

Implementation Digital Financial Technology in Supporting Financial Inclusion in CSR Fund Management in Pulau Ketam Conservation Area, Kuala Perlis, Malaysia

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Abstract

This community service program aims to implement digital financial technology as an effort to strengthen financial inclusion in the management of Corporate Social Responsibility (CSR) funds within the Pulau Ketam Conservation Area, Kuala Perlis, Malaysia. The collaboration between Panca Budi Development University (UNPAB) and Tuanku Syed Sirajuddin Polytechnic (PTSS) is designed to empower local communities through the integration of financial technology (FinTech) solutions. The program focuses on enhancing community capacity in financial literacy, increasing transparency in CSR fund management, and supporting sustainable conservation activities. By applying participatory methods, training, and mentoring, this program provides a platform for local stakeholders to adopt digital financial applications effectively. The outcomes of this initiative include the improvement of financial management skills, strengthened accountability in CSR fund utilization, and the promotion of financial inclusion among marginalized groups. This program demonstrates that FinTech can serve as a strategic tool for community empowerment, sustainable development, and cross-border academic collaboration.

keywords: Digital Finance; Financial Inclusion; CSR Fund Management; Community Empowerment; Conservation Areas.

INTRODUCTION

Pulau Ketam in Kuala Perlis, Malaysia, is one of the coastal areas that plays a vital role in conserving mangrove ecosystems while supporting the livelihoods of local communities, most of whom work as fishermen and small-scale entrepreneurs engaged in seafood-based businesses (Khera et al., 2021; Naumenkova et al., 2019). This area also holds significant cultural and social values, as emphasized by research on the cultural landscape of *Kampung Pulau Ketam*, which highlighted the community's dependence on coastal resources and the urgent need for sustainable governance (UiTM IR, 2016). Conservation efforts have been carried out through initiatives such as the planting of hundreds of mangrove trees by the local community, which indicates strong public participation but still requires sustainable and transparent funding mechanisms (NRES, 2016). In this context, the implementation of digital financial technology can provide a strategic solution for managing incoming Corporate Social Responsibility (CSR) funds to support conservation programs while promoting financial inclusion in this area (Ozili, 2018; Lauer & Lyman, 2015).

The socio-economic conditions of the *Pulau Ketam* community reveal challenges related to financial literacy and limited access to formal financial institutions. Such issues are common in coastal communities, where cash transactions remain dominant and banking services are not always easily accessible (Al-Afeef & Alsmadi, 2025). This situation can create vulnerabilities in managing public or CSR funds intended for collective welfare (OECD, 2025). Therefore, the adoption of digital financial technologies—such as mobile banking, e-wallets, application-based financial record systems, and even blockchain for CSR fund accountability—can serve as instruments that bridge the needs of local communities with modern financial systems. Digital financial technology not only ensures transparency and accountability in CSR fund management but also broadens community participation in accessing financial services (McKinsey, 2022; Deloitte, 2024).

At the national level, Malaysia has placed financial inclusion at the forefront of its policy agenda. Bank Negara Malaysia (BNM) launched the Financial Inclusion Framework 2023–2026 to expand access, improve utilization, and enhance the quality of secure financial services, particularly for rural and vulnerable communities (BNM, 2023). Malaysia's financial inclusion indicators show relatively high achievement in terms of account ownership and the availability of financial service points, yet challenges remain in financial literacy, adoption of digital services, and addressing the rural–urban divide (BNM, 2024). In this regard, *Pulau Ketam*, as a conservation area and coastal community, could serve as a social laboratory to test the effectiveness of digital financial technology implementation in supporting CSR fund management in a sustainable and inclusive manner.

The partnership between Panca Budi Development University (UNPAB) and Tuanku Syed Sirajuddin Polytechnic is strategic in integrating academic perspectives, technology, and community empowerment. This community service program is not only about transferring technology but also about enhancing digital and financial literacy among local residents. Through this program, CSR fund management can become more systematic, where corporate donors are assured of accountability while communities gain access to modern financial services that can support micro-enterprises, ecotourism development, and conservation initiatives. This aligns with the argument of Beck and Demirgüç-Kunt (2008) that financial inclusion significantly contributes to reducing inequality, expanding economic opportunities, and promoting sustainable growth.

Moreover, the success of digital financial technology implementation in this area may serve as a model for other conservation zones in Malaysia and across Southeast Asia. The digital transformation of CSR fund management not only supports local economic development but also strengthens sustainable environmental governance (Thailand Business News, 2025). Previous studies have also emphasized that integrating digital finance into community governance improves fund distribution efficiency, reduces transaction costs, and provides valid digital records for auditing (Ozili, 2018). Therefore, this community service activity has strategic relevance at the local, national, and regional levels.

In conclusion, the current condition of *Pulau Ketam* demonstrates a real need for a transparent, accountable, and inclusive CSR fund management system. Implementing digital financial technology not only addresses challenges in financial management but also opens access for communities to formal financial services, promotes digital financial literacy, and strengthens the sustainability of conservation programs. This situation illustrates that the

community service collaboration between UNPAB and Politeknik Tuanku Syed Sirajuddin has great potential to contribute to financial inclusion while supporting ecological sustainability in Malaysia's coastal areas.

The partner in this community service project is the coastal community of *Pulau Ketam*, which is actively involved in mangrove ecosystem conservation as well as in managing Corporate Social Responsibility (CSR) funds provided by companies and local government agencies. The main challenges faced by the partner can be identified in terms of financial management, access to financial services, and community organizational governance.

First, a fundamental problem lies in financial access and literacy. The majority of *Pulau Ketam* residents work in the informal sector, such as traditional fisheries, seafood processing, and small-scale businesses related to tourism and cultural activities. Their economic activities remain highly dependent on cash transactions, while access to formal banking or financial institutions is limited due to geographical constraints and low levels of digital literacy. This situation makes it difficult for the community to manage funds, save money safely, or access microfinance services that could potentially support the development of their small businesses (ImpactAlpha, 2025).

Second, a major issue concerns the management of CSR funds, which has not been carried out optimally. To date, CSR funds allocated to support conservation programs and community development are still managed manually with simple record-keeping. This creates several problems, including limited transparency, potential fund leakages, and difficulties in producing proper accountability reports that meet corporate standards. Such conditions may undermine the trust of corporate donors in channeling CSR funds continuously, even though these funds represent one of the most important financial sources for mangrove rehabilitation and local economic empowerment (van Bijsterveldt et al., 2025).

Third, there is a problem regarding the institutional capacity of the community. The local organizations in *Pulau Ketam* responsible for conservation programs and CSR fund management have yet to establish a modern administrative system integrated with technology. This limitation results in weak organizational governance, particularly in program planning, fund monitoring, and evaluation of impacts on both the community and the environment. Without sufficient systems, the community struggles to demonstrate accountability and effectiveness in program implementation.

In addition, the partner faces challenges in adopting digital technology. Although many residents own smartphones, the use of digital financial applications such as mobile banking or e-wallets remains low. The main obstacles are a lack of understanding of the benefits and safety of these technologies, as well as limited skills in their use. Some community members also express concerns about digital fraud or data loss, which slows down the adoption of digital finance.

From the perspective of program sustainability, another issue is the lack of long-term funding. Mangrove rehabilitation programs require continuous financing, while current funding still relies heavily on corporate contributions or government projects. Without a transparent, sustainable, and trustworthy financial management mechanism, conservation activities risk being discontinued or losing effectiveness (Arner et al., 2020; Owuor et al., 2024; Uvet et al., 2025).

These challenges clearly indicate that the partner requires support in the form of capacity building, digital financial literacy education, and the implementation of a CSR fund management system supported by digital financial technology. With these improvements, the community will be able to strengthen transparency in fund management, broaden access to financial services, and ensure the long-term sustainability of conservation initiatives in *Pulau Ketam*.

The community partner in *Pulau Ketam*, Kuala Perlis, Malaysia, faces several critical issues. First, low financial and digital literacy limits the community's ability to manage funds, save money securely, and utilize formal financial services. Second, the management of CSR funds is still carried out manually with simple record-keeping, resulting in low transparency and accountability, as well as difficulties in preparing appropriate reports for corporate donors. Third, the institutional capacity of the community remains weak, as there is no modern administrative system integrated with technology to support effective organizational governance, planning, monitoring, and evaluation. Fourth, the adoption of digital technologies remains limited despite smartphone ownership, due to lack of understanding, concerns about fraud risks, and minimal technical skills. Fifth, there are challenges in ensuring sustainable funding for conservation, since mangrove rehabilitation programs rely heavily on external contributions without a long-term and trustworthy financial mechanism (Mohammad, 2025).

Several solutions are proposed through the community service program to address these issues. First, digital financial literacy training for local residents to improve their understanding of financial management, secure transactions, and the use of financial applications. Second, implementation of CSR fund management systems based on digital financial technology, such as e-wallets, mobile banking, or transparent digital record-keeping applications, to ensure accountability and facilitate auditing processes. Third, strengthening community institutional capacity through assistance in organizational governance, reporting systems, and the integration of digital administrative tools to enhance credibility with external partners. Fourth, assistance in digital technology adoption by providing practical training, application simulations, and strategies to mitigate risks related to digital security. Fifth, sustainability strategies for funding through diversification of financial sources, including collaboration with eco-tourism initiatives, development of seafood-based micro-enterprises, and long-term partnerships with corporations through sustainable CSR schemes.

RESEARCH METHOD

The approach method offered in this community service program is designed to address the partner's problems holistically through capacity building, technology adoption, and sustainable community empowerment. The methods are described as follows:

Table 1. Proposed Approach Method

No.	Approach Method	Description
1.	Needs Assessment and Community Engagement	Conduct surveys, focus group discussions, and interviews to identify financial literacy levels, CSR fund management challenges, and readiness for digital finance adoption. Involve local stakeholders (village committees, conservation groups, youth).
2.	Capacity Building and Training	Provide digital financial literacy training on money management, savings, secure transactions, and use of e-wallets/mobile banking. Conduct workshops on CSR fund management systems and train community organizations in digital record-keeping and reporting.
3.	Implementation of Digital Finance Technology	Introduce user-friendly digital platforms for CSR fund management accessible via smartphones. Pilot the use of e-wallets or mobile banking for CSR disbursement and conservation projects. Develop SOPs for digital fund allocation, monitoring, and reporting.
4.	Assistance and Mentoring	Offer continuous mentoring on the use of digital finance applications, troubleshooting, and digital security. Assign monitoring teams from UNPAB and PTSS to guide implementation and evaluate outcomes.
5.	Evaluation and Sustainability Strategy	Conduct evaluations to measure improvements in transparency, accountability, and adoption rates. Design sustainability strategies linking digital finance systems with eco-tourism, seafood-based micro-enterprises, and long-term CSR partnerships. Prepare academic outputs (journals, reports, videos).

Partner Participation Description

The active participation of the partner plays a central role in ensuring the success of this community service program. The partner institution, represented by Politeknik Tuanku Syed Sirajuddin (PTSS) Malaysia and local stakeholders in the Pulau Ketam Conservation Area, is expected to provide full support in terms of coordination, data provision, and field facilitation. Their role begins with granting permission and formal approval through the signing of the Memorandum of Agreement (MOA), which establishes the legal and cooperative framework for the project. During the observation and data collection stage, partners contribute by providing access to relevant information, facilitating interactions with the local community, and identifying key problems related to digital financial literacy and CSR fund management. Furthermore, the partner is actively involved in preparing and validating training materials to ensure their relevance to local conditions.

In the implementation stage, the partner will assist in mobilizing participants, providing logistical support, and creating a conducive environment for training and workshops. This includes technical assistance in the application of digital finance technology and helping monitor the use of CSR funds within the conservation area. Additionally, the partner plays a crucial role in sustaining the outcomes by encouraging the community to continue using digital platforms in their financial management and ensuring the integration of CSR initiatives with environmental conservation goals. Finally, the partner will also contribute to the dissemination of results by supporting academic publications, participating in evaluations, and promoting the sustainability of the program. Thus, the partner's participation is not only limited to administrative and technical assistance but also extends to strategic involvement in ensuring long-term impact and program sustainability.

Evaluation of Program Implementation

The evaluation of the community service program is carried out regularly to ensure that the objectives and expected outcomes are achieved effectively. The evaluation process begins with monitoring activities during the preparation and implementation phases, including the assessment of partner involvement, participant engagement, and the suitability of training materials with community needs. Both formative and summative evaluations are applied: formative evaluation is conducted throughout the program to identify challenges in real time and provide immediate solutions, while summative evaluation focuses on measuring the overall impact after the completion of the activities.

Key indicators of evaluation include the level of digital financial literacy acquired by participants, the effectiveness of CSR fund management using digital finance technology, and the degree of community participation in the Pulau Ketam Conservation Area. Data for evaluation are collected through surveys, interviews, and direct observations, complemented by feedback from stakeholders and partner institutions. The results of the evaluation are then analyzed to identify strengths, weaknesses, opportunities, and potential risks in program implementation.

Furthermore, the evaluation does not only emphasize the outputs, such as the number of participants trained or publications produced, but also the outcomes, such as the sustainability of CSR fund management practices and the long-term empowerment of the community. The findings from the evaluation serve as recommendations for improvement in future programs, ensuring that the partnership between Universitas Pembangunan Panca Budi (UNPAB) and Politeknik Tuanku Syed Sirajuddin (PTSS) can continue to generate significant academic contributions and practical impacts for the conservation area.

Table 2. Evaluation Instruments of Community Service Programs

Evaluation Aspect	Indicator	Method of Data Collection	Instrument/Tool	Expected Output
Preparation	Existence of MOA and partner commitment	Document review, interview	MOA, attendance list	Formalized cooperation and commitment
Implementation	Number of participants, training attendance, engagement level	Observation, attendance record	Observation sheet, attendance list	Active participation in training/workshop
Knowledge & Skills	Improvement in digital financial literacy	Pre-test & post-test	Test questionnaire	Increased literacy level among participants
CSR Fund Management	Application of digital finance technology in fund management	Interview, case documentation	Interview guide, system usage logs	Adoption of digital finance tools
Community Involvement	Degree of local stakeholder participation	Observation, FGD	FGD notes, observation sheet	Strengthened community participation
Outputs	Number of publications, video	Document analysis	Publication records, report draft, video	Disseminated academic and practical outputs

Evaluation Aspect	Indicator	Method of Data Collection	Instrument/Tool	Expected Output
	documentation, and reports			
Sustainability	Continuity of digital management practice	CSR fund	Follow-up interviews, monitoring	Sustainability checklist, feedback form

Regional Potential

Local Resources and Local Wisdom

The implementation of community service in the Pulau Ketam Conservation Area is closely related to the utilization of local resources and local wisdom that has been practiced for generations by the community. Pulau Ketam, which is well-known as a fishing village, relies heavily on its rich marine biodiversity and coastal ecosystem as the main source of livelihood. Local resources such as fisheries, aquaculture, and mangrove ecosystems are not only economic assets but also ecological capital that must be preserved. The community's traditional knowledge in sustainable fishing practices, seasonal harvesting, and mangrove conservation reflects a form of local wisdom that contributes to the balance between economic activities and environmental sustainability.

Local wisdom also appears in the form of strong social cohesion, mutual cooperation (*gotong-royong*), and community-based conservation practices. These values serve as a foundation for the effective implementation of CSR programs, as they strengthen the sense of ownership and collective responsibility among community members. Furthermore, the community has a tradition of collective financial practices, such as rotating savings and small-scale cooperative management, which can be integrated with digital finance technology. This integration not only preserves cultural values but also enhances transparency and accountability in CSR fund management.

By leveraging local resources and local wisdom, the program aims to ensure that the application of digital finance technology does not replace but rather complements existing community practices. For example, the use of digital platforms for CSR fund allocation can be aligned with traditional consensus decision-making processes, thereby ensuring inclusivity and trust among stakeholders. Thus, the synergy between modern technology and local wisdom becomes a strategic pathway to achieve sustainable financial inclusion and long-term conservation goals in Pulau Ketam.

Facilities and Infrastructure in Pulau Ketam Conservation Area

The facilities and infrastructure in the Pulau Ketam Conservation Area play an important role in supporting both community livelihoods and conservation efforts. Pulau Ketam, being a coastal and fishing village, is equipped with basic infrastructure such as small ports and jetties that facilitate fishing, aquaculture, and the transportation of goods and people. In addition, there are traditional fish markets, storage facilities, and community halls that serve as gathering spaces for local residents to conduct social and economic activities. These infrastructures reflect the community's dependency on marine resources while also acting as the backbone for economic sustainability.

From an ecological perspective, the conservation area is supported by natural infrastructure such as mangrove forests, tidal ecosystems, and fishing zones that are maintained through local wisdom and community participation (Ahmad et al., 2025; McKinsey, 2021; The Payments Association, 2025). The existence of community-managed mangrove areas is not only crucial for protecting biodiversity but also serves as a natural barrier against coastal erosion and climate change impacts. Supporting facilities such as boats, aquaculture ponds, and simple monitoring equipment are available, although they require improvements to enhance efficiency and environmental sustainability (Tarafdar et al., 2023; Gao et al., 2022).

In terms of social infrastructure, the area has schools, religious centers, and limited health facilities, which reflect the community's socio-cultural resilience. However, there is still limited access to advanced digital infrastructure such as stable internet connections, modern financial service outlets, and digital payment systems (Visa, 2024; Telecom Review Asia, 2025). This limitation poses challenges but also provides opportunities for the introduction of digital financial technology as part of CSR fund management. Strengthening digital infrastructure and integrating it with existing facilities will not only enhance financial inclusion but also ensure that conservation and economic activities are managed more transparently, efficiently, and sustainably (Lee, 2025).

Potential Aspects of Pulau Ketam Conservation Area

Pulau Ketam Conservation Area holds significant potential from ecological, economic, social, and cultural perspectives that can be further developed through sustainable programs. Ecologically, the area is rich in marine biodiversity, mangrove ecosystems, and fisheries resources that serve as the backbone of the local community's livelihood while also contributing to environmental sustainability. The presence of mangrove forests provides natural protection against coastal erosion and climate change impacts, while also serving as breeding grounds for various marine species. This ecological richness positions Pulau Ketam as a strategic site for conservation, ecotourism, and educational programs on coastal resource management.

From an economic perspective, the community's dependence on fisheries, aquaculture, and small-scale trading provides opportunities for value-added activities, such as seafood processing, eco-friendly aquaculture, and the integration of digital financial services to strengthen financial inclusion. The introduction of digital finance technology in managing CSR funds offers the potential to enhance transparency, efficiency, and accountability, thus supporting sustainable local economic development.

Socially and culturally, Pulau Ketam possesses strong community cohesion, collective decision-making traditions, and local wisdom in managing natural resources. These values form a solid foundation for participatory programs that encourage community empowerment and long-term ownership of conservation initiatives. Moreover, Pulau Ketam has the potential to be developed as a cultural and eco-tourism destination, showcasing both its natural beauty and unique traditions. By leveraging these ecological, economic, and socio-cultural potentials, the Pulau Ketam Conservation Area can be transformed into a model of sustainable development where local wisdom is harmonized with modern technology to achieve financial inclusion, environmental sustainability, and community resilience.

RESULTS AND DISCUSSION

Results of the Program

The implementation of the community service program in Pulau Ketam Conservation Area has yielded several significant results, both in terms of knowledge transfer and community empowerment. First, the program successfully introduced the concept and practical application of digital finance technology in the management of CSR funds, which enhanced transparency, accountability, and efficiency. Local stakeholders, including community leaders and representatives from conservation groups, demonstrated improved understanding of digital tools for financial inclusion.

Second, the activities strengthened the capacity of the community in managing financial resources through training sessions, workshops, and mentoring. The community gained the ability to integrate digital financial platforms into their daily economic activities, particularly in fisheries, aquaculture, and eco-tourism. This resulted in better record-keeping, improved access to financial services, and enhanced collaboration with external stakeholders such as local government and private institutions.

Third, the program fostered cross-institutional collaboration between Panca Budi Development University (UNPAB), Tuanku Syed Sirajuddin Polytechnic Malaysia, and local stakeholders. This collaboration not only supported the technical implementation of the program but also created opportunities for future joint initiatives in research, training, and community development.

In addition, the program produced several tangible outputs, including documentation of activities in video format, academic publications in national and international journals, and a formal community service report. These outputs are expected to serve as references for similar initiatives in other coastal conservation areas. Overall, the program has had a positive impact on strengthening financial inclusion, promoting sustainable community-based conservation, and empowering local residents of Pulau Ketam through the adoption of digital finance technology.

The community service program titled “Implementation of Digital Finance Technology in Supporting Financial Inclusion in CSR Fund Management in Pulau Ketam Conservation Area, Kuala Perlis, Malaysia” was successfully conducted on April 30, 2025. The program brought together representatives from Universitas Pembangunan Panca Budi (UNPAB), Politeknik Tuanku Syed Sirajuddin Malaysia, local community leaders, and stakeholders from the conservation area.

The timing of the activity was significant, as it coincided with the increasing global emphasis on digital transformation and sustainable community development. By conducting the program within the context of Pulau Ketam—a coastal conservation area with unique socio-economic dynamics—the initiative effectively addressed local challenges in financial management while promoting inclusive digital solutions.

During the implementation, participants were actively engaged in workshops and discussions related to the use of digital finance applications for CSR fund management. Practical demonstrations were carried out, enabling the local community to understand how digital tools can improve transparency, accountability, and accessibility in managing financial resources. This interactive approach ensured that the training was not only

theoretical but also directly applicable to the daily financial practices of the community.

The discussion sessions also highlighted key challenges faced by the community, such as limited digital literacy, concerns over data security, and infrastructure constraints such as internet connectivity. These challenges were addressed by providing tailored mentoring and simplified training materials to ensure broader community participation. Furthermore, the collaboration between academic institutions and local stakeholders created a shared learning environment, where knowledge exchange was mutually beneficial.

The program also demonstrated that digital financial technology could be a catalyst for strengthening financial inclusion in conservation-based communities. With improved access to digital tools, the community of Pulau Ketam is now better equipped to manage CSR funds, which can be reinvested into conservation activities, eco-tourism initiatives, and local entrepreneurship.

The program conducted on April 30, 2025 served as both a practical intervention and a model for academic-community partnership. It not only achieved its immediate goals but also laid the foundation for future collaboration, sustainable financial practices, and the empowerment of local communities in conservation areas.

CONCLUSION

The community service program in Pulau Ketam Conservation Area, Kuala Perlis, Malaysia, conducted on April 30, 2025, successfully integrated FinTech tools with local empowerment efforts in Pulau Ketam, demonstrating enhanced transparency, accountability, and efficiency in CSR fund management while supporting mangrove conservation and sustainable development. Led by Panca Budi Development University (UNPAB) and Tuanku Syed Sirajuddin Polytechnic Malaysia alongside local stakeholders, the initiative delivered participatory training, mentoring, and workshops to address digital literacy and infrastructure gaps, enriching students and lecturers with real-world applications of theoretical knowledge in problem-solving, innovation, and ethical practices, and fostering cross-border cultural exchange. Overall, it established a foundation for financial inclusion and digital empowerment, offering a replicable model for rural and conservation communities. For future research, longitudinal studies could evaluate the program's long-term impacts on financial behaviors, conservation outcomes, and scalability across Southeast Asian coastal regions using mixed-methods approaches like surveys and blockchain-tracked fund audits.

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