment activities, which provided a solid foundation for commercialization and technology adoption. For intellectual property (IP) and enterprise planning outputs, CMU prepared one IP Valuation and one Enterprise Development Plan (EDP) focused on the Banana Flour Premix technology. These outputs emphasized CMU's initiative to advance the commercialization readiness of selected technologies with strong potential for market entry.

Assist Consortium Member Institution in conducting various pre-commercialization activities across the region.

The RAISE Program, pre-commercialization services were integrated with the Re-Echo of the Agribusiness Mentoring Series (ABMS) as part of the Year 1 catch-up plan. This integration addressed implementation gaps and ensured that participants were fully equipped to apply the skills and knowledge they had acquired in the previous year. The combined approach provided a comprehensive framework for transitioning research outputs into commercial-ready technologies. Pre-commercialization services, including feasibility studies, market research, business plan development, product promotion, valuation, and enterprise development planning, were implemented alongside the Re-Echo of ABMS to provide additional support in refining commercialization strategies.

The Re-Echo of ABMS reinforced key areas such as technology transfer, marketability assessment, and business planning. It served as a platform for CMI staff to revisit and strengthen their commercialization strategies for the technologies identified in Year 1. Through practical exercises, hands-on activities, and collaborative discussions, participants gained clearer insights into the effective application of pre-commercialization services for their banner commodities and technologies.

In addition, CMU assisted in the development of three business plans under the CMU Agri-based Technology Business Incubator (ATBI) and one business plan under the Department of Agriculture Technology Business Incubator (DA-TBI). The business plans developed through these collaborations included Adlay Breakfast Cereals, KPG Sinamak, Herfran's Coffee, and Nday Sarah Hito Production, further demonstrating CMU's support to technology generators and MSME partners in strengthening enterprise creation and expansion.

The completion of these pre-commercialization documents showed CMU's capacity to transform research-based technologies into structured, investment-ready enterprise proposals. By exceeding its targets and supporting both institutional and external partners, CMU strengthened the pathway for technology commercialization, enterprise development, and market-driven innovation in the agri-aqua sector. Table 6 showed the list of pre-commercialization documents developed or assisted by CMU.

The preparation of these studies reflected the project's strong implementation of enterprise planning and market assessment activities, which provided a solid foundation for potential commercialization and technology adoption. The pre-commercialization outputs highlighted a targeted approach toward technologies with strong potential for protection, enterprise development, and market entry. Although the number of IP valuation reports remained limited, the increased production of EDPs underscored the project's progress in strengthening commercialization readiness and guiding partner institutions in enterprise development. This focused effort contributed significantly to the project's goal of institutionalizing a sustainable pathway for agribusiness innovation and enterprise growth in the region.

The integration of pre-commercialization services with the Re-Echo of ABMS created a stronger mechanism for helping CMIs address previous implementation gaps and refine their commercialization strategies. This initiative fostered closer collaboration among partner institutions, improved access to potential funding opportunities, and strengthened the market readiness of developed technologies for broader adoption.

Coordination in the RAISE Program

Coordination served as a fundamental process that ensured alignment and collaboration among all stakeholders involved in the RAISE Program. These stakeholders included Consortium Member Institutions (CMIs), researchers, business partners, and other collaborators. By maintaining clear communication channels and providing regular updates, the program ensured that all stakeholders remained aligned and worked toward common objectives.

Year one of the RAISE was to establish initial frameworks for collaboration and ensure that each stakeholder clearly understood its role in the program. Regular meetings, reports, and progress updates were conducted to monitor key activities, including the development of business plans, IP inventories, and the promotion of technology commercialization. These activities were monitored to ensure that they progressed according to planned timelines.

This coordination helped maintain project momentum, resolve concerns, and address unforeseen challenges that emerged during program implementation. It also strengthened the working relationship among partner institutions and supported the smooth execution of activities under the RAISE Program.

Monitoring through the Real Time Monitoring System (RTMS)

In Year 1, the RAISE Program relied on the Real-Time Monitoring System (RTMS) to track the execution of activities, monitor progress, and provide real-time data on key performance indicators (KPIs). The RTMS was a dynamic tool that captured detailed information on all ongoing projects, technologies, and activities within the program. This system served as a centralized databank, allowing stakeholders to access and analyze data on technology development, commercialization efforts, and overall program performance. The real-time nature of the system enabled the immediate detection of deviations from the plan, allowing corrective actions to be implemented in a timely manner.

The review also identified the need for consolidated IP and technology inventories, the pending submission of spin-off policies, and the inclusion of non-CMI contributions in impact reporting. Insights gained from the review included the clear differentiation between income-generating projects and true commercialization income, the necessity of maintaining updated technology and IP inventories (which should have been completed in Phase 1), the importance of tracking active participants for regional reporting, and the need for each institution to prepare a commercialization plan. Lastly, spin-off policy updates were scheduled for submission by September.

The activity underscored the importance of collaborative alignment among the CMIs in achieving the overall objectives of the RAISE Program. The feedback provided by the DOST-PCAARRD evaluators was instrumental in identifying areas for improvement and offered actionable recommendations that enhanced program implementation and streamlined reporting processes. The workshop highlighted the significance of regional synergy, emphasizing that addressing the specific needs of each project within the context of regional support was essential for the success of the program. This collective effort ensured that regional initiatives were not only responsive to the needs of individual projects but also aligned with the broader goals of the RAISE Program, leading to more effective and sustainable outcomes.

Overall, the RAISE Program's evaluation and adjustment processes, supported by monitoring tools such as the RTMS, ensured that the program remained responsive to emerging needs and challenges. Feedback from DOST-PCAARRD evaluators and the resulting workshops strengthened collaboration among CMIs, addressed identified gaps, refined implementation strategies, and reinforced the importance of regional synergy and comprehensive impact documentation. These efforts contributed to more effective program implementation and supported the achievement of sustainable and impactful outcomes across the RAISE Program.

Packaging Research Outputs and Identifying Partner Companies

Showcasing Innovation: Highlights from the RAISE-10 Summit and Project 2's Role in Agri-Aqua Technology Commercialization

The RAISE-10 Summit, provided a platform to showcase the progress of the RAISE Program. A key highlight was the Project 2: Establishment of the Regional Agribusiness Hub (ABH) booth, which displayed technologies and products developed by the State Universities and Colleges (SUCs). This booth demonstrated the program's focus on supporting the commercialization of agri-aqua innovations in Northern Mindanao.

The agribusiness hub featured a variety of products, including Purple Sweet Potato Flour, Pineapple Tomato Jam, and Purple Sweet Potato with Pineapple Wine from CMU, as well as Banana Flour, Banana Cookies, and Brownies.

These products showcased the potential of utilizing local agricultural resources in creating market-ready items. Other Consortium Member institution presented Flavored Tilanggit and Bottled Bangus, Nutri-chicharon, Maizesarap Corn Spread, and cream cheese. These products highlighted the diversity of agri-aqua innovations developed with the program's support.

The booth served as a key demonstration of how the RAISE Program assisted CMIs in advancing their technologies from research to market. It underscored the importance of technology transfer, business development, and market readiness. The booth's presence was also covered by the Philippine News Agency through a report which helped increase awareness of the program's impact and attracted potential investors and partners.

The summit also featured the unveiling of the RAISE-10 Logo, which symbolized unity and innovation, as well as

the signing of the Expression of Support by leaders from government and implementing agencies. These activities emphasized the collective commitment to advancing the program's goals. The ribbon cutting and opening of exhibits allowed the public and stakeholders to explore the innovations on display, further promoting collaboration and engagement.

The ABH booth played a significant role in showcasing the results of the RAISE Program, highlighting the successful transition of research innovations into market-ready products. This event reinforced the program's role in driving the growth and development of Northern Mindanao's agri-aqua sectors, creating a foundation for future collaboration and commercialization.

Forging partnerships with business companies for technology commercialization.

The Regional Agri-Aqua Innovation System Enhancement (RAISE)- Regional Agribusiness Hub (ABH) led Central Mindanao University (CMU) continued to build and strengthen strategic partnerships across Northern Mindanao to promote innovation-driven agribusiness, technology commercialization, and inclusive economic growth. Supported by the Department of Science and Technology-Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development (DOST-PCAARRD), these partnerships involved collaboration with higher education institutions, local enterprises, government agencies, and business chambers.

One of the key collaborations was with Bukidnon PRIME (Program for Research and Innovation toward MSME Excellence), which provided business development, market access, and intellectual property (IP) management services to support the commercialization of technologies developed by CMU and Bukidnon State University. This ongoing partnership strengthened the innovation ecosystem by assisting local researchers and micro, small, and medium enterprises (MSMEs) in transforming technologies into market-ready products. Additionally, the BIDANI-RAISE collaboration focused on improving nutrition in Bukidnon through a pilot feeding program that featured locally developed nutritious food products using Purple Sweet Potato Flour, Banana Flour, Nutri-Chicharon, and Corn Spread. These initiatives helped address malnutrition while supporting local farmers and small-scale producers.

The DTI-CMU partnership remained active in commercializing coconut-based food technologies developed through the DTI-funded project "Development and Innovation of Coconut-Based Food Products." Through a Memorandum of Agreement (MOA) and Technology License Agreement (TLA), both institutions jointly owned four registered utility models and continued to roll out these technologies to qualified farmer-beneficiaries and MSMEs.

Similarly, some partnership with Bakehouse in Camiguin focused on technology transfer for banana technologies with Opinion Report (FOR) funding requirement. Meanwhile, the KADIWA sa CMU collaboration supported market visibility for research-based Agriculture, Aquatic, and Natural Resources (AANR)

technologies, providing a retail venue for CMU-developed products.

Research, investment, and market networks. These partnerships collectively demonstrated CMU's and DOST-PCAARRD's ongoing efforts to create a sustainable, innovation-led agribusiness ecosystem across Northern Mindanao. Table 12 presented the summary of ongoing and developing partnerships under the RAISE Project 2 Regional Agribusiness Hub (ABH).

Institutionalize the Regional Agribusiness Hub by embedding enterprise incubation mechanisms into university governance structure

The development and implementation of the Intellectual Property and Technology Business Management (IPTBM) Policy directly supported the projects objective to institutionalize the Regional Agribusiness Hub by providing a strong institutional foundation for the continued operation of the Regional Agribusiness Hub (ABH). The policy established clear guidelines on the creation, ownership, protection, and utilization of intellectual property, ensuring that research outputs generated by the university and its partners were properly managed and commercialized. By formalizing these processes, the policy enhanced the Hub's capacity to transform research and development results into practical, market-ready technologies that could drive agribusiness innovation in the region.

Through the IPTBM Policy, mechanisms for disclosure, evaluation, protection, and technology transfer were institutionalized, creating a structured approach for managing innovations and supporting enterprise creation. This included providing a defined process for handling IP assets, establishing valuation protocols, and facilitating linkages for commercialization or licensing. Such measures ensured that the Hub not only served as a venue for collaboration and enterprise incubation but also as a systematized platform that bridged research and market application. The policy thereby embedded IP management and technology transfer practices into the university's operational framework, ensuring sustainability beyond the project phase.

Moreover, the policy reinforced the collaborative role of the Regional Agribusiness Hub by promoting coordination among research offices, technology transfer units, and partner institutions. This integration enabled the efficient flow of information and resources necessary for supporting pre-commercialization, start-up incubation, and technology-based enterprise development. By institutionalizing these functions, the IPTBM Policy strengthened the Hub's governance structure and ensured that the mechanisms for innovation and commercialization remained active and functional over time.

Ultimately, this contributed to the long-term institutionalization of the Regional Agribusiness Hub as a center for agribusiness development, technology management, and regional economic growth. Table 10 showed the institutionalization of the Regional Agribusiness Hub (ABH). The full details on the institutionalization of the Regional Agribusiness Hub were attached in Appendix 4

CONCLUSION

The project successfully enhanced the regional agribusiness ecosystem in Northern Mindanao by building foundational human capital across Consortium Member Institutions (CMIs). Through structured capacity building initiatives including the Agribusiness Mentorship Series (ABMS), Regional Echo ABMS, and Agri-Entrepreneurship Training, CMI personnel were equipped with crucial skill sets in business model development, financial planning, marketing, and intellectual property valuation. This deliberate investment in staff development created a sustainable cascading effect of knowledge transfer, empowering local institutions to independently mentor regional stakeholders and foster a resilient network capable of driving long-term agribusiness development.

In translating research into tangible economic drivers, the project demonstrated exceptional productivity by exceeding its target outputs with the completion of six business plans, six feasibility studies, six market studies, two IP valuation reports, and three Enterprise Development Plans for key technologies considered in the project. While these outputs successfully paved the way for commercially viable enterprises, they represent only a small fraction of the total R&D inventory available within the CMIs. This gap underscores a critical strategic imperative: conducting a comprehensive policy review of research proposal selection and submission processes to systematically prioritize projects with high commercialization potential from their inception.

To bridge the gap between initial research and market launch, pre-commercialization services were seamlessly integrated with capacity building programs, directly benefiting Consortium Member Institutions. Through technical support such as IP valuations, enterprise plans, and specialized laboratory interventions like shelf-life evaluation and Nutrifacts analysis in partnership with concerned Government agencies, the project meaningfully advanced the product validation and commercial readiness of AANR-based technologies. Complementing these technical interventions, targeted promotional strategies including custom IEC materials and the Regional Agribusiness Hub branding alongside data-driven oversight via the Real-Time Monitoring System (RTMS), ensured high visibility and sustained CMI engagement throughout the implementation phase.

Strategic multi-sectoral partnerships played a pivotal role in linking technical innovations to practical social and economic applications across the region. By forging synergistic collaborations with entities like Bukidnon PRIME, BIDANI, local chambers of commerce, and private enterprises such as Boloc-Boloc Bakehouse, the project successfully expanded market reach and investor linkages. Crucially, these networks did not merely serve commercialization goals; they also addressed pressing community needs, such as integrating nutrient-dense food products into local nutrition and feeding programs to combat malnutrition, thereby aligning technology adoption with inclusive socio-economic growth.

Finally, the long-term sustainability and continuity of these regional efforts were secured through the formal institutionalization of the Regional Agribusiness Hub within Central Mindanao University's (CMU) governance framework via the Intellectual Property and Technology

Business Management (IPTBM) Policy. By establishing a standardized operational policy for IP management, technology transfer, and enterprise incubation, the project transformed temporary grant-funded initiatives into a permanent regional platform for innovation. Coupled with active representation in regional and national events, this policy anchor guarantees that the Hub will continue to drive technology adoption, foster strategic partnerships, and support economic resilience across Northern Mindanao for years to come.

RECOMMENDATION

Based on the accomplishments and learnings of the Regional Agribusiness Hub Project under the RAISE Program, the following recommendations are proposed to strengthen sustainability, scalability, and institutional impact:

1. To sustain and expand the human capital developed under capacity building activity, it is recommended that the CMIs establish a formal, ongoing "Train-the-Trainers" program and a continuous mentoring network. Rather than relying on periodic project-based sessions, CMIs should embed the Agribusiness Mentorship Series (ABMS) modules into their institutional faculty and staff development plans. This will preserve the cascading effect of knowledge transfer, ensuring that newly onboarded CMI staff are regularly trained in business model development, IP valuation, and enterprise management to continuously support local agribusiness entrepreneurs.

2. To address the critical bottleneck where market-ready outputs represented only a fraction of the total R&D inventory, Consortium Member Institutions (CMIs) must urgently conduct a comprehensive policy review of their research selection, funding allocation frameworks, and evaluation guidelines. Specifically, CMIs should revise institutional guidelines for both internal and external proposals to require that prospective researchers explicitly demonstrate commercial intent before approval.

This can be operationalized by introducing a mandatory pre-screening mechanism and commercialization potential rubric at the submission stage, requiring every new proposal to include a preliminary market landscape analysis that identifies potential industry partners, target beneficiaries, and existing competitors. Furthermore, proposal frameworks must incorporate a mandatory Technology Readiness Level (TRL) and Commercialization Readiness Level (CRL) milestone tracker, while technical review scorecards should be adjusted to allocate significant weight to the "Potential for Intellectual Property Generation, Commercialization, and Spin-off Creation." By embedding these market needs, feasibility criteria, and commercialization metrics into upstream R&D priorities from day one, CMIs can effectively narrow the gap between raw research outputs and actionable business plans, ultimately ensuring significantly higher conversion rates of laboratory technologies into viable AANR enterprises.

3. Building on the pre-commercialization interventions in the third objective of the project, it is recommended to

institutionalize formal partnerships with testing and regulatory bodies such as the DOST Regional Standards and Testing Laboratories (RSTL) and the Food and Drug Administration (FDA) to create dedicated support pathways for CMI technologies. Establishing a permanent, streamlined process for shelf-life testing, Nutri-facts analysis, and regulatory compliance will accelerate product validation for institutions needing various mentioned assistance. Furthermore, the Real-Time Monitoring System (RTMS) should be fully integrated across all partner CMIs as a permanent tracking tool for technology readiness levels.

4. To maximize the impact of the industry linkages formed under acquisition of partnership activity, the Regional Agribusiness Hub should transition these multi-sectoral collaborations into formal, long-term Memorandum of Agreements (MOAs) with explicit commercialization pathways. The Hub should deepen engagements with local chambers of commerce, private buyers, and local government units (LGUs) to secure stable off-take agreements for CMI-developed products. Additionally, scaling the integration of bio-fortified and nutrient-dense technologies (like Purple Sweet Potato Flour and Nutri-Chicharon) into LGU feeding programs and institutional feeding initiatives will ensure that market expansion continues to deliver measurable socio-economic and public health benefits.

5. Finally, to guarantee the long-term viability of the institutionalized Regional Agribusiness Hub established under Objective 5, Central Mindanao University (CMU) and partner CMIs must allocate dedicated operational budgets and administrative personnel to enforce the Intellectual Property and Technology Business Management (IPTBM) Policy. The Hub should establish self-sustaining revenue mechanisms—such as licensing fees, technology transfer royalties, and consultation service fees—to fund its ongoing enterprise incubation activities. Active participation in regional and national innovation expos should be maintained as a core operational strategy to keep Northern Mindanao's agribusiness ecosystem visible, competitive, and continuously linked with potential investors

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