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ASSESSMENT ON THE ADOPTION OF LOCAL GOVERNMENT UNITS ON THE DOST COMMUNITY EMPOWERMENT THROUGH SCIENCE AND TECHNOLOGY: A PROPOSAL FOR ENHANCED FUNDING SUSTAINABILITY

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ABSTRACT

This study assesses the effectiveness and impact of the Community Empowerment through Science and Technology (CEST) program, focusing on its contributions to education, health and nutrition, water and sanitation, climate change mitigation, and livelihood. Data from 90 respondents provided insights into the program's outcomes and sustainability.

The findings show that the CEST program has notably improved educational access through digital libraries like STARBOOKS/VISSER and enhanced health and nutrition through community-based initiatives. It has also contributed to better water and sanitation, disaster risk reduction, and livelihood development, fostering economic growth and community well-being. The active participation of local government units (LGUs) was crucial to the program's success, ensuring effective coordination and service delivery.

Government funding was the most significant factor in the program's success, while private sector involvement played a lesser role. Technical skills development and local engagement were strongly correlated with successful outcomes.

The study concludes that sustained government investment, enhanced community participation, and stronger capacity-building are vital for expanding and ensuring the program's future success. Recommendations include strengthening public-private partnerships, improving community engagement, and enhancing monitoring and evaluation frameworks.

KEYWORDS: *CEST, LGUs, Sustainability, Capacity Building, Livelihood*

INTRODUCTION

Local Government Units (LGUs) in the Philippines face growing demands to address sustainable development, poverty alleviation, environmental conservation, and climate resilience. According to Carino (2019), LGUs play a critical role in addressing these challenges at the grassroots level, as they are directly responsible for implementing programs that impact local communities. To support LGUs in these efforts, the Department of Science and Technology (DOST) has implemented the Community Empowerment through Science and Technology (CEST) program, which aims to empower communities through science-based solutions. The CEST program promotes innovation, technical know-how, and collaborative partnerships between LGUs and local stakeholders, which are essential for driving socio-economic development (DOST, 2018).

The success of CEST, however, largely depends on the level of adoption by LGUs, the availability and sources of funding, training, and the engagement of the local community. The program's impact on community development, sustainability, and LGU performance varies by locality, particularly in the province of Laguna. Factors such as LGU participation, access to government and private sector funding, and community involvement in planning and implementation all contribute to CEST's effectiveness (Bautista & Serrano, 2020). This study explores the adoption of CEST programs by LGUs, focusing on the role of funding mechanisms, the importance of training, and community engagement.

MATERIALS AND METHODS

This study employed a quantitative research design utilizing both descriptive and correlational approaches to examine the level of adoption, administration, and performance of Local Government Units (LGUs) in implementing the Community Empowerment through Science and Technology (CEST) program. The descriptive design allowed for a comprehensive analysis of the current status of CEST implementation, focusing on funding mechanisms, training and capacity building, and community engagement, as these are vital components for understanding program dynamics (Burns & Grove, 2010). The correlational approach was used to explore the relationships between independent variables (adoption, funding mechanisms, training, and community engagement) and dependent variables (sustainability outcomes, project effectiveness, and LGU performance), helping to identify significant associations that may inform policy and strategic improvements (Cohen, Manion, & Morrison, 2007).

The study utilized purposive sampling to select key respondents involved with the CEST program, including five LGU officials, five CEST implementers, and twenty community leaders or beneficiaries from Mabitac, Pakil, and Santa Maria, Laguna. This sampling method ensured the inclusion of participants with direct knowledge and experience in program implementation, allowing for a rich understanding of the program's impact and challenges (Creswell, 2014; Patton, 2015).

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Data were collected through a structured survey questionnaire that covered several aspects of the CEST program, including funding mechanisms, training, community engagement, and LGU performance. The questionnaire was tested for reliability using Cronbach's alpha, with results ranging from .94 to 1.00, indicating excellent reliability of the instrument (George & Mallery, 2003). The data collection process involved online surveys, and face-to-face interviews, depending on accessibility and restrictions (Sieber & Tolich, 2013; Trochim, 2006).

The findings of this study provide a comprehensive understanding of CEST program adoption, revealing the importance of funding mechanisms, training, and community engagement in ensuring program success and sustainability. The integration of descriptive and correlational approaches allowed for a thorough exploration of the program's dynamics and the identification of factors that contribute to local development outcomes. The study's methodology, including the reliable survey instrument and purposive sampling, strengthens the credibility of the results and their implications for improving CEST program implementation.

RESULTS AND DISCUSSION

Table 1. Level of Adoption of CEST Funding Mechanisms in terms of Government Grants.

Indicator	*M*	*SD*	Interpretation
1. The DOST and LGU receive sufficient government grants to support the full implementation of CEST programs.	3.76	0.43	VH
2. Government grants for CEST programs are provided on time to ensure smooth implementation of activities.	3.70	0.46	VH
3. The government consistently provide grants for CEST programs annually, ensuring continuity.	3.71	0.46	VH
4. Government grants adequately meet the community's financial needs in implementing CEST programs effectively.	3.66	0.48	VH
5. The availability of government grants has significantly impacted the success and sustainability of CEST programs.	3.70	0.46	VH
Overall Mean	3.70		VH

Legend: N = 90*. This mean is interpreted as follows: 3.26-4.00 = Very High (VH), 2.51-3.25 = High (H), 1.76-2.50 = Low (L), 1.00-1.75 = Very Low (VL).*

Table 1 presents the level of adoption of the Community Empowerment through Science and Technology (CEST) program by Local Government Units (LGUs), focusing on respondents' perceptions of the adequacy, timeliness, and consistency of government grants. The findings indicate that respondents strongly agree that the Department of Science and Technology (DOST) and LGUs receive sufficient government grants to effectively implement CEST programs (M = 3.76, SD = 0.43). This suggests that funding is not a significant constraint, enabling efficient program execution, sustainability, and achievement of community development goals. Additionally, respondents noted that the government consistently provides annual grants, ensuring the continuity of CEST programs without major disruptions (M = 3.71, SD = 0.46). This reflects the government's financial commitment, reducing the risks of funding shortages and operational delays.

The overall mean score of 3.70, classified as Very High (VH), highlights strong consensus among respondents that government grants are critical to the success, stability, and sustainability of CEST programs. This finding underscores the importance of well-managed, reliable funding mechanisms that are perceived as adequate, timely, and impactful in supporting the operational and long-term objectives of the program.

Table 2. Level of Adoption of CEST Funding Mechanisms in terms of Private Sector Partnership

Indicator	*M*	*SD*	Interpretation
1. The DOST and LGU has strong partnerships with private sector organizations to fund and support implementing CEST programs.	3.31	0.66	VH
2. The private sector provides significant financial or in-kind contributions to CEST programs within the LGU/Community.	3.22	0.63	H
3. Collaboration between the DOST, LGU, and the private sector has contributed to the long-term sustainability of CEST programs.	*3.31*	*0.66*	*VH*
4. Private sector partners are actively involved in the planning and development of CEST programs.	3.26	0.66	VH
5. The private sector partnerships have effectively addressed the resource gaps in implementing CEST programs.	3.27	0.65	VH
Overall Mean	3.27		VH

Legend: N = 90*. This mean is interpreted as follows: 3.26-4.00 = Very High (VH), 2.51-3.25 = High (H), 1.76-2.50 = Low (L), 1.00-1.75 = Very Low (VL).*

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Table 2 presents the level of adoption of the Community Empowerment through Science and Technology (CEST) program by Local Government Units (LGUs), focusing on respondents' perceptions of the adequacy, timeliness, and consistency of private sector partnerships. The findings indicate strong agreement that the Department of Science and Technology (DOST) and LGUs have established effective partnerships with private sector organizations, which contribute to funding and supporting the implementation of CEST programs (*M* = 3.31, *SD* = 0.66). This suggests that private sector partnerships alleviate funding constraints, allowing for the smooth execution, sustainability, and achievement of community development goals. Respondents also highlighted that private sector organizations effectively address resource gaps in CEST program implementation (*M* = 3.27, *SD* = 0.65), underscoring the significant financial and logistical support provided.

The overall mean score of 3.27, classified as Very High (VH), reflects a strong consensus that private sector partnerships are crucial for the success, stability, and sustainability of CEST programs. This finding emphasizes the importance of reliable, well-managed collaborations with private sector stakeholders to ensure the efficient operation and long-term viability of the programs.

Table 3. Level of Adoption of CEST Funding Mechanisms in terms of Community Contribution

Indicator	*M*	*SD*	Interpretation
1. The community actively contributes financially to support implementing CEST programs in the LGU/Community.	3.58	0.56	VH
2. The community provides in-kind contributions, such as materials, labor, or expertise, to help implement CEST programs.	3.59	0.56	VH
3. Community members volunteer their time and effort to support various activities under the CEST program.	3.64	0.57	VH
4. The community takes ownership and responsibility for the success and sustainability of CEST programs.	3.66	0.48	VH
5. The community is actively involved in mobilizing resources, both financial and non-financial, to support CEST programs.	3.67	0.47	VH
Overall Mean	3.63		VH

Legend: N = 90*. This mean is interpreted as follows: 3.26-4.00 = Very High (VH), 2.51-3.25 = High (H), 1.76-2.50 = Low (L), 1.00-1.75 = Very Low (VL).*

Table 3 presents the level of adoption of the Community Empowerment through Science and Technology (CEST) program by Local Government Units (LGUs), focusing on respondents' perceptions of the adequacy, timeliness, and consistency of community contributions. The findings indicate strong agreement that the Department of Science and Technology (DOST) and LGUs receive financial support from the community, with a mean score of 3.58 (*SD* = 0.56). This suggests that community contributions are not a significant constraint, enabling efficient program execution and sustainability. Additionally, respondents reported that the community actively mobilizes both financial and non-financial resources to support the program (*M* = 3.67, *SD* = 0.47), reflecting strong community commitment and reducing operational delays.

The overall mean score of 3.63, categorized as Very High (VH), highlights the critical role that community contributions play in ensuring the successful implementation, stability, and sustainability of CEST programs. This finding underscores the importance of timely and adequate funding mechanisms, which are essential for the long-term viability of the initiatives.

Table 4. Composite table for the Level of Adoption of the CEST program in terms of funding mechanism

Indicator	Mean	Interpretation
Government Grants	3.70	Very High
Private Sector Partnership	3.27	Very High
Community Contribution	3.63	Very High
Overall Mean	3.53	Very High

Legend: N = 90*. This mean is interpreted as follows: 3.26-4.00 = Very High (VH), 2.51-3.25 = High (H), 1.76-2.50 = Low (L), 1.00-1.75 = Very Low (VL).*

The composite table presents the level of adoption of the Community Empowerment through Science and Technology (CEST) program's funding mechanisms, which include government grants, private sector partnerships, and community contributions. The overall mean score of 3.53, classified as Very High (VH), reflects a strong consensus that these funding sources are critical to the program's success, sustainability, and impact.

Government grants received the highest mean score (*M* = 3.70), indicating strong confidence in their adequacy and timeliness. Private sector partnerships were rated Very High (*M* = 3.27), indicating that these partnerships provide valuable resources,

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innovation, and technical expertise. Community contributions (*M* = 3.63) also received strong ratings, reflecting active grassroots support. Communities contribute labor and materials, which promotes local ownership, accountability, and program continuity. This involvement fosters civic engagement and resilience, ensuring that the program remains relevant and sustainable at the local level.

Table 5. Level of Adoption of CEST Training and Capacity Building Performance in terms of Technical Skills Training

Indicator	*M*	*SD*	Interpretation
1. The DOST and LGU provides adequate technical skills training to staff and community members to implement CEST programs effectively.	3.62	0.49	VH
2. The technical skills training offered by the DOST and LGU is highly relevant to the specific needs of CEST program implementation.	3.68	0.47	VH
3. The DOST and LGU regularly conduct technical skills training to ensure continuous improvement in the capacity of staff and community members.	3.60	0.49	VH
4. The technical skills training provided has been effective in enhancing the ability of staff and community members to manage and implement CEST programs.	3.63	0.48	VH
5. The DOST and LGU ensures that staff and community members receive ongoing technical support and training to keep up with new developments and needs related to CEST programs.	3.60	0.56	VH
Overall Mean	3.63		VH

Legend: N = 90*. This mean is interpreted as follows: 3.26-4.00 = Very High (VH), 2.51-3.25 = High (H), 1.76-2.50 = Low (L), 1.00-1.75 = Very Low (VL).*

Table 5 presents the level of adoption of the Community Empowerment through Science and Technology (CEST) program by Local Government Units (LGUs), focusing on respondents' perceptions of the adequacy, relevance, and effectiveness of technical skills training provided by the Department of Science and Technology (DOST) and LGUs.

The findings reveal that respondents strongly agree that DOST and LGUs provide adequate technical skills training to staff and community members, ensuring the effective implementation of CEST programs (*M* = 3.62, *SD* = 0.49). This indicates that training initiatives are well-supported and effectively meet the needs of beneficiaries, contributing to the success and efficiency of CEST programs. Respondents also emphasized that technical skills training is highly relevant to the specific needs of CEST program implementation (*M* = 3.68, *SD* = 0.47), ensuring that the training is closely aligned with program requirements. Regularly conducted training sessions (*M* = 3.60, *SD* = 0.49) help maintain continuous improvement in the capacity of both staff and community members, fostering adaptability and competence in managing and implementing CEST initiatives.

Additionally, respondents affirmed that the technical training has successfully enhanced the skills of staff and community members, enabling them to manage and implement CEST programs effectively (*M* = 3.63, *SD* = 0.48). The ongoing commitment of DOST and LGUs to provide technical support and training (*M* = 3.60, *SD* = 0.56) ensures that beneficiaries remain informed about new developments and emerging needs related to the CEST program.

The overall mean score of 3.63, categorized as Very High (VH), indicates a strong consensus that technical skills training is a crucial and well-implemented component of the CEST program's capacity-building efforts. This highlights the importance of sustained technical training and support in improving the operational effectiveness and long-term success of CEST initiatives. The high ratings suggest that the training provided is timely, practical, and responsive to the actual needs of program beneficiaries.

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Table 6. Level of Adoption of CEST Training and Capacity Building Performance in terms of Community Skills Training

Indicator	*M*	*SD*	Interpretation
1. The DOST and LGU conduct sufficient community skills training to ensure that community members can effectively contribute to the success of CEST programs.	3.58	0.50	VH
2. The community skills training programs align with the specific needs and objectives of the CEST program in the local context.	3.56	0.50	VH
3. Many community members actively participate in the community skills training programs organized by the LGU.	3.56	0.50	VH
4. Community skills training has positively impacted the effectiveness and success of CEST programs, particularly in terms of community involvement and participation.	3.56	0.50	VH
5. The community skills training programs have equipped community members with long-term skills that contribute to the sustainability of CEST programs.	3.57	0.50	VH
Overall Mean	3.56		VH

Legend: N = 90*. This mean is interpreted as follows: 3.26-4.00 = Very High (VH), 2.51-3.25 = High (H), 1.76-2.50 = Low (L), 1.00-1.75 = Very Low (VL).*

Table 6 presents the level of adoption of the Community Empowerment through Science and Technology (CEST) program by Local Government Units (LGUs), specifically assessing respondents' perceptions of the adequacy, relevance, and effectiveness of community skills training provided by the Department of Science and Technology (DOST) and LGUs.

The findings indicate that respondents strongly agree that DOST and LGUs provide adequate community skills training to staff and community members, ensuring the effective implementation of CEST programs (*M* = 3.58, *SD* = 0.50). This suggests that the training initiatives are well-supported and align with the needs of beneficiaries, contributing to the overall success of the programs. Additionally, respondents acknowledged that the community skills training programs are tailored to the specific needs and objectives of the CEST program in the local context (*M* = 3.56, *SD* = 0.50). The regular conduct of these training programs (*M* = 3.57, *SD* = 0.50) has equipped both staff and community members with long-term skills, enhancing the sustainability of CEST initiatives.

Respondents also noted that community skills training positively impacted the effectiveness and success of CEST programs, particularly in fostering community involvement and participation (*M* = 3.56, *SD* = 0.50). Furthermore, they affirmed that DOST and LGUs have played a crucial role in organizing these training programs, ensuring that community members remain updated on new developments and emerging needs related to CEST (M = 3.56, *SD* = 0.50).

The overall mean score of 3.56, categorized as Very High, reflects a strong consensus that community skills training is an essential and well-executed component of CEST's capacity-building efforts. This emphasizes the importance of ongoing training, technical support, and skills development to sustain and improve the effectiveness of CEST programs.

Table 7. Level of Adoption of the CEST program in terms of Training and Capability Building Performance

Indicator	Mean	Interpretation
Technical Skills Training	3.63	Very High
Community Skills Training	3.56	Very High
Overall Mean	3.60	Very High

Legend: N = 90*. This mean is interpreted as follows: 3.26-4.00 = Very High (VH), 2.51-3.25 = High (H), 1.76-2.50 = Low (L), 1.00-1.75 = Very Low (VL).*

The composite table presents respondents' perceptions of the adequacy, relevance, and effectiveness of the Community Empowerment through Science and Technology (CEST) program's training and capability-building initiatives, specifically focusing on technical and community skills training. Both dimensions received Very High (VH) ratings, with an overall mean score of 3.60, indicating a strong and consistent level of adoption and perceived effectiveness.

Technical skills training, with a mean score of 3.63, was viewed as highly relevant and well-aligned with the operational needs of CEST projects. Respondents highlighted that the training sessions organized by the Department of Science and Technology (DOST) and Local Government Units (LGUs) were frequent, structured, and responsive to the needs of both the community and staff. However, minor variations in responses indicate some disparities in access, suggesting the need for more inclusive delivery of training across different regions.

Community skills training, with a slightly lower mean score of 3.56, also received a Very High rating and was perceived as having a significant impact on fostering local participation and cultivating practical skills. Respondents noted that this training promoted stronger community engagement, which is essential for project sustainability and long-term success.

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Table 8. Level of Adoption of CEST on Community Engagement in terms of Involvement

Indicator	*M*	*SD*	Interpretation
1. Community members are actively involved in CEST programs' design and planning stages, providing input that shapes the programs' goals and activities.	3.60	0.51	VH
2. There is effective collaboration between community members, LGU officials, and DOST during the planning stages of CEST programs.	3.64	0.48	VH
3. The planning process of CEST programs reflects the actual needs and priorities of the community as expressed by community members.	3.64	0.48	VH
4. The planning stages of CEST programs are inclusive, ensuring that all relevant community sectors (e.g., women, youth, elders) are represented and heard.	3.63	0.51	VH
5. The plans for CEST programs are effectively communicated to the community, allowing members to understand and contribute to the decision-making process.	3.68	0.47	VH
Overall Mean	3.64		VH

Legend: N = 90*. This mean is interpreted as follows: 3.26-4.00 = Very High (VH), 2.51-3.25 = High (H), 1.76-2.50 = Low (L), 1.00-1.75 = Very Low (VL).*

Table 8 presents the level of adoption of the Community Empowerment through Science and Technology (CEST) program by Local Government Units (LGUs), focusing on respondents' perceptions of the adequacy, relevance, and effectiveness of community engagement in the design and planning stages. The findings indicate that respondents strongly agree that community members are actively involved in shaping the programs' goals and activities during the design and planning phases (*M* = 3.60, *SD* = 0.51). This demonstrates that community involvement is integral to the program's development and decision-making processes, contributing to the alignment of CEST projects with local needs.

The overall mean score of 3.64, classified as Very High, reflects strong consensus regarding the importance of community involvement for the success of CEST programs. High levels of participation in shaping project goals emphasize the program's ability to foster meaningful dialogue and engagement between local members and program implementers. However, some response variability suggests that certain communities may face barriers to consistent engagement, potentially due to logistical or socio-cultural factors. To address this, the Department of Science and Technology (DOST) and LGUs should prioritize improving inclusivity, particularly in underserved areas, and ensure participation from diverse sectors such as women, youth, and Indigenous groups.

Table 9. Level of Adoption of CEST on Community Engagement in terms of Participation

Indicator	*M*	*SD*	Interpretation
1. Community members actively contribute to implementing CEST programs by participating in activities such as construction, organizing events, and other tasks.	3.67	0.47	VH
2. Community members are given leadership roles during the implementation of CEST programs, ensuring that they directly impact the program's success.	3.67	0.47	VH
3. Many community members volunteer their time and effort in implementing CEST programs, demonstrating a strong sense of commitment and responsibility.	3.63	0.51	VH
4. Community members actively mobilize resources (e.g., funds, materials, labor) to effectively implement CEST programs.	3.63	0.51	VH
5. Community members' participation in implementing CEST programs is consistent and sustained throughout the program's duration.	3.63	0.51	VH
Overall Mean	3.65		VH

Legend: N = 90*. This mean is interpreted as follows: 3.26-4.00 = Very High (VH), 2.51-3.25 = High (H), 1.76-2.50 = Low (L), 1.00-1.75 = Very Low (VL).*

Table 9 presents the level of adoption of the Community Empowerment through Science and Technology (CEST) program by Local Government Units (LGUs), focusing on respondents' perceptions of community engagement in terms of adequacy, relevance, and effectiveness. The findings indicate that respondents strongly agree that community members actively contribute to the implementation of CEST programs, with a mean score of 3.67 (*SD* = 0.47). This suggests that community participation is robust, including involvement in activities such as construction, event organization, and other tasks essential for program success. Additionally, respondents acknowledged that community members are given leadership roles during the implementation of CEST programs, further ensuring that they have a direct impact on the program's outcomes (*M* = 3.67, *SD* = 0.47). Furthermore, respondents noted that community members volunteer their time and effort to implement the programs (*M* = 3.63, *SD* = 0.51), demonstrating strong commitment and responsibility.

Respondents also affirmed that community members actively mobilize resources, including funds, materials, and labor, to support the effective implementation of CEST programs (*M* =

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3.63, *SD* = 0.51). Moreover, participation is sustained throughout the program's duration, indicating ongoing community engagement (*M* = 3.63, *SD* = 0.51). The overall mean score of 3.65, classified as Very High, reflects a strong consensus that community participation is a vital and well-executed component of the CEST program, contributing to its sustainability and effectiveness.

Table 10. Level of Adoption of the CEST Program in Community Engagement.

Indicator	Mean	Interpretation
Involvement	3.64	Very High
Participation	3.65	Very High
Overall Mean	3.65	Very High

Legend: N = 90*. This mean is interpreted as follows: 3.26-4.00 = Very High (VH), 2.51-3.25 = High (H), 1.76-2.50 = Low (L), 1.00-1.75 = Very Low (VL).*

The composite table illustrates the level of adoption of the Community Empowerment through Science and Technology (CEST) program in terms of community engagement, assessed through the indicators of involvement and participation. Both aspects received Very High (VH) ratings, with an overall mean score of 3.65, indicating strong and consistent community engagement across the surveyed population. Community involvement, with a mean score of 3.64, reflects active participation of community members during the design and planning phases of CEST projects. Respondents confirmed that collaboration among community stakeholders, the Department of Science and Technology (DOST), and Local Government Units (LGUs) is effective and inclusive, ensuring the planning process aligns with local needs and context. Emphasis on including marginalized groups such as women, youth, and elders further promotes an equitable planning approach, supported by transparent communication channels that enhance shared decision-making.

Community participation, with a slightly higher mean of 3.65, indicates that engagement extends beyond planning into implementation. Community members actively participate in project activities and assume leadership roles. Their contributions include volunteering time and labor and mobilizing resources such as materials and funds, demonstrating a deep commitment to the success of CEST initiatives. The sustained nature of this involvement throughout program implementation signifies strong ownership and a shared sense of responsibility.

With an overall mean score of 3.65, interpreted as Very High, the findings highlight that community engagement within CEST is perceived as highly effective and sustainable. This underscores the importance of community involvement in both the planning and implementation phases, fostering ownership and reinforcing participatory governance. However, slight variations in standard deviation scores suggest that full engagement may be limited in some communities due to logistical constraints, insufficient information dissemination, or varying levels of readiness. These challenges point to the need for DOST and LGUs to enhance outreach efforts and adopt context-specific engagement strategies that cater to diverse community profiles.

Table 11. ***Level of CEST Project in terms of Education***

Indicator	*M*	*SD*	Interpretation
1. The implementation of STARBOOKS/VISSER in the community has been successful and widely used.	3.68	0.47	VH
2. STARBOOKS/VISSER has significantly improved educational outcomes for the community.	3.69	0.47	VH
3. Community members have easy access to STARBOOKS/VISSER for learning and development.	3.69	0.47	VH
4. The DOST and LGU provides adequate training to community members on how to use STARBOOKS/VISSER effectively.	3.70	0.46	VH
5. The STARBOOKS/VISSER is sustainable and can continue to serve the community over the long term.	3.69	0.47	VH
Overall Mean	3.69		VH

Legend: N = 90*. This mean is interpreted as follows: 3.26-4.00 = Very High (VH), 2.51-3.25 = High (H), 1.76-2.50 = Low (L), 1.00-1.75 = Very Low (VL).*

Table 11 presents the level of implementation of the Community Empowerment through Science and Technology (CEST) program in the area of education, specifically evaluating the accessibility, effectiveness, and sustainability of STARBOOKS/VISSER, a digital library and learning resource developed by the Department of Science and Technology (DOST). The data reveal that respondents strongly agree that STARBOOKS/VISSER has been successfully integrated into the community and is widely used (*M*

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= 3.68, *SD* = 0.47), indicating its value as an educational tool. Additionally, respondents acknowledged that the digital resource has significantly improved educational outcomes (*M* = 3.69, *SD* = 0.47), demonstrating its positive impact on learning opportunities and access to educational materials. Community access to STARBOOKS/VISSER for learning and development is also high (*M* = 3.69, *SD* = 0.47), ensuring that the resource is readily available to those who need it. Furthermore, respondents affirmed that DOST and LGUs provide adequate training to ensure the effective use of STARBOOKS/VISSER (*M* = 3.70, *SD* = 0.46), supporting the maximization of its benefits. Respondents also expressed confidence in the long-term sustainability of STARBOOKS/VISSER (*M* = 3.69, *SD* = 0.47), suggesting that it will continue to serve the community in the future. The overall mean score of 3.69, categorized as Very High (VH), reflects respondents' strong perception that STARBOOKS/VISSER is a practical, accessible, and sustainable tool that significantly contributes to community learning.

Table 12. Level of CEST Project in terms of Health and Nutrition

Indicator	*M*	*SD*	Interpretation
1. The health and nutrition programs implemented through CEST have led to improved health outcomes in the community.	3.71	0.46	VH
2. Health and nutrition programs are accessible to all members of the community.	3.72	0.45	VH
3. Health workers receive sufficient training to effectively implement health and nutrition programs.	3.71	0.46	VH
4. The health and nutrition programs under CEST are sustainable and will continue to benefit the community.	3.73	0.44	VH
5. The community actively participates in health and nutrition programs organized by the DOST and LGU.	3.72	0.45	VH
Overall Mean	3.72		VH

Legend: N = 90*. This mean is interpreted as follows: 3.26-4.00 = Very High (VH), 2.51-3.25 = High (H), 1.76-2.50 = Low (L), 1.00-1.75 = Very Low (VL).*

Table 12 presents the level of implementation of the Community Empowerment through Science and Technology (CEST) program in the area of health and nutrition, focusing on various initiatives such as DOST Pinoy training for Barangay Nutrition Scholars, Dengue Aqua kits, Weighing Scale Calibration, and the distribution of complimentary food items like e-Nutribun, Crunchies, and Rice and Mongo technologies. The findings indicate that respondents strongly agree that these health and nutrition projects have significantly improved community health outcomes (*M* = 3.71, *SD* = 0.46). This suggests that the CEST health and nutrition initiatives are effectively addressing the community's needs. Respondents also noted that these programs are accessible to all members of the community (*M* = 3.72, *SD* = 0.45), ensuring inclusivity in health services. Moreover, the health workers received adequate training to implement these programs effectively (*M* = 3.71, *SD* = 0.46). Respondents affirmed that the programs are sustainable and will continue benefiting the community (*M* = 3.73, *SD* = 0.44). Additionally, community participation in these programs was significant (*M* = 3.72, *SD* = 0.45), reflecting the collaborative efforts between DOST, LGUs, and community members. The overall mean score of 3.72, classified as Very High (VH), suggests that respondents perceive the health and nutrition interventions as practical, accessible, sustainable, and highly beneficial to the community.

Table 13. Level of CEST Project in terms of Water and Sanitation

Indicator	*M*	*SD*	Interpretation
1. The DOST and LGU provides sufficient water and sanitation services to meet community needs.	3.70	0.46	VH
2. Water and sanitation projects under CEST have improved the quality of water in the community.	3.70	0.46	VH
3. Community members actively participate in the management and maintenance of water and sanitation projects.	3.71	0.46	VH
4. The water and sanitation projects funded by CEST are sustainable in the long term.	3.70	0.46	VH
5. The water and sanitation projects have contributed to improved health outcomes in the community.	3.69	0.47	VH
Overall Mean	3.70		VH

Legend: N = 90*. This mean is interpreted as follows: 3.26-4.00 = Very High (VH), 2.51-3.25 = High (H), 1.76-2.50 = Low (L), 1.00-1.75 = Very Low (VL).*

Table 13 presents the level of implementation of the Community Empowerment through Science and Technology (CEST) program in the area of water and sanitation, focusing on the accessibility, effectiveness, and sustainability of water testing for public water source services provided by the Department of Science and Technology (DOST). The findings reveal that respondents strongly agree that the DOST and Local Government Units (LGUs) provide adequate water and sanitation services that meet community needs (*M* = 3.70, *SD* = 0.46), indicating that the program has been effective in addressing the essential needs of

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the community. Additionally, respondents acknowledged that the water and sanitation projects under CEST have significantly improved the quality of water sources in the community (*M* = 3.70, *SD* = 0.46). Community participation in managing and maintaining these projects was also strongly affirmed (*M* = 3.71, *SD* = 0.46), emphasizing the collaborative nature of the initiatives. Furthermore, the sustainability of these projects was ensured through adequate funding (*M* = 3.70, *SD* = 0.46). The program's success in improving public health outcomes through enhanced sanitation (M = 3.69, *SD* = 0.47) was also noted. With an overall mean score of 3.70, classified as Very High (VH), the findings suggest that the CEST program's water and sanitation initiatives are practical, accessible, sustainable, and effectively meet community needs.

Table 14. Level of CEST Project in terms of Disaster Risk Reduction and Climate Change Adaptation.

Indicator	*M*	*SD*	Interpretation
1. The LGU's disaster risk reduction programs have significantly enhanced the resilience of our community.	3.71	0.46	VH
2. The LGU has effectively integrated climate change mitigation equipment and systems.	3.70	0.46	VH
3. The DOST and LGU-initiated CEST programs have successfully reduced disaster risks in vulnerable areas.	3.69	0.47	VH
4. The LGU's disaster risk reduction and climate change mitigation programs are well-aligned with the community's needs.	3.70	0.46	VH
5. Collaboration between the DOST, LGU, and stakeholders has improved the sustainability of disaster risk reduction initiatives.	3.69	0.47	VH
Overall Mean	3.70		VH

Legend: N = 90*. This mean is interpreted as follows: 3.26-4.00 = Very High (VH), 2.51-3.25 = High (H), 1.76-2.50 = Low (L), 1.00-1.75 = Very Low (VL).*

Table 14 presents the level of implementation of the Community Empowerment through Science and Technology (CEST) program in disaster risk reduction and climate change adaptation, focusing on respondents' perceptions of the accessibility, effectiveness, and sustainability of the Automated Rain Gauge (ARG) and Local Government Unit Information Dissemination System (LGUIDS) developed by the Department of Science and Technology (DOST). The findings indicate strong community support for the program, with an overall mean score of 3.70, categorized as Very High (VH), reflecting the significant impact of these initiatives on community resilience. Respondents strongly agreed that the disaster risk reduction programs have substantially enhanced the community's ability to withstand and recover from disasters (*M* = 3.71). Additionally, the integration of climate change adaptation equipment and systems by LGUs was also highly rated (*M* = 3.70), demonstrating the effectiveness of these initiatives in addressing climate change challenges. Furthermore, the CEST programs were perceived as successful in reducing disaster risks in vulnerable areas (*M* = 3.69) and well-aligned with the community's needs (*M* = 3.70). The importance of collaboration between DOST, LGUs, and other stakeholders in sustaining these programs was emphasized, with respondents noting that such partnerships are crucial for ensuring the long-term effectiveness of the disaster risk reduction efforts (*M* = 3.69).

Table 15. Level of CEST Project in terms of Livelihood

Indicator	*M*	*SD*	Interpretation
1. The DOST and LGU's CEST Program livelihood have had a positive socio-economic impact on the community.	3.74	0.44	VH
2. The DOST and LGU's CEST Program livelihood effectively addresses the economic challenges faced by vulnerable populations.	3.71	0.46	VH
3. Community participation has played a significant role in the success of the DOST and LGU's CEST livelihood projects.	3.72	0.45	VH
4. The DOST and LGU's CEST livelihood projects have contributed to a reduction in unemployment in our area.	3.73	0.44	VH
5. The DOST and LGU have effectively overcome challenges in implementing livelihood programs under the CEST initiative.	3.72	0.45	VH
Overall Mean	3.73		VH

Legend: N = 90*. This mean is interpreted as follows: 3.26-4.00 = Very High (VH), 2.51-3.25 = High (H), 1.76-2.50 = Low (L), 1.00-1.75 = Very Low (VL).*

Table 15 presents the assessment of the Community Empowerment through Science and Technology (CEST) program's livelihood component, based on respondents' perceptions, highlighting its positive socio-economic impact on the community. With an overall mean score of 3.73, categorized as Very High, the findings reflect strong support for the

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program's effectiveness in addressing economic challenges, particularly for vulnerable populations. Respondents strongly agreed that the CEST livelihood initiatives have improved community economic well-being (*M* = 3.74) and helped reduce unemployment by creating local job opportunities (*M* = 3.73). The role of community participation in the success of these projects was also emphasized (*M* = 3.72), showing the importance of local involvement in achieving sustainable outcomes. Additionally, the program has effectively tackled challenges in implementation (*M* = 3.72), further enhancing its success.

Table 16. Level of administration of the CEST project on community development as assessed by the LGUs.

Indicator	Mean	Interpretation
Education	3.69	Very High
Health and Nutrition	3.72	Very High
Water and Sanitation	3.70	Very High
DRRMCA	3.70	Very High
Livelihood	3.73	Very High
Overall Mean	3.71	Very High

Legend: N = 90*. This mean is interpreted as follows: 3.26-4.00 = Very High (VH), 2.51-3.25 = High (H), 1.76-2.50 = Low (L), 1.00-1.75 = Very Low (VL).*

The composite table presents the assessment of the administrative performance of the Community Empowerment through Science and Technology (CEST) program across five key sectors Education, Health and Nutrition, Water and Sanitation, Disaster Risk Reduction and Climate Change Adaptation (DRRMCA), and Livelihood reveals a strong and comprehensive impact, with an overall mean score of 3.71, indicating Very High (VH) performance. The Education sector (*M* = 3.69) has benefited from digital innovations like STARBOOKS and VISSER, which provide accessible science-based materials, especially in underserved areas, enhancing science literacy and student engagement in STEM. In Health and Nutrition (*M* = 3.72), programs such as DOST Pinoy training and e-Nutribun have improved public health awareness and reduced malnutrition, with evidence supporting their positive effects on child health. The Water and Sanitation component (*M* = 3.70) has improved access to safe water and sanitation through localized testing and sanitation technologies, contributing to better hygiene and reduced waterborne diseases. In Disaster Risk Reduction and Climate Change Adaptation (DRRMCA) (*M* = 3.70), tools like Automated Rain Gauges and LGU Information Dissemination Systems have strengthened disaster preparedness, with real-time monitoring improving response efforts. The Livelihood sector (*M* = 3.73) has seen a significant impact on economic stability, with programs in food processing, entrepreneurship, and tech-based enterprises driving income generation and economic resilience. Overall, the CEST program's consistent Very High ratings demonstrate its alignment with community needs and its successful outcomes in improving well-being. However, slight variations in performance *(SD* = 0.45–0.47) across regions suggest that localized challenges may affect implementation, underscoring the need for continued assessments to ensure equitable and effective delivery.

Table 17. Level of LGU Performance in Implementing the CEST Program in terms of Project Outcomes

Indicator	*M*	*SD*	Interpretation
1. The LGU assists in the identification and validation of the S&T requirements of the area.	3.77	0.43	VH
2. The LGU assists in identifying and coordinating with potential project beneficiaries and partners.	3.74	0.44	VH
3. The LGU assists in the coordination with the LGU-assigned focal persons during the implementation of the program.	3.74	0.46	VH
4. The LGU assists in the organization of convergence support services from the national government agencies, academe, and nongovernmental offices based in the municipality	3.76	0.43	VH
5. The LGU monitor and ensure the successful execution of the project activities	3.73	0.47	VH
Overall Mean	3.75		VH

Legend: N = 90*. This mean is interpreted as follows: 3.26-4.00 = Very High (VH), 2.51-3.25 = High (H), 1.76-2.50 = Low (L), 1.00-1.75 = Very Low (VL).*

Table 17 presents that the Local Government Unit (LGU) demonstrates a very high level of performance in implementing the Community Empowerment through Science and Technology (CEST) program, as perceived by respondents. With an overall mean score of 3.70 (Very High), the findings indicate that LGUs are actively engaged in all phases of program implementation, from identifying S&T needs to coordinating with stakeholders and monitoring project execution. Key performance areas include the LGU's proactive role in the identification and validation of community S&T requirements (*M* = 3.77, *SD* = 0.43), ensuring that interventions align with community needs. Additionally, the LGU demonstrates effective coordination with beneficiaries and project partners (*M* = 3.74, *SD* = 0.44) and works closely with assigned focal persons during implementation (*M* = 3.74, *SD* =

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0.44). The facilitation of convergence support from government agencies, academe, and NGOs (*M* = 3.76, *SD* = 0.43) further reflects the LGU's ability to mobilize multi-sectoral collaboration. Moreover, the LGU's strong oversight role is evident in its monitoring and ensuring of successful project execution (*M* = 3.73, *SD* = 0.47). These performance indicators collectively affirm the LGU's central role in enabling the success of CEST initiatives.

Table 18. Relationship between the adoption of CEST Variables, Sustainability Community Variables, and LGU Performance Variables

Adoption of CEST Variables	Sustainability Community Development Variables					LGU Performance Variable
	Education	Health and Nutrition	Water and Sanitation	Disaster Risk Related and Climate Change Adaptation	Livelihood Projects	Project Outcomes
Government Grants	.624*** Strong	.614*** Strong	.589*** Moderate	.586*** Moderate	.670*** Strong	.741*** Strong
Private Sector	.225* Weak	.220* Weak	.230* Weak	.277** Weak	.215* Weak	0.197 Very Weak
Community Contribution	.551*** Moderate	.585*** Moderate	.605*** Strong	.556*** Moderate	.671*** Strong	.609*** Strong

Note: df= 90. Cells contain the Pearson r correlation coefficient and can be verbally interpreted for their strength.
**p <.05. **p<.01. ***p<.001*

Table 18 presents a statistically significant relationship between funding mechanisms used in the adoption of the Community Empowerment through Science and Technology (CEST) program and their impact on sustainability and LGU performance. Among the funding sources, government grants demonstrated the strongest positive correlations across all sustainability indicators education (*r* = .624), health and nutrition (*r* = .614), water and sanitation (*r* = .589), disaster risk and climate adaptation (*r* = .586), livelihood projects (*r* = .670), and overall project outcomes (*r* = .741). This indicates that government funding is a highly effective mechanism for supporting sustainable development and enhancing LGU performance.

Community contributions also showed moderate to strong positive correlations, particularly in livelihood (*r* = .671), water and sanitation (*r* = .605), and health and nutrition (*r* = .585), with a strong correlation to overall project outcomes (*r* = .609). These findings underscore that community financial participation is nearly as effective as government grants in driving sustainability and project success, emphasizing the importance of community ownership and involvement.

In contrast, private sector funding demonstrated only weak correlations, with the highest being disaster risk and climate change adaptation (*r* = .277) and overall project outcomes (*r* = .197). While private sector involvement contributes modestly, its impact is limited, suggesting it plays a supplementary role rather than being a primary driver of sustainable development.

Table 19. Relationship between the Training Capability Building Performance Variables, Sustainability Community Variables, and LGU Performance Variables

Training and Capacity Building Performance Variables	Sustainability Community Development Variables					LGU Performance Variable
	Education	Health and nutrition	Water and Sanitation	Disaster Risk Related and Climate Change Adaptation	Livelihood Projects	Project Outcomes
Technical Skills Training	.625*** Strong	.630*** Strong	.599*** Moderate	.557*** Moderate	.640*** Strong	.606*** Strong
Community Skills Training	.475*** Moderate	.574*** Moderate	.531*** Moderate	.586*** Moderate	.641*** Strong	.561*** Moderate

Note: df= 90. Cell contains Pearson r correlation coefficient and verbal interpretation of its strength.
**p <.05. **p<.01. ***p<.001*

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Table 19 presents the significant role of training and capacity-building in enhancing sustainability and LGU performance in the CEST program. Technical skills training showed strong positive correlations with key areas like education (r = .625), health and nutrition (r = .630), livelihood projects (r = .640), and project outcomes (r = .606), indicating its crucial contribution to successful and sustainable development initiatives. However, its impact was slightly lower in water and sanitation (r = .599) and disaster risk-related efforts (r = .557), suggesting room for improvement in these sectors.

Community skills training demonstrated moderate correlations across all areas, with the strongest link to livelihood projects (r = .641), emphasizing its effectiveness in promoting economic self-sufficiency. Though slightly less impactful than technical training in some sectors, community skills training remains essential for building local capacity and increasing community involvement.

Table 20. Relationship between Community Engagement Variables, Sustainability Community Development Variables, and LGU Performance Variables

Community Engagement Variables	Sustainability Community Development variables					LGU Performance variable
	Education	Health and nutrition	Water and Sanitation	Disaster Risk Related and Climate Change Adaptation	Livelihood Projects	Project Outcomes
Involvement	.659*** Strong	.668*** Strong	.604*** Strong	.584*** Moderate	.726*** Strong	.713*** Strong
Participation	.670*** Strong	.754*** Strong	.690*** Strong	.679*** Strong	.778*** Strong	.730*** Strong

Note: df= 90. Cells contain the Pearson r correlation coefficient and can be verbally interpreted for their strength.
**p <.05. **p<.01. ***p<.001*

Table 20 presents a strong, statistically significant relationship between community engagement and the sustainability of development initiatives and LGU performance (p < .001). Community involvement showed strong correlations with education, health and nutrition, water and sanitation, livelihood projects, and project outcomes, with the highest impact on livelihood (r = .726) and project outcomes (r = .713). However, its correlation with disaster risk and climate change adaptation was moderate (r = .584), suggesting a need for stronger engagement in this area.

Similarly, community participation demonstrated strong correlations across all sustainability indicators, especially in livelihood (r = .778) and health and nutrition (r = .754), reinforcing its vital role in driving successful outcomes. These findings confirm that active community participation significantly enhances LGU performance and project sustainability.

CONCLUSIONS

In conclusion, the study highlights that the high level of adoption, strong administration, and effective performance of LGUs in the CEST program are driven by robust funding mechanisms, comprehensive training and capacity-building efforts, and active community engagement. These factors collectively contribute to CEST projects' successful implementation and sustainable impact on community development. Continued strengthening of these areas is essential to ensure the ongoing success and expansion of the CEST program.

RECOMMENDATIONS

The study highlights the essential role of government grants in the success and sustainability of CEST projects. To improve implementation, the Department of Science and Technology (DOST) should advocate for increased funding, streamline grant processes, and ensure equitable distribution across key sectors. DOST should also encourage private sector involvement through CSR initiatives and incentives like public recognition.

Expanding technical and community skills training and continuous capacity-building is crucial to empower local communities and future leaders. Strengthening partnerships with LGUs and promoting participatory decision-making will enhance community engagement and ownership. Additionally, DOST should improve monitoring and evaluation systems, integrate disaster resilience and climate strategies, and explore alternative financing options such as public-private partnerships and community-based funds.

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