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Digital Microfinance and Behavioral Nudges: A Comparative Study of Fisher Communities in Philippines and India

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Abstract

Digital financial inclusion and behavioral interventions are increasingly recognized as critical tools for empowering low-income populations. This study reviews literature from the past decade to compare how digital microfinance and "nudges" (behavioral prompts) are impacting small-scale fisherfolk in the Philippines and India. Our comparative analysis adopts a most-different-systems case-study design, since both countries have significant small-scale fishing sectors but differ markedly in scale, economic size, and institutional context. This approach helps isolate factors that are robust across settings. We analyze case studies and behavioural data on mobile banking, fintech credit, and community finance models in these regions. In the Philippines, initiatives like GCash's partnership with agri-platform Mayani aim to close a ₱360 billion (~$6.3B) fisheries credit gap. In India, widespread adoption of smartphones, UPI (Unified Payments Interface) and app-based lenders has enabled instant small loans (hundreds to thousands of rupees) to fishers via digital wallets. We also examine evidence on behavioral nudges – low-cost interventions (e.g. reminders, defaults, social cues) that influence saving or repayment behavior. Global studies show that simple reminders and goal-setting can significantly boost savings and reduce delinquencies. However, tailored evidence for fisher communities is scarce. We discuss the differing socioeconomic contexts and financial ecosystems of the two countries, identify gaps and opportunities, and offer recommendations.

Keywords: *Digital Microfinance; Financial Inclusion; Behavioral Nudge; Small-Scale Fisheries; Philippines; India; Mobile Banking*

1. Introduction

The conditions in which India's marine fishers operate are one of the most uncertain and dangerous for small-scale production in the world [1]. Their livelihoods are reliant on natural resources inherently unpredictable, and that are shaped by seasonal monsoons, oceanographic conditions, as well as

climate variablity[1]. There are certain risks faced by these fishers, such as sudden cyclones that can damage resources, unpredictable fluctuations of price at auction markets, as well as periodic government mandated fishing bans that intend to let the fish stocks regenerate [1]. For the communities where daily earnings are heavily dependent on the catches' volume and price, these dangerous conditions of production translate into dangerous financial conditions for the household.

Sometimes a fishing trip may be successful enough to support a family for weeks, whereas sometimes, due to weather conditions that prevent a trip in the first place, the families might have to rely on loans and have trouble meeting basic needs.

In such conditions, credit has usually served as the support system for fish-reliant economies. It is important for fisherfolk to have sufficient working capital at the landing site, wherein purchasing of fuel, repair to damaged nets, ice for preserving catch, and food for multi day trips are just some of the few requirements [2]. Credit also enables fishers to hold their catch until the aforementioned auction prices stabilize, which further helps avoid the need to sell for a loss when there is an oversupply. Without immediate liquidity, a lot of households would be unable to fish at all because cash intensive requirements are extremely important for each trip to the sea. Therefore, credit is not merely a financial instrument in fishing reliant economies, but rather something that is a requirement to partake in economic activity.

Usually, Primary Fishermen's Cooperative Societies (PFCS) have been playing a central role in giving the fisherfolk such credit. These cooperatives were designed with the objective to pool resources which allows a reduction of dependence on moneylenders [3]. These cooperatives typically bundle financial functions with other miscellaneous services such as organization of auctions, marketing fish, and helping provide subsidized fuel [4].

The strength of these cooperatives relies on social cohesion. The members usually know each other, repayment is monitored through community based mechanisms, and mutual accountability was promoted in order to minimize defaults [5]. Moreover, self help groups fostered under poverty alleviation schemes played a role in bringing diversity to financial access [6]. Self Help Groups allow households to borrow money for purposes like health emergencies [7]. Cooperatives, as well as the aforementioned self help groups, act as alternatives to exploitative credit sources.

Even after these arrangements, the credit resources are mostly dominated by traders and moneylenders [8]. There are many reasons for this. First and foremost, these informal sources provide instant loans, free of delays or collateral needs. Second, they base their credit on future fishing sales which creates a form of interlinked transaction wherein fisherfolk have to repay their credit by selling their catch at a threshold below the market price. Finally, these arrangements, although exploitative, are still reliable. Despite the fisherfolk having knowledge of this, they still need them due to the instant access to cash the loans provide them. As a result moneylenders still overshow self help groups and cooperatives.

In the last decade however, India has found a new factor at its landing sites, which is app based microcredit platforms. These are enabled by the new wave of affordable smartphones, affordable mobile data networks, and the fast growing adoption of UPI. These factors come together to provide instant, small ticket, and unsecured loans [9]. Differing from usual Cooperatives that require memberships and a following of organizational rules, or Self Help Groups that work on guarantees, the aforementioned digital platforms rely on algorithmic factors. Fisherfolk with smartphones can apply for a loan in minutes and receive an almost instantaneous decision, as well as receive funds in their digital wallets or bank accounts directly.

The loan sizes are typically modest—ranging from a few hundred to several thousand rupees—but they can be crucial for covering immediate expenses such as fuel purchases or household consumption during lean periods. The rise of app-based credit in fishing villages mirrors broader financial inclusion trends in India. The government's Jan Dhan Yojana initiative has expanded access to bank accounts, while Aadhaar-based identification systems have enabled digital KYC (Know Your Customer) processes. Simultaneously, fintech companies have targeted underserved populations, promoting narratives of empowerment and financial independence. In theory, such developments promise to democratize access to credit, especially for marginalized communities historically excluded from formal finance.

Yet, the rapid growth of digital lending has not been without pitfalls. Concerns over predatory practices, opaque interest structures, and aggressive recovery tactics prompted regulatory intervention. Since 2022, the Reserve Bank of India (RBI) has issued comprehensive guidelines to govern the digital lending ecosystem [10]. These regulations define what constitutes a Digital Lending App (DLA), mandate that only entities registered and vetted by the RBI may operate, and prohibit unregulated outsourcing of key functions. They also require lenders to disclose all charges transparently, ensuring that borrowers understand the true cost of credit. Importantly, the RBI has emphasized consumer protection, seeking to curtail the exploitative elements that had begun to proliferate in the sector [10].

Against this backdrop, fisher households in coastal Andhra Pradesh stand at a crossroads [11]. The state, home to one of India's largest marine fishing populations, exemplifies both the opportunities and risks of digital credit. On the one hand, digital microloans can provide fishers with rapid access to funds, reducing dependence on moneylenders and enabling more flexible financial management. For instance, during the annual fishing ban, when households experience prolonged income gaps, quick-access loans may help them bridge consumption needs without selling assets or pledging future catch at unfavorable terms. Likewise, after cyclones or gear losses, instant liquidity can support faster recovery. On the other hand, the very features that make digital credit attractive—speed, flexibility, and unsecured access—can also heighten risks. Without mechanisms aligned to fishing seasonality, borrowers may find themselves rolling over loans multiple times, incurring cumulative interest burdens that rival or exceed those charged by traditional moneylenders.

Thus, two intertwined questions emerge. First, do digital microloans genuinely expand financial inclusion relative to cooperatives and SHGs? That is, do they reach previously excluded households, offer more diverse products, and reduce dependence on exploitative informal credit? Or do they merely shift fishers from one form of high-cost borrowing to another? Second, do these loans enhance or undermine debt sustainability? Specifically, do they enable households to smooth consumption and invest in productive activities, or do they exacerbate rollover risks, over-indebtedness, and vulnerability to shocks?

These questions are not abstract. Their answers have direct implications for household welfare, community resilience, and the long-term sustainability of India's marine fisheries economy. The case of coastal Andhra Pradesh underscores how finance, technology, and livelihoods intersect in fragile ecosystems. While cooperatives embody community-based finance with built-in accountability, and moneylenders represent entrenched but exploitative systems, digital credit introduces a hybrid: technologically driven, individually accessed, and regulated from above rather than enforced from within. Whether this shift empowers fishers or deepens their precarity will depend not only on platform design and regulation but also on how well financial systems adapt to the unique rhythms of marine livelihoods.

2. Methodology

This study is essentially a review of relevant literature focusing on digital microfinance and behavioural nudges in the context of fisherfolk. We systematically collected sources from the last ten

years. Our sources include journal articles, government reports, etc. Our searches were a result of combining keywords like "digital microfinance," "mobile credit," "fisherfolk," "financial inclusion in the Philippines/India," and "nudges for financial behaviour." There was a prioritization of documents containing data such as statistics on credit access as well as usage outcomes.

Given the comparative aim of the study, we specifically included sources concerned with ideas such fisheries or rural finance in the two countries, as well as broader analyses (e.g., development finance reviews) whose findings might help us understand fisher communities.

Data regarding the adoption of technology, the metrics of the microfinance industry, as well as poverty incidence, was taken from national surveys and industry reports. For example, our aggregated microfinance figures were drawn from the Philippine financial inclusion strategy report [12.] Specific interventions such as the Gcash-Mayani partnership were taken from press releases or alternatively from NGO reports [13].

The evidence we found regarding behavioural nudges was more often than not from field experiments that were published on a global scale, such as studies on SMS reminders and their help in improving savings [14], or loan delinquency emails [15]. The aforementioned evidence was extrapolated to the setting of our study.

We directly incorporated quantitative study results, such as poverty rates and loan volumes. We highlighted relevant statistics in each country's section. An example would be the Philippines data showing fisher's poverty rates compared to the national rate is double [16]. While discussing nudges, we note down the effect sizes. and give absolute values whenever we find it possible. Our approach of reviewing data does not include primary data collection, but rather we aggregate pre existing knowledge.

One notable contextual difference is population scale: India’s population (~1.438 billion) is far larger and denser (~437 people/km² [17]) than the Philippines’ (~111.9 million, ~373 people/km² [17]). This disparity means aggregate figures (total loan portfolios, number of app users, etc.) naturally differ. We acknowledge that such scale differences limit the comparability of absolute metrics across cases. In other words, our study resembles a most-different-systems comparison: these countries share the issue of underserved fishers but differ on key dimensions (population, economy, institutions). We interpret cross-country contrasts with caution, noting where outcomes may reflect scale rather than fundamental design differences.

Philippine small-scale fishers operate within one of the most precarious livelihood systems in Southeast Asia [18]. Their earnings depend heavily on marine resources that are increasingly stressed by overfishing, climate change, and frequent natural disasters [18]. The Philippines, lying directly in the typhoon belt, experiences about 20 cyclones annually, of which 5–6 are typically destructive [18]. For fishing households, this volatility translates into severe income shocks. A productive catch can sustain a family for weeks, while a poor season, or worse, a storm that keeps boats docked, can push households into debt. Compounding these risks, the government periodically enforces closed seasons to allow fish stocks to recover, leaving households without income for months at a time [19]. For coastal families with few alternative livelihoods, such interruptions in fishing activity translate directly into heightened economic vulnerability.

3. Digital Microfinance in Fisher Communities

3.1 The Philippine Context

The fishery and agriculture industries of the Philippines employ a major part of the rural poor [20]. Even though fisheries are highly important (e.g. fish farming produced 54% of total fisheries output by 2022 [20]), a lot of small scale fishers do not have any formal credit. The Bangko Sentral ng Pilipinas (BSP) estimated in 2018 that over ₱360 billion (≈USD 6.3 billion) of credit is unmet in agriculture and fisheries [20]. Fisherfolk have historically depended on informal loans. A 2024 financial inclusion survey (SFFIS) was able to highlight the poverty incidence: over 34% are poor, roughly double the national average, which is 17% [21]. Due to the weakness of institutional lending, many of the fisherfolk have to resort to high-interest moneylenders or brokers who buy their catch at low prices [22][21].

Digital technologies have begun to bring a change to this. This is because mobile money and fintech are spreading even to rural fishers' islands. As an example, GCash, a popular mobile wallet in the Philippines, launched an agricultural credit product in partnership with Mayani, an agri-fisheries platform, which helped them target small farmers and fishers [23]. Mayani's network is reported to cover over 144,000 organized farmers and fisherfolk across the country [23]. By linking supply-chain data to GCash's lending, they aim to provide low-cost inputs (feeds, seeds) and build credit histories for clients. This initiative explicitly addresses the multi-billion peso credit gap: "Given this reality, Mayani intends to unlock the trapped value in the Philippine aquaculture sector by providing rural, small-scale fishers…not just a stable market offtake for their harvest…but also a pathway for them to leverage credit towards boosting their yield and incomes" [23].The goal is to finance production against firm purchase orders, thereby reducing risk for lenders and offering fishers a reliable repayment plan (via Mayani's downstream sales). This case illustrates how digital platforms are being used to reach clients who were harder to reach before.

Other than this large scale example, the Philippine microfinance sector has grown impressively overall. By 2022, it was comprised of about 6,183 institutions and was serving an estimated 18.3 million accounts [24]. The outstanding portfolio was ₱407 billion (approx. USD 7.3B) [24], which indicates strong lending to low-income households. While these figures include all small borrowers (not just fishers), they show that the tools of microfinance are widespread. Many of these services are now offered digitally. For instance, banks and MFIs partner with fintechs for mobile banking; some MFIs provide loan disbursements and repayment via GCash or other e-money. The BSP has also promoted the National Strategy for Financial Inclusion, which encourages technology adoption (e.g. agent banking, e-wallets) in underserved areas [24]. However, significant barriers remain. A study of five Philippine coastal towns found that providers faced high transaction costs and limited understanding of fishers' needs [22]. Fishers often lack required documentation or collateral, and travel costs to banks are burdensome. Thus even when digital channels exist, uptake can be slow without proper onboarding and trust-building. According to the Center for Financial Inclusion, conservation and climate programs in the Philippines have tended to overlook the role of finance [21]. Yet for adaptation and resilience, formal finance is crucial. As one report notes, "financial inclusion, defined by the Center for Financial Inclusion as affordable access to useful financial products… is often overlooked in conservation efforts" [21].

Indeed, many resilience projects (e.g. marine protected area programs) have only recently begun to integrate savings and credit components as part of livelihood support. From the literature, the Philippines shows early but promising digital finance developments. Mobile and e-wallet penetration is high (GCash alone has tens of millions of users). Anecdotally, some fishermen have started using mobile apps for payments and loans (e.g. apps for farm inputs or small loans via cooperatives). For example, FasterCapital reports that "a digital microfinance initiative has enabled fishermen to access loans via mobile phones, allowing them to invest in sustainable fishing practices" [25]. This brief statement

underscores that with smartphones and decreasing data costs, MFIs can now reach remote fishers directly. However, we found no comprehensive field study quantifying uptake among fishers specifically. The available evidence suggests that digital tools are making inroads but are not yet universal. Usage is likely higher in more connected regions (e.g. Luzon) and among younger fishers.

3.2 The Indian Context

The small scale fishing sector of India is quite large, with over 2.7 million fishermen along marine coasts plus large inland fisheries. Similar to the Philippines, Indian fishers operate in the face of seasonal cycles (monsoon, bans) and high risk. Studies have noted that Indian fisher households often have to rely on moneylenders as well as sell future catch due to not having formal credit [26][27]. A 2024 survey that was conducted in Tamil Nadu concluded that the bank account ownership and loan taking of fisherfolk were below the national averages found that bank account ownership and loan uptake among fisherfolk are below national averages [26]. Usually, fisher families have little to no collateral as boats or fishing gear are rarely acceptable to banks, and their land holdings are often in protected coastal zones [26]. Because of this, many fisherfolk repay informal debts by pledging part of each catch, which puts them in the trap of cycles of low earnings and high interest [26]. The financial exclusion is stark: "fisherman households are locked in a cycle of debt and poverty since they do not receive official financial support" [26].

There has been an explosive growth in digital payments and lending in India within the last 10 years. Unified Payments Interface, or UPI, allows bank transfers to be instantaneous as well as completed through mobile phones. There are more than 8 Billion UPI transactions monthly across India, because of the fact that now even rural fisherfolk have Aadhar Cards, as well as Jan Dhan Yojana bank accounts, Fintech Lenders capitalized on this to offer the fisherfolk instant micro loans. One recent case study on Andhra Pradesh fishers describes how cheap smartphones, expanding mobile internet, and UPI have enabled app-based credit: "platforms offer instant, small-ticket, unsecured loans" [27]. A fisherman with a smartphone "can apply within minutes, receive a decision almost instantly, and have funds disbursed directly into their digital wallet or bank account" [27][28]. The amount of the loans is modest, but immediately available for urgent needs like fuel or consumption during shortages [27].

This rapid credit is a sharp opposite of cooperative loans, which require membership, or to informal lenders, which more often than not carries exploitative terms [27][28]. This digital credit model is still evolving however. The RBI (India's central bank) only recently (since 2022) began regulating "Digital Lending Apps," requiring transparency and consumer protections [28]. Many early fintech lenders used to operate on a grey market with unclear fees, but regulations are now increasing. Several studies highlight potential pitfalls: without alignment to fishers' seasonal incomes, these app-loans can lead to over-indebtedness (rolling over loans at higher costs) [27][28]. Nonetheless, the inclusion potential is huge.

The Andhra case study emphasizes that on one hand, "digital microloans can provide fishers with rapid access to funds, reducing dependence on moneylenders" [27]. It also warns that the very features making digital loans attractive can also very likely heighten risk if not designed with fisherfolk and their assistance in mind. The author proposes user-centred products such as closed-season moratoria, seasonal repayment schedules, and "embedded savings/insurance nudges" within the app design [27]. Nation wide numbers show the scale of it. As of 2022 India had 450 million mobile broadband subscribers, and smartphone ownership in rural areas is rising above 30%, which means even remote coastal villages are increasing their numbers on the mobile network. Fintech startups have targeted the users of Paytm, Airtel Payments Bank, and others offer microloan products. Some businesses have been offering crop/fish insurance via mobile. There is no central data on how many fishers actually use digital finance, however, anecdotal reports describe fishermen in Odisha and Kerala using UPI to pay for things such as fuel, ice, as

well as to receive wages. There is however, a difference in the regulatory and institutional context of India and the Philippines. India has a vast cooperative area that includes millions of fisherfolk that are members of fishermen's cooperatives or self help groups. These help serve rural finance in a lot of areas, and many have adopted computers for record-keeping. The microfinance movement (SHGs under NABARD) has enrolled some coastal communities. However, cultural factors still make formal finance challenging. The 2024 Kanyakumari study notes that distrust of banks and lack of tailored products keep many out of formal credit [26][29]. In response, some NGOs have used group-based microcredit (SHG model) for fishers, but such efforts have been piecemeal.

In summary, India's digital finance environment is more advanced (nationwide UPI, Aadhaar) and has produced a new generation of app-based lenders. These have begun to penetrate fishing villages, providing an alternative to traditional cooperatives and moneylenders [27][28]. While the Philippines is reliant on mobile wallets and Non Government initiatives to reach fisherfolk. In both contexts the common challenge of irregular incomes poses a requirement of specially designed products.

3.3 Comparative Analysis

Despite geographical and institutional differences, some common themes emerge:

Access and Infrastructure: Both countries' fisher populations generally lack physical banking infrastructure. Digital channels have partially filled this gap. In rural Philippines, network coverage is spotty on islands, but e-wallets and agent banking are expanding. In India, mobile connectivity is widespread even in coastal regions, enabling UPI payments and mobile apps.

Loan Products and Usage: In the Philippines, formal credit for fishers often still comes through government programs or cooperatives. Digital microfinance is emerging via partnerships (e.g. Mayani–GCash). In India, fishers increasingly tap app-based loans or SHG loans. Statistics: Philippine microfinance had a ₱406.7B portfolio in Mar 2022 [30], but fishers' share is unclear. Indian fishermen's indebtedness remains high (studies report non-institutional lending persists even when cooperatives exist) [31].

Digital Literacy and Behavior: Filipino fishers average lower literacy levels, and digital literacy lags (as in rural populations). Many rely on face-to-face instructions, so nudges often come through community meetings or savings group routines (e.g. the Village Savings & Loan Associations promoted by Rare since 2016 [32]). In India, literacy is higher in some coastal states, and younger fishers are comfortable with smartphones. Here nudges can be delivered via SMS or app notifications.

Regulatory Environment: India's RBI has imposed strict guidelines on digital lending apps [33], whereas the Philippines is more permissive but still monitors e-money issuers. Both countries are actively promoting financial inclusion policies (Philippines has a National Strategy for Financial Inclusion; India has PMJDY accounts and digital KYC).

These differences imply tailored approaches. For instance, a successful nudge strategy in India might leverage SMS reminders (given high mobile phone usage) and default enrollments (as in UPI autopay), whereas in the Philippines, community-based nudges (like group commitments) might be more effective due to communal saving practices.

On the digital finance side, India's experience suggests that app-based microloans can rapidly broaden access, but safeguards (transparent pricing, seasonal terms) are needed to protect fishers. The Philippines' ecosystem hints that partnerships between fintech and agri platforms (integrating market and credit) can address the dual needs of finance and inputs.

4. Behavioural Nudges and Financial Behaviour

4.1 Nudges: Concepts and Evidence

A nudge is essentially a gentle way of intervening that can change behaviours without restricting free will and the ability to choose. When it comes to financial inclusion, some of the most notable nudges are automated reminders, social norms, or commitment based devices. Researches outside this field provides a sense of guidance. As an example, a field experiment that had 13 million borrowers in the United States found that sending recurring, monthly, and behaviourally informed emails helped significantly reduce delinquencies on loans. The best message of this kind helped reduce 60 day delinquencies by a significant margin [35].

Some of the relevant features include the framing of savings in terms of percentages and only recommending 2 steps at a time [36]. This further goes to show that even simple texts based nudges can noticeably imrpove financial behaviour.

In developing countries, SMS-based nudges have shown promise. In such inclusion programs, consistent text based reminders have skyrocketed savings deposits by simply focusing on goals as well as deadlines [37]. For example, multiple programs link the setting of goals with reminders ("remember, your savings goal is X by date Y") and achieve higher deposit rates than without reminders. One more study in Africa noted that village based saving groups emulated natural commitment devices wherein members make week by week commits to encourage savings which is enforced by peers, which is essentially a social nudge [38].

The commitment savings literature suggests that requiring users to lock funds (e.g. inaccessible until a target) significantly raises average savings [39]. The key takeaway here is that nudges are most efficient when they are based on context. Among fisherfolk who may not trust banks, or would be too busy managing their own survival, nudges would be most efficient when they align with the routines and problems they face. Text messages that are sent before usual fishing trips might nudge fisherfolk to reserve funds for inputs rather than just spending money on impulse. In multiple Asian cultures a public or communal nudge may very well be powerful.

4.2 Nudges in the Philippines and India

Direct evidence on nudges for fisherfolk is scarce, but several relevant programs hint at possibilities.

In the Philippines, the NGO Rare has organized 497 women's savings clubs (Village Savings and Loan Associations, VSLAs) in fishing communities since 2016 [40]. While not branded "nudges", these clubs embody behavioral design: they create a public commitment to save weekly, use social pressure to discourage defaults, and rotate lump-sum payouts among members. Reports indicate these VSLAs overcome typical barriers (no required ID, low fees) [41].

The fact that hundreds of clubs were formed suggests good acceptance: women often save small amounts in a visible box, which is effectively a commitment nudge (they must physically put in money each week). Rare also uses behavioral maps in community governance, training local "champions" (fisherfolk) to spread best practices – this peer influence is a social nudge technique.

Another Philippine initiative is financial literacy edutainment in local media. Though more general, such mass-media nudges (e.g. radio dramas about finance) have been tried in rural areas. One World Bank review notes "financial edutainment" as a nudge form [42]. There is evidence globally that simple financial education games or stories can change attitudes. However, without local evaluation, it's

unclear how effective these are for fishers. The Center for Financial Inclusion emphasizes that awareness-building alone is insufficient; people also need easy access and trust [43].

In India, there have been some targeted nudge experiments in rural finance. For example, one pilot encouraged farmers to save by sending personalized SMS messages referencing their own stated goals. A related study for youth savings showed that text messages (both monthly and semi-monthly) significantly reduced account withdrawals [44]. For fishers, a similar approach could be used: periodic SMS reminders about upcoming fishing bans or weather events might prompt setting aside contingency funds.

Another example: auto-enrollment. The Harvard Nudge blog highlights auto-enrollment in retirement plans [45] – in the Philippines or India, a parallel could be auto-enrolled loans for insurance or pension that the fisher must opt out of if undesired, thereby defaulting them into saving.

India's Jan Dhan scheme (mass bank account opening) has achieved near-universal formal account ownership, but active usage is lower – implementing a default recurring deposit or mandatory savings feature (with ability to opt-out) could serve as a nudge to build balances.

Social-norm nudges could work in fishing villages. In many Indian coastal hamlets, fishing is communal and caste-based. Sharing information like "80% of your village's fishers have a bank account" (if true) could motivate others to formalize. Some rural finance programs use "leaderboards" or public recognition for the best savers; such an idea could apply in either country's context.

Overall, the literature suggests that combining nudges with digital tools can amplify impact. For instance, a mobile app that gives fishers access to loans might also incorporate digital nudges: push notifications for due payments, in-app visualizations of savings goals, or gamified rewards.

Given the technical context (Philippines: GCash, Maya apps; India: UPI and banking apps), MFIs can layer behavioral prompts onto these platforms. However, we found no published field trial specifically on such an intervention for fishers. That remains a gap: much of the evidence is inferential.

5. Results and Discussion

5.1 Summary of Findings

5.1.1 Poverty and Exclusion

In the context of both India and the Philippines, there is a very high rate of poverty within fisherfolk families. In the Philippines specifically, the rate of poverty for fisherfolk is 34%, which is double that of the national average(17%) [46] Indian data on fisher poverty incidence vary by state but are likewise high. More than half of the coastal households in select states are extremely vulnerable [47][48]. Usually, these families do not have collateral which leads to them being excluded from most forms of conventional banking. Certain microfinance programs have started to highlight fisherfolk as a group that demands priority. The Asian Development Bank states that microfinance based services as well as financial inclusion is vital for the fisherfolk's resilience [49].

5.1.2 Digital Microfinance Penetration

In the Philippines there has been a rise in the usage of mobile wallets, as well as agent banking in rural areas. Specificity is scarce when it comes to fisherfolk usage data, but the Gcash-Mayani initiative has been one big case of targeted digital outreach. The digital finance penetration is overall higher in India. UPI usage has went from nothing to more than 8 billion per month within the span of a few years.

Lots of fisherfolk families have smartphones and bank accounts. Financial-Technology (Fintech) applications have been advertising small microloans across the nation which helps them, by implication, reach fisherfolk. For example, surveys of Andhra fishers showed that a growing minority have tried digital lending apps for quick capital.

5.1.3 Types of Products

Traditional credit for fisherfolk in both nations includes in it concepts such as cooperatives, moneylender loans, and in kind credit which is credit tied to the sale of fish. New concepts in credit include mobile banking services, digital loans, as well as group loans that combine savings.

One innovation that is often cited is the commitment savings account, wherein banks or MFIs offer accounts where one cannot withdraw money until it reaches a set date or amount. In rural Malawi, farmers that had such accounts made bigger agricultural investments [50].

5.1.4 Behavioural Nudge Outcomes

Studies in analogous settings confirm that nudges can improve financial behaviors. SMS reminders, goal-setting prompts, and simplified messaging have increased deposits and reduced withdrawals [51]. Messages highlighting percentage savings or providing action steps have cut delinquency rates in US loans [52]. In a field experiment in Liberia, text message nudges doubled average weekly savings relative to control [53].

We found no published experiment specific to fishers, but one can infer that fishers, like other low-income groups, would benefit from reminders before known risks.

5.1.5 Key Constraints

Distance to bank branches, low literacy, and opportunity costs limit uptake of digital finance. Qualitative studies in the Philippines note that many fishers distrust formal lenders and are unaware of products [54]. In India, even with smartphones, older fishers may not fully understand app-based services. Infrastructure issues like poor network also hamper adoption.

The comparative picture shows that India's rapid fintech innovation has greatly expanded theoretical access to credit and payments, but also introduced risks of over-indebtedness [55]. The Philippines has more nascent digital adoption in fisheries, but benefits from focused NGO programs and mobile wallet platforms. Both countries recognize the importance of climate adaptation for fishers, and both link financial inclusion to resilience [56][57].

5.2 Illustrative Figures and Statistics

Poverty: Filipino fisher poverty is 34%, whereas Indian fisher poverty is similarly elevated.

Loan Portfolios: Philippine microfinance outstanding lies at ₱406.7B as of Mar 2022 [59]. Whereas India's top MFIs have portfolios in thousands of crores, which includes rural credit.

Clients: Philippines has 9.1 million unique microfinance clients as of 2020 [60]. Comparatively, India has 414 million Jan Dhan bank accounts as of 2023, many of which, though, are dormant. A 2020 study in Tamil Nadu found less than half of fishers used formal banking services [61].

Digital Reach: Philippine financial inclusion stands at 80% of the adult population (2021), similar in India. UPI transactions (India) increased 500% from 2020 to 2023 [62].

These figures underline the scale: millions of fishers in each country stand to be affected by digital finance and nudges. Statistical analysis from referenced studies shows significant effects: e.g. a 42% reduction in delinquencies per 10,000 emails sent [63], An eightfold increase in savings over 3 months with a behavioral program [64]. While such numbers come from other contexts, they suggest the potential magnitude of impact if similar methods were applied in fisheries.

5.3 Discussion

Our review highlights that contextualization is crucial. A mobile text reminder in India may improve loan repayment if fishers have cell phones, but in a remote Philippine village with no signal, community meetings might be the nudge vehicle.

It also shows research gaps: there is a shortage of experimental studies directly targeting fisher communities. Most evidence is either anecdotal (reports of pilot projects) or drawn from adjacent populations (urban poor, farmers).

We did find encouraging developments: the GCash–Mayani credit product [65] is a kind of digitally-enabled value-chain finance, and Rare's savings clubs [66] use community pressure.

Challenges like climate shocks and overfishing link to finance. For example, the CFI report notes that after disasters, fishers often take children out of school or intensify illegal fishing to cope [67]. Financial tools could change those choices. Commitment savings and microinsurance (with nudges to purchase them) are underexplored in fisheries. Some programs offer weather-index insurance to fishers, but uptake is low. Nudges could help here: e.g. bundling insurance with loan applications so that insurance enrolment is the default. This approach would need careful evaluation.

Finally, a key insight is that digital microfinance and nudges are complements, not substitutes. Digital platforms can deliver nudges (via in-app messages), and nudges can drive digital adoption (e.g. a savings challenge sent to app users). Both depend on trust and convenience. Recommendations below synthesize how to integrate these tools effectively.

6. Recommendations

Strengthen Digital Infrastructure in Fisheries Areas. Governments should prioritize expanding mobile broadband to fishing communities. Improved connectivity (through towers or subsidized service) will directly enhance the reach of mobile banking. In areas where smartphones are rare, support for feature phones (USSD-based services) should continue.

Partner Fintech with Local Supply Chains. The Mayani-GCash model in the Philippines is a promising template. In India, similar partnerships could be encouraged (e.g. fish cooperatives integrating with banks via digital platforms). Such public-private programs should use local data (e.g. confirmed purchase orders) to underwrite loans, reducing perceived risk. Government credit guarantee schemes might be extended to cover these digital loans for fishers.

Develop Seasonally-Aligned Products. Financial products should align with the fishing calendar. E.g. loans whose repayment falls after monsoon or ban seasons, or cyclical savings accounts where fishers commit to deposit during good seasons for use later. Technology makes this easier: apps can automatically restrict withdrawals until a set date. These products act as nudges by embedding timing into the product.

Use Behavioral Messaging on Widely Adopted Platforms. Send timed SMS or push notifications for key events: before fishing bans, or when weather alerts arrive. Messages should be

simple, context-specific (local language), and focus on immediate gains. Literature suggests framing (percentages vs rupees) matters [68], so messages could emphasize "X% growth" of savings to increase perceived benefit.

Leverage Social Structures for Nudges. In community settings (barangays, village councils), use respected local figures to nudge behaviors. For instance, fisher association leaders can publicly pledge savings or loan repayments. Displaying anonymous peer statistics ("70% of your cooperative saved last month!") can invoke social proof.

Embed Nudges in Loan Agreements. Microcredit contracts for fishers should include behavioral elements (e.g. set a savings target when taking a loan, default insurance enrollment).

Financial Literacy with Behavior Change. Traditional training programs should be redesigned as interactive experiences, such as mobile games or dramatizations.

Monitor and Evaluate Interventions. Pilot programs should include randomized evaluation.

Regulatory Support and Consumer Protection. India's RBI guidelines are a step; the Philippines could adopt similar protections.

Target Women and Youth in Fishing Communities. Tailored nudges for women (e.g. education savings) and youth (as digital champions) can be transformative.

Integrate Environmental and Financial Nudges. Tie savings/credit to conservation compliance (marine reserves, sustainable practices).

7. Conclusion

This paper compared digital microfinance and behavioral nudges in fisher communities of the Philippines and India. Both countries' fishers face high poverty and exclusion from formal finance, relying heavily on moneylenders. Digital tools are reshaping access: in the Philippines, e-wallets like GCash (linked to supply chains such as Mayani) show promise; in India, UPI and app-based lenders have rapidly penetrated even coastal villages. Yet challenges remain—digital literacy, seasonal income volatility, and over-indebtedness risks.

Nudges represent a complementary solution: reminders, defaults, social norms, and commitment devices can enhance the impact of digital finance by aligning behavior with long-term goals. Evidence from other populations shows significant improvements in savings and repayment when nudges are applied. For fishers, who live with uncertainty and shocks, nudges could support resilience by encouraging precautionary savings and responsible credit use.

The comparative review underscores that context matters. India's large-scale fintech ecosystem requires strong consumer protection and tailored products, while the Philippines benefits from community-based models that could be digitally scaled. In both, integrating financial inclusion with climate adaptation and fisheries management is crucial.

Ultimately, digital microfinance and nudges are not standalone fixes but part of an integrated toolkit. When carefully designed for fisher realities, they hold the potential to reduce vulnerability, empower households, and contribute to sustainable coastal livelihoods.

References

[1] Vivekanandan, V. (2011). *Socio-Economic Status of Marine Fisherfolk in India.* Central Marine Fisheries ResearchI nstitute. Source: http://eprints.cmfri.org.in.

[2] Kurien, J. (2018). *The Commons and the Collective: Fisheries and Cooperatives in India.* Indian Journal of Human Development. Source: https://journals.sagepub.com/home/jhd.

[3] Government of India (2019). *Report of the Expert Committee on Fisheries.* Department of Animal Husbandry, Dairying & Fisheries.Source: https://dof.gov.in.

[4] Mathew, S. (2016). *Cooperatives and Collective Action in Indian Marine Fisheries.* Marine Policy. Source:https://www.sciencedirect.com/journal/marine-policy.

[5] Thomas, M. (2014). *Community-based Fisheries Management in India: Lessons and Challenges.* Journal of Development Studies. Source: https://www.tandfonline.com/toc/fjds20/current.

[6] NABARD (2018). *Self Help Groups in India – A Study of Impact.* National Bank for Agriculture and RuralDevelopment. PDF:https://www.nabard.org/auth/writereaddata/tender/2903185408SHG%20-%20Impact%20Study.pdf.

[7] Deshpande, R. & Arora, S. (2019). *SHGs and Poverty Reduction in Rural India.* Economic & Political Weekly. Source: https://www.epw.in.

[8] Johnson, D. (2017). *Moneylenders and Marine Fishers: Interlocked Transactions in Coastal India.* World Development. Source: https://www.sciencedirect.com/journal/world-development.

[9] Sundaram, R. (2022). *Digital Lending and Financial Inclusion in India.* Economic Survey of India. Source: https://www.indiabudget.gov.in/economicsurvey/.

[10] Reserve Bank of India (2022). *Guidelines on Digital Lending.* RBI Press Release. Source: https://rbi.org.in/Scripts/BS_PressReleaseDisplay.aspx?prid=53823.

[11] Andhra Pradesh Fisheries Department (2023). *Annual Report on Coastal Fishing Communities.* Govt. of Andhra Pradesh. Source: https://fisheries.ap.gov.in.

[12] Bangko Sentral ng Pilipinas (2018). *Philippine Financial Inclusion Strategy.* BSP Report. Source: https://www.bsp.gov.ph/FinancialInclusion/.

[13] Mayani & GCash (2023). *Press Release: Partnership for Fisheries Credit.* GCash Official Website. Source: https://www.gcash.com/press.

[14] Karlan, D., McConnell, M., Mullainathan, S., & Zinman, J. (2016). *Getting to the Top of Mind: How Reminders Increase Saving.* Management Science. DOI: https://doi.org/10.1287/mnsc.2016.2478.

[15] Agarwal, S., Chomsisengphet, S., Mahoney, N., & Stroebel, J. (2017). *Do Banks' Reminder Emails Reduce Delinquency?* American Economic Review. DOI: https://doi.org/10.1257/aer.20150586.

[16] Philippine Statistics Authority (2021). *Poverty Among Farmers and Fisherfolk.* PSA Official Report. Source: https://psa.gov.ph/poverty-press-releases.

[17] World Bank (2023). *World Development Indicators: Population and Density.* Source: https://data.worldbank.org/indicator/EN.POP.DNST.

[18] Greenpeace Philippines (2019). *Fisherfolk and Climate Risks.* Greenpeace Southeast Asia Report. Source: https://www.greenpeace.org/southeastasia/publications/.

[19] Bureau of Fisheries and Aquatic Resources (2022). *Closed Season Policies.* Govt. of the Philippines. Source: https://www.bfar.da.gov.ph.

[20] FAO (2022). *Fisheries and Aquaculture in the Philippines.* Food and Agriculture Organization. Source: https://www.fao.org/countryprofiles/index/en/?iso3=PHL.

[21] Center for Financial Inclusion (2024). *Finance and Resilience in Philippine Fishing Communities.* CFI Report. Source: https://www.centerforfinancialinclusion.org/research.

[22] Llanto, G. (2017). *Barriers to Financial Inclusion in Philippine Coastal Areas.* Philippine Institute for Development Studies. Source: https://pids.gov.ph/publications.

[23] GCash–Mayani (2023). *Official Partnership Announcement.* Mayani Press Office. Source: https://mayani.ph/press.

[24] Microfinance Council of the Philippines (2022). *State of Microfinance Industry Report.* MCPI. Source: https://microfinancecouncil.org.

[25] FasterCapital (2023). *Case Studies: Digital Microfinance in Southeast Asia.* FasterCapital. Source: https://www.fastercapital.com/blog.

[26] Alamelu, R. & Vimala, S. (2018). *Fisherfolk and Access to Credit in Tamil Nadu.* Indian Journal of Fisheries Economics. Source: http://epubs.icar.org.in.

[27] Rao, P. (2024). *App-based Microcredit in Andhra Pradesh Fisher Villages.* South Asian Development Review.

[28] Reserve Bank of India (2023). *Digital Lending in India – Consumer Protection Framework.* RBI Annual Report. Source: https://rbi.org.in.

[29] Nair, R. (2024). *Banking the Coastal Poor: Study of Kanyakumari Fishers.* Journal of Rural Studies. Source: https://www.sciencedirect.com/journal/journal-of-rural-studies.

[30] MCPI (2022). *Microfinance Portfolio Data*. Microfinance Council of the Philippines. Source: https://microfinancecouncil.org.

[31] Rangarajan, C. (2014). *Report of the Committee on Financial Inclusion*. Government of India. PDF:https://doe.gov.in/sites/default/files/report_on_financial_inclusion_by_committe_on_rangarajan.pdf.

[32] Rare Philippines (2020). *Savings Clubs and Coastal Resilience*. Rare NGO Report. Source: https://rare.org.

[33] RBI (2022). *Digital Lending Framework.* Reserve Bank of India Guidelines. Source: https://rbi.org.in.

[34] Thaler, R. & Sunstein, C. (2008). *Nudge: Improving Decisions About Health, Wealth, and Happiness.* Yale University Press. Source: https://yalebooks.yale.edu/book/9780300122237/nudge.

[35] Stroebel, J. et al. (2017). *Behavioral Interventions in Loan Repayment*. American Economic Review.

[36] Bertrand, M., Mullainathan, S., & Shafir, E. (2006). *Behavioral Economics and Poverty*. American Economic Review.

[37] Karlan, D. & Zinman, J. (2018). *SMS Reminders and Microfinance*. Innovations for Poverty Action.

[38] Allen, H. (2016). *Village Savings and Loan Associations: A Review of Evidence*. SEEP Network.

[39] Ashraf, N., Karlan, D., & Yin, W. (2006). *Tying Odysseus to the Mast: Evidence from Commitment Savings*. Quarterly Journal of Economics.

[40] Rare (2020). *Savings Clubs Data*. Rare NGO.

[41] USAID (2021). *Financial Inclusion and Gender in Philippine Fisheries*. USAID Fisheries Report.

[42] World Bank (2019). *Financial Literacy Edutainment Programs*. World Bank Report.

[43] CFI (2024). *Barriers to Fisherfolk Finance*. Center for Financial Inclusion.

[44] Ideas42 (2019). *Nudges for Youth Savings*. Ideas42 Policy Report.

[45] Harvard Nudge Blog (2020). *Defaults in Savings*. Harvard Kennedy School.

[46] PSA (2021). *Poverty Incidence Among Fisherfolk*. Philippine Statistics Authority.

[47] Rangarajan, C. (2014). *Financial Inclusion in India*. Government of India Report.

[48] Alamelu, R. & Vimala, S. (2018). *Access to Credit Among Fisherfolk*. Indian Journal of Fisheries Economics.

[49] Asian Development Bank (2017). *Microfinance for Coastal Communities*. ADB Technical Report.

[50] Brune, L., Giné, X., Goldberg, J., & Yang, D. (2016). *Facilitating Savings for Agriculture: Malawi Experiment*. American Economic Review.

[51] Dupas, P. & Robinson, J. (2013). *Why Don't the Poor Save More? Evidence from Kenya*. American Economic Review.

[52] Agarwal, S. et al. (2017). *Behavioral Nudges and Loan Delinquency*. AER.

[53] Ideas42 (2019). *Liberia Savings Nudge Study*. Ideas42.

[54] Llanto, G. (2017). *Financial Inclusion in Coastal Philippines*. PIDS.

[55] RBI (2023). *Digital Lending: Risks and Regulation*. Reserve Bank of India.

[56] CFI (2024). *Finance in Conservation Programs*. Center for Financial Inclusion.

[57] RBI (2022). *Agricultural and Allied Sector Lending*. Reserve Bank of India.

[58] PSA (2021). *Fisherfolk Poverty Data*. Philippine Statistics Authority.

[59] MCPI (2022). *Microfinance Industry Statistics*. Microfinance Council of the Philippines.

[60] BSP (2022). *Financial Inclusion Survey Results*. Bangko Sentral ng Pilipinas.

[61] Nair, R. (2024). *Fishers and Formal Banking*. Journal of Rural Studies.

[62] NPCI (2023). *UPI Transaction Data*. National Payments Corporation of India.

[63] Agarwal, S. et al. (2017). *Loan Delinquency and Behavioral Interventions*. AER.

[64] Ideas42 (2019). *Savings Nudges Results*. Ideas42.

[65] GCash–Mayani (2023). *Partnership Details*. Mayani.

[66] Rare (2020). *Savings Club Impact*. Rare NGO.

[67] CFI (2024). *Climate Shocks and Fisher Response*. Center for Financial Inclusion.

[68] RBI (2022). *Seasonal Loan Guidelines*. Reserve Bank of India.