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Evaluation of Agribusiness Incubator: The Case of Central Mindanao University Agri-Aqua Technology Business Incubator (CMU-ATBI)

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Abstract

Business incubation is widely acknowledged as a crucial mechanism for economic development and job creation. The Central Mindanao University-Agri-Aqua Technology Business Incubator (CMU-ATBI) project was established to commercialize technologies developed through research at the university. An evaluation study is initiated to determine the impacts of the CMU-ATBI to its beneficiaries known as incubatees. The Organization for Economic Co-operation and Development's (OECD) Development Assistance Committee (DAC) evaluation framework was used in the evaluation. There were 10 CMU-ATBI beneficiaries interviewed for the study who were located in the different municipalities in Bukidnon. The score of the different criteria used suggest that the business support services offered by CMU-ATBI are relevant, effective, efficient, impactful, and sustainable. It highly contributes to over-all development of the respondent's enterprise and this in one way or another contribute to community development.

INTRODUCTION

Agribusiness incubators are essential in developing the technology and value chains that let small agricultural businesses thrive in developing countries and emerging markets (Didoni, A., & Varcando, Ltd., 2020). Business incubators aimed to maximize the chances of success of start-up companies by creating a supportive environment (Stefanovic et.al, 2008).

The CMU-Agri-Aqua Technology Business Incubator is a project funded by the Department of Science and Technology - Philippine Council for Agriculture, Aquatic, and Natural Resources Research and Development (DOST-PCAARRD) under the Agri-Aqua Technology Busineess Incubation (ATBI) Program. The (ATBI) Program aims to support additional incubatees after having already supported a total of 263 businesses. These businesses have collectively generated 1,603 jobs and P68.7 million in revenue for the start-up companies involved (Gueco and Pasang, 2021). It is one of the 16 ATBI's established in 10 regions of the country (Gueco and Pasang, 2021). Focused on accelerating agribusiness practices, CMU-ATBI offers training and mentorship in technology management, agribusiness development, marketing, networking, administrative support, and provides access to facilities and equipment.

The Phase 1 implementation of CMU-ATBI started in August 2018 and since then the center has served around 20 business start-ups and enterprises in different municipalities of Bukidnon. To date, it has been operating for 5 years already which satisfies for an evaluation study.

Despite the growing interest in interventions to accelerate or incubate agribusinesses in emerging and developing markets, there is limited evidence on their effectiveness in attracting additional investments in the sector (Didoni, A., & Varcando, Ltd., 2020) hence, this evaluation answer to this gap.

An impact evaluation relies on rigorous methods to determine the changes in outcomes which can be attributed to a specific intervention based on cause-and-effect analysis. Impact evaluations need to account for the counterfactual – what would have occurred without the intervention through the use of an experimental or quasi-experimental design using comparison and treatment groups (World Bank, No Date).

The primordial intention of this impact evaluation is to assess the performance of the project CMU-Agri-aqua Technology Business Incubator (CMU-ATBI). Specifically, it aimed to assess the project using the evaluation criteria by Organisation for Economic Co-operation and Development

- Development Assistance Committee (OECD-DAC) framework such as relevance, effectiveness, efficiency, impact, and sustainability.

Methodology

Framework of the Study

The Organization for Economic Co-operation and Development's-Development Assistance Committee (OECD-DAC) criteria was used as the evaluation framework (Figure 1). This framework defines five evaluation criteria such as relevance, effectiveness, efficiency, impact, and sustainability. These criteria provide a normative framework used to determine the merit or worth of an intervention (policy, strategy, programme, project or activity). They serve as the basis upon which evaluative judgements are made.

Relevance measures the extent to which the aid activity is suited to the priorities and policies of the target group and recipient. Effectiveness measures the extent to which an aid activity attains its objectives. Efficiency is the extent to which the intervention delivers, or is likely to deliver, results in an economic and timely way. Impact is the extent to which the intervention has generated or is expected to generate significant positive or negative, intended or unintended, higher-level effects. Finally, sustainability dimension is concerned with measuring whether the benefits of an activity are likely to continue after donor funding has been withdrawn.

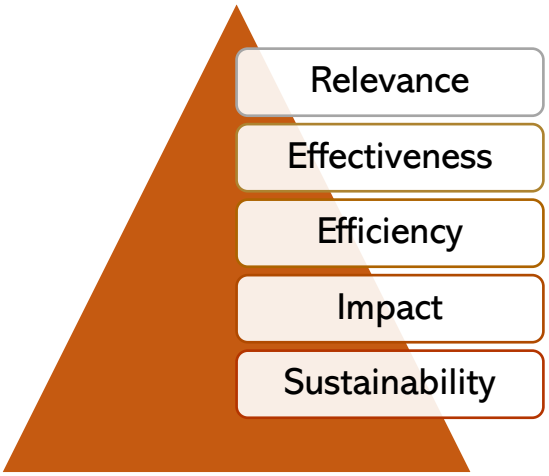

Figure 1. Evaluation Framework of the Study.

There were 10 beneficiaries (called as incubatee) of the project who served as the respondents of the study. They are located in the municipalities of Pangantucan, Quezon, Kibawe, Maramag, Lantapan, Malaybalay City, and Impasug-ong, Bukidnon.

A pre-structured questionnaire was prepared to gather the primary data. The respondents were

visited in their respective residence and the face-to-face interview was conducted. The data were presented in tables and charts and analyzed using descriptive statistics.

Results and Discussion

Description of the Project

The project was funded by DOST-PCAARRD with Central Mindanao University as the implementing agency. It was under the DOST-PCAARRD National Agri-Aqua Technology Business Incubation Program Batch 2. It was implemented from August 1, 2018 to June 30, 2021 with a budget of P5,000.00.

The project developed an operations manual which served as a guide in its operation including service offerings, enrolment procedures, curriculum, and operations policy of the project. The incubation program undertaken by the project was based on the curriculum designed by the incubator.

The project has served twelve (12) incubatees. Three of these are women's organizations, one cooperative, one spin-off, and the rest were individuals. The incubatees are categorized into in-wall and out-wall. In-wall incubatees are those who use the facility of the CMU-ATBI for their production. Out-wall incubatees are those operating in their own areas. Two of the incubatees were in-wall incubatees and the rest were out-wall.

There are different agri-based technologies that were commercialized. One of the technologies is a registered utility model which is an organic fertilizer and the other four technologies were extension technologies such as mushroom production, herb production, meat processing, and vermi-composting.

Relevance

Table 1 shows the score for the criteria relevance on the different services offered by CMU-ATBI. The services offered by CMU-ATBI is summarized in the acronym PEAK which stands for Product commercialization, Enterprise Development, Access to networks, and Knowledge transfer. The items Sales and Marketing, Innovation and Entrepreneurship, Leadership and Management, Financial Management, Operations and Supply Management, Human Resources, Customer Service, Legal and Compliance are the trainings received by the incubatees and they rated these trainings as highly relevant to their needs. The overall relevance of the services is posted at a score of 4.8 which is considered as highly relevant. This implies that services offered by the CMU-ATBI respond to the needs of the incubatees in their enterprise endeavor.

Table 1. Relevance score of CMU-ATBI's services.

Item	Average Score
Level of relevance of the services of CMU-ATBI.	
PRODUCT COMMERCIALIZATION	
• Sales and Marketing	4.9
• Innovation and Entrepreneurship	4.7
ENTERPRISE DEVELOPMENT	
• Leadership and Management	4.9
• Financial Management	4.9
• Operations and Supply Management	4.8
• Human Resources	4.6
• Customer Service	4.6
• Legal and Compliance	4.7
ACCESS TO NETWORKS	
• Access to funding	4.6
• Networking and collaboration opportunities	4.8
KNOWLEDGE TRANSFER	
• Technical Assistance (Training)	4.9
• Mentoring/one on one coaching	4.9
Average	4.8

Effectiveness

Effectiveness enumerates the skills learned and applied by the incubatees from the services offered by the CMU-ATBI. It also captures the effects of the services to their enterprise. Table 2 presents the score for the items which measure the effectiveness of the services offered by CMU-ATBI. The skills enumerated were rated by the incubatees with High Ability including management in the over all operation of the enterprise, record keeping and accounting skills, management of cash flow and prepare their business model canvass among others.

Further, the effectiveness criteria measures the outcomes of the services offered by CMU-ATBI. The items include increased sales/revenue, developed new products, increased my business facilities, hired additional workers/employees, increased the level of my output in terms of volume, and served more clients/customers among others which were rated by the incubatees as Likely to have happened in their enterprise. The over-all average score for the items in effectiveness is posted at 4.4 which implies that the services offered by CMU-ATBI are highly effective.

Table 2. Effectiveness score of CMU-ATBI's services.

Item	Score
1. I can manage well all the operation of my enterprise.	4.8
2. I can perform record-keeping and accounting procedures.	4.2
3. I can manage the flow of cash in my enterprise.	4.5
4. I can prepare my business model canvas.	4.4
5. I can prepare a business plan.	4.2
6. I can conceptualize marketing strategies in my business/enterprise.	4.7

7. I have improved my customer relation.	4.9
8. I can manage the legal aspect of my business.	4.4
9. I can manage well the people I employed.	4.6
10. I can find solutions to problems and challenges in the enterprise.	4.4
The services of CMU-ATBI have:	
1. increased my sales/revenue.	4.9
2. developed new products.	4.7
3. increased my business facilities.	4.5
4. hired additional workers/employees.	4.4
5. increased the level of my output in terms of volume.	4.8
6. served more clients/customers.	4.7
7. applied for IP/patents	4.2
8. government access and private programs for entrepreneurs.	3.4
9. received awards/recognitions.	3.6
10. expand my operation.	4.7
11. additional market outlet through display of product to other incubatees.	4.1
12. responded to my specific need in the enterprise in terms of technology, specific issue or concern in the business, and others.	4.4
Average	4.4

Efficiency

Efficiency measures the optimal use of time, effort, aid and other resources. Table 3 depicts the items under efficiency and its corresponding score. The time allocated in the execution of the training, time allocated for incubatees concern, time for monitoring and site visits, and time allocated for one-on-one coaching were rated by the incubatees in a score of 4 to 5 which were described as (4) most topics were allocated a proper amount of time and (5) all topics were allocated the proper amount of time.

The speakers during the training were also evaluated under the efficiency criteria. The items include the speaker's expertise in giving the selected topics, the trainers feedback during the training, and mentors are updated with the latest trends, research, or developments in their areas of expertise which were rated by the incubatees between 4 to 5 score which were described as High Quality or Very High Quality. The overall efficiency of the CMU-ATBI's services is posted at 4.9 which is described as highly efficient.

Table 3. Efficiency score of the CMU-ATBI's services.

Item	Score
1. Time allocated to the execution of the training.	5.0
2. The time allocated to the training is optimally scheduled and structured.	4.9
3. The time allocated for incubatees concerns.	5.0
4. The time allocated for monitoring and site visits.	4.7
5. The time allocated for one-on-one coaching.	3.6
6. Rate the speaker's expertise in giving the selected topics.	5.0
7. The trainers promptly communicate/seek inputs and feedback during the training.	5.0
8. The mentors are updated with the latest trends, research, or developments in their areas of expertise.	4.9

9.	The services and facilities offered by CMU-ATBI.	4.2
10.	Rate the staff in attending to the needs and concerns of the incubatee.	5.0
	Average	4.9

Impact

Impact describes the contribution of the CMU-ATBI in reaching higher level development objectives. Table 4 presents the items and average score response of the incubatees. The items enumerated here include knowledge and skills enhancement in enterprise development and business management which were rated by the incubatees as with High Contribution and Very High Contribution. Another indicator of impact which should be given emphasize here is the income and job generated by the enterprise as these indicators contribute to economic development. These indicators were rated by the incubatees at an average score of 4.9 and 4.6, respectively which are described as with High Contribution. Finally, over-all impact of the CMU-ATBI is posted at 4.8 which is described as high contribution.

Table 4. Impact score of CMU-ATBI's services.

	Item	Score
1.	The training enhanced knowledge in enterprise development.	4.9
2.	The training enhanced skills in enterprise development.	4.8
3.	The training improved business management.	4.7
4.	Income was increased with knowledge and skills from the services availed in CMU-ATBI.	4.6
5.	Income was increased with access to networks and markets brought by CMU-ATBI.	4.9
6.	The enterprise increases job employment in the community.	4.6
7.	The CMU ATBI opened up new business opportunities.	4.9
8.	More products have become available to consumers.	4.9
9.	The enterprise has contributed to community development.	4.8
10.	Rate the contribution of knowledge sharing among the incubatees.	4.4
11.	Rate the effect of the networking opportunities enabled by CMU-ATBI.	4.8
	Average	4.8

To support the claim on the increase of income among incubatees, Table 5 shows the annual baseline and current income of incubatees 1 year after they enrolled as incubatees. The data is part of the monitoring done by the CMU-ATBI to its incubatees and this is taken from the project's terminal report.

There are incubatees who has a baseline income of 0 that means that they learned the technology from CMU-ATBI and it was then that they started earning income. It can be gleaned from the table that the income of the incubatees increased one year after they enrolled in the program. It can be assumed that the effect in income is in one way or another the impact of the support services extended by the CMU-ATBI to the incubatees.

Further in Table 5 is the jobs generated by the incubatees one year or less after they enrolled in CMU-ATBI. The number implies that these enterprises contribute to community through the provision of jobs in the community they are situated.

Table 5. Baseline and Membership Income of Incubatees and Jobs Generated, June 2023

Name of Company	Technology	Product/s	Baseline	Income Generated	Job Generated
Balugto"HOPE" Agroforestry Association Incorporated	Organic Carrot Production & Mushroom Production & Vermicomposting	Organic carrot, vermicompost & fresh oyster mushroom	0	330,444.00	3
Ki-ohong Mushroom Farm	Mushroom Production	Mushroom Production	75,000	150,000.00	3
Louella's Plant Nursery	Tissue Culture	Banana Lakatan & Cardava suckers & mericlone & Horticultural Crops	501,720.00	2,438,374.00	8
Kabute Farmstead Non-wood Forest Gathering	Mushroom Production	Mushroom Production	260,000.00	438,000.00	7
NaturesBounty Organique Fertilizer Services	Organic Concoction Production & BLack rice production	Black Rice, OHN, CalPhos, FPJ, FFJ, IMO	15,000.00	417,910.00	3
Mugna Leather Works	Leather Arts and Crafts	Wallet, Coin purse, Bags, Belt, Cellphone Case	5,100,000.00	8,427,658.00	20
D'Meter Agri Trading	Hybrid Corn Seed and Soil Enhancer	Hybrid Corn Seed and Soil Enhancer	12,253,000.00	15,390,000.00	18
Bencal's Food Products	Cacao Production and Processing	Cocoa powder, Cocoa butter, Choco-peanut spread, White & Dark chocolates, Sikwate Ready, Lang-ha, Choco-banana chips	120,000.00	240,000.00	3
Sci-App Fabricated Metals Manufacturing	3-D Instructional Apparatus for Vector Operation	3D Vector Operation Device	0	140,000.00	3
AdlayF-Bukidnon	Adlay Production and Processing	Adlai brew & grits	0	250,000.00	2

Source: Project Terminal Report, July 2023.

Sustainability

Sustainability is the ability to maintain or support a process over time. It is concerned with measuring whether the benefits of an activity are likely to continue after donor funding has been withdrawn. Table 5 presents the items which measures the sustainability of the services offered by the CMU-ATBI. The items include the skills learned from the training are still being practiced, training materials and brochures are being used as needed, the opportunities enabled by CMU-ATBI like market access and loan

or grant application will sustain the enterprise in the next 3 to 5 years which were rated by the incubatees as Highly Sustainable.

Table 5. Sustainability score of CMU-ATBI's services.

Item	Score
1. The skills learned from the training are still being practiced.	4.7
2. The training materials and brochures are being used as needed.	4.6
3. The opportunities enabled by CMU-ATBI like market access and loan or grant application will sustain the enterprise in the next 3 to 5 years.	4.1
4. The services availed in CMU-ATBI contribute to the enterprise's sustainability in the next 3-5 years.	4.6
Average	4.9

Over-all Score

Figure 2 illustrates the average score of the different impact assessment criteria of the CMU-ATBI's services. Among the five criteria, efficiency and sustainability has the highest average score of 4.9 while effectiveness got the lowest average score with 4.4. Nevertheless, all of the average scores for the different criteria fall under the description of highly relevant, effective, and efficient. The business support services offered by CMU-ATBI are relevant to the needs of the incubatees. The services offered by the center are effective such that the incubatees were able to practice and apply the knowledge and skills they learned from trainings and coaching and mentoring.

Moreover, the average scores imply that the services of CMU-ATBI have high impact in the incubatees enterprise and highly sustainable. In terms of economic impact, the incubatees has increased their income and employed additional individuals in their enterprise. These are indicators contributory to economic development. In terms of sustainability, the average score implies that the knowledge and skills learned by the incubatees can still be applicable and useful even after the project ended.

Over-all, the figures suggest that the CMU-ATBI plays a significant role in providing business support services among its incubatees and in one way or another contribute to community development.

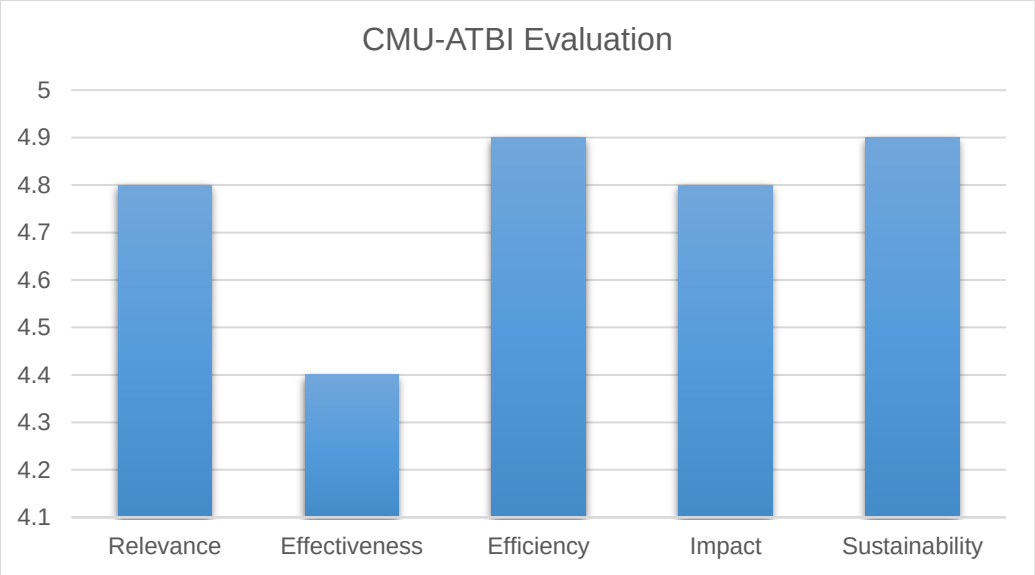

Figure 2. Average scores of the impact evaluation criteria.

Conclusion

In conclusion, the services provided by CMU-ATBI are highly relevant, as indicated by an overall relevance score of 4.8. This suggests that the services effectively address the needs of incubatees in their business ventures. The efficiency of CMU-ATBI's services is also notably high, with an average score of 4.9, reflecting their strong operational effectiveness.

The impact of these services is significant, with an average score of 4.8, highlighting their substantial contribution to key indicators such as increased income and job creation within the enterprises. Additionally, the sustainability of the services is rated at 4.9, indicating that the benefits and support provided are expected to remain valuable and usable for 3 to 5 years or more, even after the conclusion of the project. The scores across various criteria indicate that the business support services provided by CMU-ATBI are relevant, effective, efficient, impactful, and sustainable. These services significantly contribute to the overall development of the respondents' enterprises and, in turn, support broader community development.

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Conflicts of Interest

The author has disclosed no conflicts of interest.

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