



Using Social Media to Train Farmers

Evidence From Aquaculture Farmers in Bangladesh

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Introduction

In today's digital age, the ubiquity of mobile phones and the internet has revolutionized the way we disseminate information, making interactive social media platforms such as Facebook, Twitter, and YouTube a critical channel for knowledge transfer.¹ The COVID-19 pandemic has only served to amplify this trend, with Facebook alone boasting a staggering 2.9 billion monthly active users worldwide.² Among the beneficiaries of this revolutionary technology are the farmers—the backbone of the global food supply chain. Recent research has shown that mobile application-based training modules can markedly improve the knowledge and output quality of farmers, as evidenced by the grape growers in China.³ Studies from Central Java also confirm that these platforms are a potent tool for knowledge dissemination, leading to improved financial conditions and better outcomes among members of aquaculture community groups on Facebook.⁴ Despite this growing evidence, the use of social media for training purposes in the field of aquaculture in Bangladesh has received limited attention from scholars and policymakers.

Aquaculture plays a crucial role in the Asia Pacific region, as it is vital for enhancing food security, employment, income, poverty reduction, and rural socioeconomic standards.⁵ In

¹ Su, Z., Xu, Q., Zhang, K., & Shen, X. (2016). *Modeling and optimization for mobile social networks*. Springer International Publishing. <https://doi.org/10.1007/978-3-319-47922-4>

² World Population Review. (2023). Facebook users by country 2023. <https://worldpopulationreview.com/country-rankings/facebook-users-by-country>

³ Chua, K., Li, Q., Rahman, K. W., & Yang, X. (2021). Effective training through a mobile app: Evidence from a randomized field experiment [Conference paper]. 2021 Annual Meeting of the Agricultural and Applied Economics Association, Austin, Texas. <https://econpapers.repec.org/paper/agsaaea21/312907.htm>

⁴ Elfitasari, T., Nugroho, R. A., & Nugroho, A. P. (2018). The importance of aquaculture community group (ACG) in social media (Facebook) towards the aquaculture knowledge and financial improvement of small scale fish farmers (SSFF) in rural areas of Central Java. *IOP Conference Series: Earth and Environmental Science*, 137, 012097. <https://doi.org/10.1088/1755-1315/137/1/012097>

⁵ Belton, B., Bush, S., & Little, D. (2017). Not just for the wealthy: Rethinking farmed fish consumption in the Global South. *Global Food Security*, 16, 85–92. <https://doi.org/10.1016/j.gfs.2017.10.005>; Food and Agriculture Organisation. (2020). The state of world fisheries and aquaculture 2020: Sustainability in action. <https://doi.org/10.4060/ca9229en>

Bangladesh, inland fish production accounts for 57% of the total fish production, with 79% of it coming from ponds.⁶ However, an assessment of the risk, efficiency, and variations in input use shows that farmers in Bangladesh tend to use inputs sub-optimally,⁷ and this inefficiency may be mitigated through access to technical know-how acquired through training and extension services. The adoption of new technologies in aquaculture, such as improved feed and feeding methods, better production processes, and disease management, as well as genetically enhanced fish strains, has the potential to significantly boost aquaculture production, particularly in shrimp, salmon, and tilapia.⁸ However, for these technologies to be adopted effectively, farmers need to be made aware of their existence.⁹ Social media platforms such as Facebook can play a pivotal role in disseminating information about fish farming to farmers in Bangladesh. Remarkably, 89% of the Bangladeshi population owns mobile phones, with 35% having access to the internet and 71% of those with internet access using Facebook as a communication platform, making it an accessible and efficient tool for knowledge transfer.¹⁰

⁶ Department of Fisheries Bangladesh. (2021). Yearbook of fisheries statistics of Bangladesh 2019-20 (No. 37). Ministry of Fisheries and Livestock, Bangladesh.

⁷ Khan, M. A., Begum, R., Nielsen, R., & Hoff, A. (2021). Production risk, technical efficiency, and input use nexus: Lessons from Bangladesh aquaculture. *Journal of the World Aquaculture Society*, 52(1), 57–72.

⁸ Kumar, G., & Engle, C. R. (2016). Technological advances that led to growth of shrimp, salmon, and tilapia farming. *Reviews in Fisheries Science & Aquaculture*, 24(2), 136–152.

⁹ Kumar, G., Engle, C., & Tucker, C. (2018). Factors driving aquaculture technology adoption. *Journal of the World Aquaculture Society*, 49(3), 447–476. <https://doi.org/10.1111/jwas.12514>

¹⁰ Hassan, M. M., Aziz, S. S., Mozumder, T. A., Mahmud, E., Khan, I., & Razzaque, F. (2020). The state of Bangladesh's political governance, development, and society: According to its citizens [National survey report]. The Asia Foundation.

Method

In order to explore the efficacy of using digital platforms as a training delivery mechanism and assess the impact of such interventions on the knowledge and practices of aquaculture farmers in Bangladesh, we have partnered with The Right Kind (TRK) to conduct a farmer-level randomized controlled trial (RCT) across three sub-districts of Rajshahi, a northern district in Bangladesh. TRK supports development partners with project implementation and strategic support. They have experience working in the field with agriculture and aquaculture farmers regarding financial inclusion, digital connectivity and nutrition.

Our goal is to evaluate the effectiveness of the one-to-one training and information provided to aquaculture farmers about joining a Facebook group called The Right Fish (TRF), which provides relevant information about fish farming. TRF is a restricted group where individuals affiliated with aquaculture farming verified by TRK may join. The group currently has more than 12,000 fish farmers. The apt monitoring of the membership to the group ensures that the right people are a part of the group – this is rather essential for research conducted on any such digital intervention. The content of this group is curated by TRK. They arrange for expert suggestions to be given to the farmers through a Facebook account (also a member of TRF) with “Dr. Fish” as a pseudonym. If this intervention proves to be successful, it could be scaled up to include farmer training initiatives throughout Bangladesh.

Between April and August of 2022, we enrolled 1,237 fish farmers who had access to smartphones. Trained TRK members with more than 10 years of experience visited the households of each of the farmers and verified if the household owned a smartphone. Thus, ensuring the sample consists of genuine aquaculture farmers with access to smartphones. During this enrolment survey, we randomly assigned the farmers to either the treatment (628) or control (609) groups. TRK members then introduced the treatment group farmers to TRF, added them to the Facebook group, and explained how to use it. Meanwhile, control

group farmers were only informed that we represented TRK. Because TRF is a restricted Facebook group, only those individuals added to the group have access to its contents. We used the basic information collected during the selection process as a baseline.

In October 2022, we conducted a phone survey to reach 562 treatment and 524 control farmers to assess the intervention's take-up and knowledge acquisition relevant to fish farming using social media. Further research is going on to examine the translation of knowledge into practice and the resulting economic benefits.

Characteristics of the Study Participants

The two groups of aquaculture farmers participating in the study are found to have similar socio-economic characteristics, as expected due to random allocation into treatment and control. Specifically, the farmers in both groups have analogous demographic characteristics, fish production levels, and rates of internet usage. On average, the farmers are approximately 39 years old and have attained about 11 years of formal education. They possess around five acres of water bodies that are appropriate for aquaculture, and they typically generate approximately BDT 2 million in revenue per year from their operations. Moreover, their average monthly expenditure on internet amounts to approximately BDT 380. It is noteworthy that almost all households (95%) have access to Facebook, with about half of them (47%) making inquiries related to fish farming online.



Results and Discussion

Our analysis reveals that the training motivated the treatment group to utilize social media (TRF on Facebook) to engage with other fish farmers, gather information about aquaculture, and enhance their knowledge of some farming practices. Specifically, the training resulted in a six-percentage-point increase in the likelihood of treatment group farmers using social media for aquaculture-related purposes. Furthermore, our results show that the intervention has a larger effect on the exchange of information through social media than on the trade of goods pertinent to fish farming.

Interestingly, we find that significant impact of the training on the likelihoods of reading social media posts. This effect is 10 percentage points, and higher than that of creating posts (five percentage points), and in turn, it is larger than that of trading fish fingerlings online (three percentage points). (as shown in Figure 1). The impact of the intervention on receiving information through social media suggests that it may complement traditional outreach activities for aquaculture farmers by providing a more accessible platform for such endeavours.

Further analysis indicates that the intervention increased the probability of acquiring knowledge about fish farming from online posts in both static (including written posts, infographics, pictures, etc.) and video form by one percentage point. However, the effect was more substantial for static posts alone, with an increase of ten percentage points (as illustrated in Figure 1). These results suggest that the dissemination of knowledge through social media posts is more effective when presented in static form.

In addition, we check if the impact is different for farmers who own smartphones. We find that there is an additional impact on the likelihood of using social media for fish farming-related purposes for farmers who own smartphones themselves. These findings highlight the manner in which information is most effectively accepted and retained among farmers.

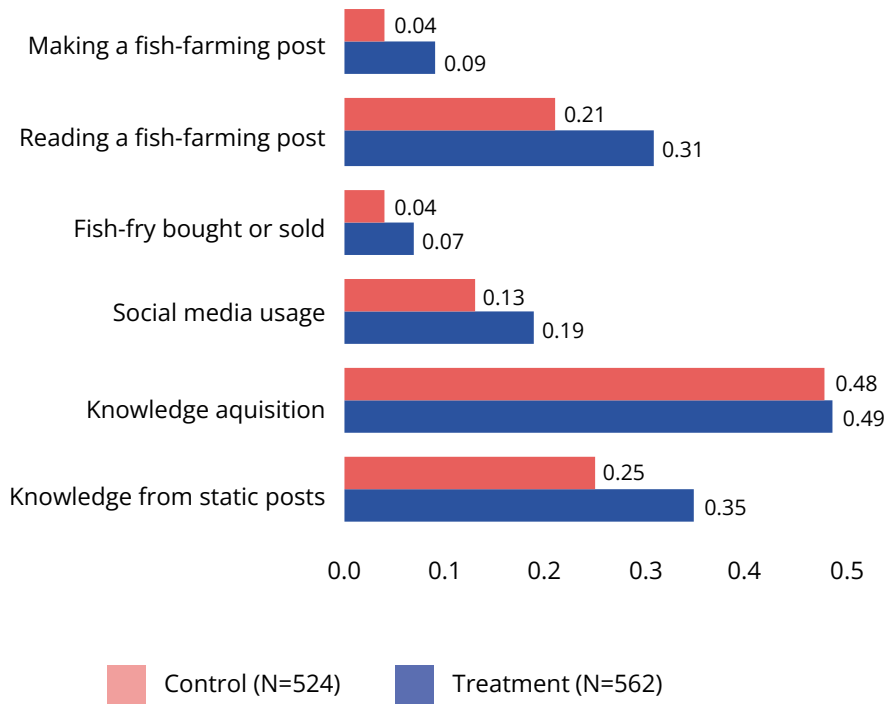


Figure 1. Likelines of Social Media Usage and Knowledge Aquisition



Conclusion and Next Steps

Based on the findings, it is evident that the social media training provided by TRK has a positive impact on the relevant farmers in Bangladesh. The results suggest that the use of social media, particularly short and concise static posts, can be an effective tool for providing knowledge and information to the relevant farmers and that it can complement more traditional methods of extension and outreach activities. This provides a promising platform to reach and train rural farmers which may even go beyond fisheries. Moreover, the impact of the training on the usage of social media for networking and accessing information, as well as the subsequent acquisition of knowledge, is considerably higher for farmers who own smartphones themselves, highlighting the importance of selecting farmers based on this criterion.

Moving forward, to measure the economic benefits of this training, further research is being carried out. It will enable us to determine how much of the new knowledge is being put into practice by farmers and the economic benefits they obtain.



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