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E-Commerce for Agricultural Marketing and Food Access during COVID-19: The Rezeki Bersama Farmer Group in Bengkulu

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Abstract

This study examines conventional marketing constraints, introduces e-commerce to a local farmer group, and assesses which outcomes are actually evidenced by a community-based intervention during the COVID-19 pandemic. The case concerns the Rezeki Bersama Farmer Group in Beringin Raya, Bengkulu City, Indonesia. An evaluative descriptive qualitative approach interprets observations, discussions, training practice, website documentation and the programme narrative through the Technology Acceptance Model (TAM), without testing its constructs statistically. Conventional outlets depended on traditional markets and roadside sales, whereas the programme introduced internet searches and demonstrated a vegetable-sales website with a product catalogue and shopping cart. The available records substantiate training exposure and a demonstration interface, but do not verify routine live transactions, stock updating, payment settlement, delivery performance, post-programme use or changes in sales and household food access. The study distinguishes technology awareness, demonstrated operational skills and sustained commercial adoption. Its contribution is an evidence-sensitive framework linking farmer capacity building to the operational readiness necessary for sustainable agricultural e-commerce. Practical recommendations address delegated website administration, stock and price control, order fulfilment, payments, delivery and ongoing mentoring.

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INTRODUCTION

COVID-19 disrupted the ways households obtained essential goods while also disrupting the channels through which agricultural producers reached consumers. Restrictions on movement and avoidance of crowded places reduced opportunities for face-to-face exchanges, yet demand for vegetables and other food products did not disappear. Indonesia's statistical agency documented changes in mobility and online consumer activity during the early pandemic (Badan Pusat Statistik, 2020). International

evidence similarly shows how pandemic-related shocks compelled food suppliers to reconsider distribution flexibility and the use of online channels (Hobbs, 2020, 2021). These developments make agricultural marketing an important issue for community welfare: continued production is insufficient unless products can be communicated, ordered and delivered to households reliably.

The Rezeki Bersama Farmer Group in Beringin Raya, Bengkulu City, provides a local illustration of this challenge. According to the submitted programme narrative, its members cultivated and sold vegetables primarily through traditional markets and roadside displays. Such outlets depended on customers visiting physical selling points. During restrictions on movement, that dependence became a marketing vulnerability. The record also describes limited familiarity among some members with internet-based information gathering and digital marketing. It does not, however, contain a systematic inventory of member-owned devices, measured connection speeds, connectivity costs or other infrastructure characteristics. Consequently, this study identifies limited documented digital marketing experience and a reliance on physical markets as established constraints, while treating hardware and network deficiencies as questions requiring further assessment rather than proven conditions.

E-commerce offers a means to display products and communicate with potential buyers without making the initial exchange dependent on a physical market visit (Turban et al., 2002; Putra, 2019). Agricultural e-commerce nonetheless requires more than a visible website. Stock quantities must match the harvest, changing prices must be communicated accurately, orders must be accepted and fulfilled, and customers need workable payment and delivery arrangements. These requirements are especially significant for vegetables, which are vulnerable to quality deterioration during storage and distribution (Aung & Chang, 2014). Grocery fulfilment literature demonstrates that the design of the order-picking and last-mile delivery process is integral to the viability of online sales (Hübner et al., 2016).

Prior studies provide a foundation but also leave a gap at the point where technology awareness becomes operational market participation. Putra (2019) examined agricultural marketing strategies involving e-commerce. Bahtera et al. (2019) examined perceived usefulness and ease of use among pepper farmers, and Zarei et al. (2022) tested an extended Technology Acceptance Model (TAM) in a different agricultural setting. Broader scholarship stresses the social and organisational conditions of digital agricultural transitions (Klerkx et al., 2019). These studies do not, by themselves, establish whether an outreach programme that demonstrates a website has created a sustained, functioning sales channel. That distinction is particularly important when a community intervention has no transaction logs, post-training follow-up data or structured TAM measures.

The present study responds to this empirical and analytical gap by reassessing evidence from the Rezeki Bersama programme. Its purpose is not to claim that the intervention improved sales, but to explain what was implemented, what capabilities can reasonably be inferred from observations, and what operational prerequisites remain. This contributes to the scope of social welfare and community development by addressing farmers' digital capacity and potential market resilience while distinguishing the possibility of improved food access from measured improvements in food distribution. The proposed contribution is a three-level distinction between understanding digital technology, demonstrating basic website operation and sustaining real marketing transactions.

Three research questions guide the article: (1) What conventional marketing constraints and technology-related obstacles were documented for the Rezeki Bersama Farmer Group during COVID-19, and which potential barriers remain unmeasured? (2) How did training, internet practice and website demonstrations contribute to initial digital understanding and operational capability? (3) What evidence supports the website's implementation and potential marketing benefits, and what operational and sustainability conditions would be necessary to assess actual commercial use and community food access? The corresponding objectives are to characterise the initial situation, interpret the intervention through TAM and evaluate its observable outputs against the evidence required for claims of sustained adoption and market or welfare impact.

LITERATURE REVIEW

Technology Acceptance and Farmer Capacity Building

Davis (1989) proposed that perceived usefulness and perceived ease of use are central to the acceptance of information systems. Usefulness refers to the belief that a system enhances the performance of relevant tasks, whereas ease of use refers to an expectation that its operation will not demand excessive effort. In agricultural settings, these perceptions may arise when farmers discover that internet searches provide useful cultivation or market information and that a website allows them to display or select produce. Evidence from Indonesian pepper farmers and from agricultural e-commerce users elsewhere shows the relevance of these constructs, alongside support and facilitating conditions (Bahtera et al., 2019; Zarei et al., 2022).

TAM is used here exclusively as an interpretative lens for qualitative activities. The intervention did not employ validated questionnaire items, measure the latent constructs, estimate relationships between constructs or establish behavioural intention scores. Observation of a participant navigating a page cannot therefore be equated with a verified rise in perceived ease of use. More precisely, the programme created experiences that can be discussed in relation to the two TAM constructs. This qualified reading avoids replacing missing psychometric or behavioural data with theoretical inference.

Capacity building is best treated as a progression rather than as a single outcome. The first level is conceptual understanding: farmers recognise possible uses of internet searches, online catalogues and digital sales. The second is demonstrated operation: participants can complete guided tasks such as opening pages, identifying products and using a shopping-cart interface. The third is sustainable adoption: group members independently maintain current listings, accept and fulfil orders, reconcile payment and delivery, resolve problems and continue such activity after external assistance ends. A short training session and a website screenshot may support the first two levels to a limited extent, but cannot establish the third. This distinction corresponds to calls for digital agricultural studies to account for the social and organisational dimension of technological change (Klerkx et al., 2019).

Agricultural E-Commerce as an Operational System

E-commerce encompasses the exchange of information, goods and services over electronic networks, including customer interfaces and underlying transaction processes (Turban et al., 2002). For a small farmer group, a product catalogue and cart can constitute a useful prototype or customer-facing front end. They do not, on their own, prove that a complete ordering workflow exists. Operational readiness also depends on

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the availability of products, accuracy of inventory and prices, timely confirmation of customer requests, acceptable payment options, and effective order delivery.

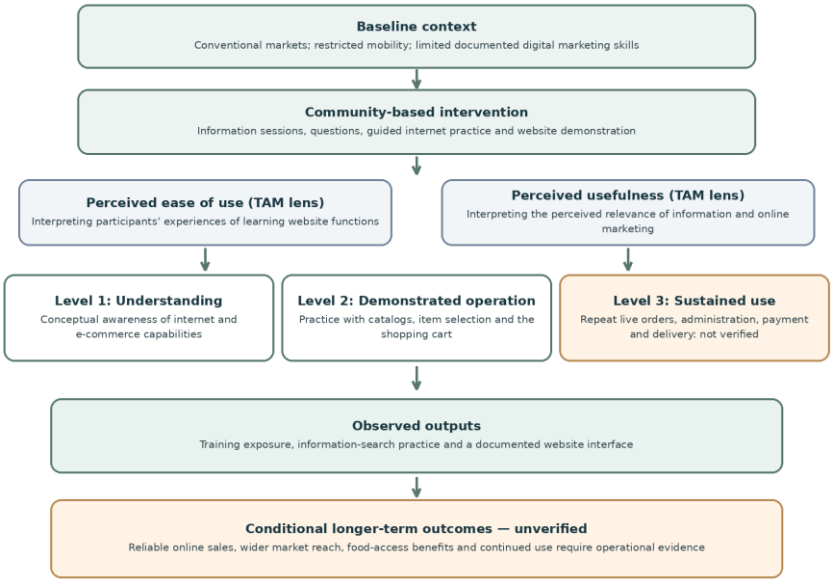
Fresh produce creates specific fulfilment risks. Vegetable varieties differ in harvesting cycles, quantities and perishability; overstated stock or delayed delivery can quickly undermine quality and trust. Aung and Chang (2014) explain the importance of managing time and temperature throughout perishable-food supply chains. Hübner et al. (2016) demonstrate that online grocery retailing requires explicit choices about picking, distribution and delivery. These insights are not evidence that such systems were installed in Rezeki Bersama; they justify including stock and fulfilment requirements in a readiness assessment.

Payments represent another potential adoption barrier. Digital payment availability and competence can influence whether online ordering is accessible to producers and consumers. The Global Findex report documents changes in digital payment participation around COVID-19 (Demirgüç-Kunt et al., 2022). Research with farmers in Bangladesh identifies limited confidence and security concerns despite widespread exposure to digital financial services (Prodhan et al., 2024). Such findings establish why payment procedures and training merit investigation, not that the farmer group experienced the same problems.

Conceptual Framework and Propositions

Figure 1 differentiates the intervention pathway from operational adoption. Baseline constraints motivate an educational intervention. Participants' exposure to internet practice and website demonstrations is interpreted, cautiously, through TAM. Outcomes are then separated into conceptual understanding, demonstrated operation and sustained commercial use. A documented interface indicates a potential digital sales channel, but evidence of independent use and fulfilled orders is required before claiming durable adoption or food-access effects. The framework proposes a plausible pathway for subsequent evaluation rather than testing causal relationships in the present study.

Figure 1. Evidence-Sensitive Conceptual Framework of Agricultural E-Commerce Capacity Building



Source: Developed by Author

The framework yields three analytical propositions for future research. P1: guided practice may support digital understanding when tasks are directly linked to farmers' needs. P2: the ability to demonstrate website functions does not necessarily imply independent, sustained use in commercial transactions. P3: operational routines for stock, pricing, orders, payment, delivery and technical maintenance are preconditions for evaluating whether adoption generates measurable market or welfare benefits. These propositions are interpretive statements and were not tested statistically in the case.

METHODS

Research Design and Setting

This study uses an evaluative descriptive qualitative case approach grounded in the community outreach activity reported for the Rezeki Bersama Farmer Group in Beringin Raya, Bengkulu City, Indonesia. The activity took place in the context of the COVID-19 pandemic; the source does not specify a date precise enough to report here. It combined introductory instruction, questions and answers, guided internet practice, simulation and presentation of a vegetable-sales website. The unit of analysis is the group-level intervention and its documented outputs, rather than individual technology acceptance scores or the financial performance of a commercial enterprise.

The programme materials describe the participants as group members, but do not provide a verified number of attendees, their demographic characteristics, a formal sampling frame or duration of follow-up. No figures have been inserted to compensate for these omissions. Likewise, the method does not imply pretest–posttest, a control group or systematic longitudinal interviews, none of which are documented. This delimitation is necessary to keep the evaluation reproducible and proportionate to the available evidence.

Data Sources, Collection and Analytical Procedure

The analysis draws on the qualitative evidence available in the submitted manuscript: the description of the group's initial marketing practices; accounts of observation, discussions and questions and answers during training; descriptions of internet practice; visual documentation of an outreach session; and screenshots of a vegetable website showing a home page, product catalogue and shopping cart. The case narrative additionally reports a positive reception and greater online sales, but does not supply transaction counts, sales values, dates or independent corroboration. That narrative claim is therefore recorded as unverified rather than presented as a measured result.

Material was organised into categories derived from the research questions: initial marketing configuration, skills and possible infrastructure constraints, training activities, available interface evidence, levels of capability, and operational conditions for sustainable adoption. Interpretive thematic comparison was informed by the principles of transparent qualitative coding (Braun & Clarke, 2006), while TAM served as a sensitising conceptual framework rather than a psychometrically measured theory. The analysis distinguishes direct documentation, descriptive statements in the original case narrative, inferences supported by those statements, and proposals informed by external literature. It does not report inter-coder agreement, member checking or participant quotations that were not preserved in the source.

Credibility was pursued by checking whether claims were supported by more than one type of available material, especially the alignment between programme

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descriptions and website or outreach images. This is a limited documentary triangulation, not a substitute for access to original observation notes, server records or participant interviews. Claims concerning device ownership, connectivity, live website transactions and post-project performance were explicitly coded as "not established" where evidence was absent.

Table 1. Evidence-Based Diagnosis of Barriers and Operational Readiness

Constraint or Readiness Area	Evidence in the Source	Interpretation and Remaining Assessment
Physical-market dependence	Traditional market and roadside selling were described.	Documented marketing constraint; motivates alternative contact and ordering channels.
Digital skills	Initial use was described as limited; training and guided practice were documented.	A baseline skills constraint is supported, but proficiency and independent use were not scored.
Devices and internet quality	Computers/laptops were used in the activity; no member-level inventory or speed test is available.	Resource availability, individual access, network stability and data affordability remain unassessed.
Website and transaction systems	Screenshots show catalogue and cart interfaces.	A demonstration interface is evidenced; public access and successful live orders are not verified.
Payments, packing and delivery	No procedures, fulfilment logs or transaction records are supplied.	Cannot determine readiness or actual operation; these are priority follow-up checks.

Table 2. Alignment of Research Questions, Evidence and Analysis

Research Question	Available Evidence	Approach and Inferential Limit
RQ1. Initial barriers and constraints	Market description, initial observations and training rationale	Descriptive assessment; no device/connectivity audit was supplied.
RQ2. Learning and initial operation	Outreach documentation, practical activities and interface screenshots	TAM-informed thematic interpretation; no measured TAM scores or competency test.
RQ3. Implementation and benefits	Website features, programme narrative, absent transaction data	Evidence audit plus literature-informed readiness assessment; no verified impact estimate.

Analytical Criteria and Research Ethics

To maintain conceptual clarity, technology awareness was defined as recognition or explanation of digital functions; demonstrated operation as observed or narrated performance of guided tasks; and sustainable adoption as independently repeated, maintained and documented use in real market exchanges. The third criterion would require such evidence as live product listings, order identifiers, fulfilment records, successful settlement and follow-up activity. These records were not available to the present evaluation. The manuscript reports only existing programme documentation and scholarly sources; no additional participant interviews or personal data collection were carried out for this revision. Any further prospective field evaluation should obtain appropriate institutional permission, informed consent and secure handling of financial and customer data.

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RESULTS AND DISCUSSION

Observed Results: Marketing Situation and Educational Intervention

The case narrative locates the initial marketing problem in a mismatch between an ongoing supply of vegetables and the group's reliance on transactions initiated in physical locations. The Rezeki Bersama Farmer Group marketed vegetables through conventional markets and roadside displays, which exposed sales activity to fluctuations in customers' willingness or ability to visit those locations during the pandemic. This finding concerns access to the market interface, not inadequate production. It supports a rationale for exploring digital product discovery and ordering alongside existing outlets.

The original documentation depicts introductory outreach and computer-based practice. Training activities included explanations of information technology and e-commerce, a question-and-answer format, internet searches for agricultural information and simulated navigation through a vegetable-sales website. The available narrative reports that participants began to understand internet-based information searches and basic e-commerce features. Because the source contains neither a task-by-task performance checklist nor independently administered assessments, this is best described as observed or reported introductory learning, not as a quantified competency gain.

Figure 2. Information Technology Outreach and Practical Training Session



Source: Developed by Author

Implementation Status of the Website

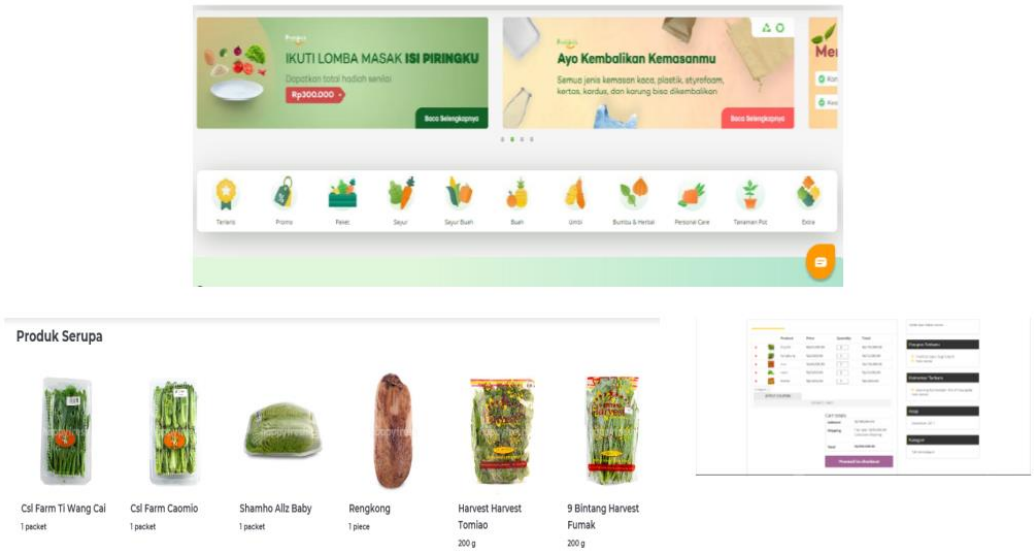
The website image documents an interface for vegetable sales with an entry page, product catalogue and a shopping-cart screen where selected items, quantities and prices are displayed. Its presence is stronger evidence than a purely verbal description of e-commerce: there was a visible system available for demonstration. Nevertheless, the documentation does not identify whether the website was publicly accessible to consumers, whether a customer successfully checked out, or whether a farmer received, packed and delivered an order through it. The safest classification is therefore a "documented demonstrator with potential sales-channel functions"; fully operational commercial deployment remains unverified.

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This classification resolves an important ambiguity in the original description. The source narrative mentions good reception and increased online sales, but without verifiable dates, counts, value, sales-channel definitions, invoices or application logs. It is not possible to reconcile that statement with independently observable transactions. The study retains it solely as an unverified programme report and does not claim an increase in sales, customers or revenue. Similarly, the presence of a product catalogue does not verify that members routinely updated stock or that prices reflected real-time availability.

Figure 3. Vegetable E-commerce Interface: Product Catalogue and Shopping Cart



Source: Developed by Author

Table 3. Observed Outputs and the Limits of Outcome Claims

Outcome or condition	What the available evidence supports	What cannot be concluded
Awareness and digital information	Participants were introduced to internet searches for agricultural needs.	Independent post-training digital literacy levels or measured gains.
Website operation	A catalogue and cart were demonstrated; guided activities are described.	That all members could independently operate the system.
Commercial implementation	A website interface with commerce-oriented functions existed.	Public live operation, recurring orders, payments or deliveries.
Sales impact	The narrative reports a favourable response and increased online sales.	Amount, percentage change, causal effect, net income or customer growth.
Food access	Digital ordering could reduce reliance on initial physical-market contact.	Actual increases in food availability, affordability or distribution to households.
Long-term adoption	The intervention included training and demonstration.	Sustained use, maintenance or financial viability after programme completion.

Discussion of RQ1: Locating the Main Constraints

The clearest evidence-based constraint was not a demonstrated shortage of computers or an objectively poor internet connection; it was a marketing model that

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relied on physical buyer presence combined with the group's limited recorded experience of digital selling. The outreach team could make equipment available for the training session, but that observation alone says little about whether members owned suitable devices, could afford data packages or enjoyed reliable connectivity outside the session. Future programmes should begin with a simple member-level diagnostic: device access, network reliability, data affordability, account ownership, digital literacy and the existing workflow for harvesting and delivering vegetables. Without this diagnosis, a website-based solution may be technically available yet mismatched to the group's operational capacity.

This distinction matters theoretically and practically. Davis's (1989) TAM can explain why usefulness and ease of use might influence willingness to adopt a technology, but these perceptions cannot overcome unavailable infrastructure or a missing fulfilment process. The extension examined by Zarei et al. (2022) highlights the relevance of facilitating conditions for agricultural users. In Rezeki Bersama, however, the existing evidence permits only a limited statement about learning needs. A claim that internet speed or device ownership caused underutilisation would exceed what was recorded.

Discussion of RQ2: Learning, Technical Operation and Technology Acceptance

The case suggests why practical demonstrations are useful in farmer-centred digital outreach. Internet searches make an unfamiliar technology relevant to everyday production questions, whereas catalogue and cart demonstrations connect technology to marketing activities already recognised by participants. In TAM terms, the first experience is plausibly related to perceived usefulness and the second to perceived ease of use (Davis, 1989). This is an interpretation of programme design and observed participation; there are no validated participant ratings by which to infer that either construct increased.

The revised three-level distinction makes the boundary of the result explicit. Understanding what e-commerce offers is not equivalent to completing a sale. Performing steps under supervision is not equivalent to updating stock or resolving failed payments without assistance. Similarly, a successful demonstration in a computer room is not evidence of continued use after the trainers depart. The observed educational output is therefore meaningful but preliminary. This reading is consistent with the broader digital agriculture literature, which argues that technology transitions depend on institutional, organisational and social capacity, not merely artefact availability (Klerkx et al., 2019).

Discussion of RQ3: Marketing Potential and Food Access

The availability of a catalogue and cart creates a plausible mechanism for reducing reliance on physical markets at the information and ordering stages. Consumers might locate products remotely, determine quantities and communicate demand in advance. Such a mechanism could increase marketing flexibility when movement is restricted. Yet the commercial value of this mechanism depends on reliable fulfilment: product availability must be current, orders must reach the responsible farmer, payments must be workable and perishable goods must arrive in satisfactory condition. Grocery fulfilment research indicates that these downstream activities require explicit system design rather than automatic assumptions based on the front-end interface (Hübner et al., 2016).

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In the case of fresh vegetables, harvest fluctuations and rapid spoilage make inventory and delivery reliability especially important. Theoretical guidance on perishable-food handling recommends minimising avoidable delays and accounting for quality deterioration across the supply chain (Aung & Chang, 2014). These recommendations should be adapted to local conditions and cannot be described as established practices at Rezeki Bersama. Likewise, findings concerning farmers' difficulties with digital financial services (Prodhan et al., 2024) and the growth of digital payments during the pandemic (Demirgüç-Kunt et al., 2022) support the inclusion of secure payment training, but do not establish a payment method used by this group.

The welfare significance should be interpreted with similar restraint. A more accessible route for discovering and ordering vegetables could help households obtain food without needing to visit a particular stall. However, no evidence is available concerning actual orders delivered, households served, delivery areas, fulfilment times, food prices or food security indicators. The programme may have opened an opportunity for market access; it did not provide sufficient evidence to demonstrate that community food needs were fulfilled or that the distribution of fresh produce improved. This limitation is central to an academically valid conclusion, rather than a reason to disregard the relevance of the intervention.

Practical Sustainability Strategy: From Demonstration to Routine Use

To move from educational exposure to sustained commercial use, the group would need a manageable operating model with named responsibilities and verifiable routines. The first step is to appoint an accountable website coordinator and a backup; the second is to link website listings to harvest and inventory information; the third is to establish an order-confirmation and fulfilment procedure. A small-scale pilot with documented transactions would be more defensible than immediately assuming broad market adoption. Pricing, payments, delivery and customer communication should be tested with actual consenting customers before the website is described as an operating commercial channel.

Website sustainability also has a social dimension. A coordinator should not become the only person who can access and maintain the platform. Rotating practice sessions, written instructions, backup credentials stored securely, and a basic troubleshooting protocol can distribute capabilities across the group. External partners could offer periodic support, but ordinary functions—stock updates, product photos, price corrections and confirmation messages—should be feasible for designated members. The planning proposals in Table 4 are based on the literature and the gaps identified in the submitted materials; they are not interventions already observed in the case.

Table 4. Proposed Operational Responsibilities and Sustainability Indicators

Operational Area	Proposed Group Routine and Role	Evidence for a Future Evaluation
Governance and access	Appoint website administrator and backup; document permissions and responsibilities.	Named role roster, access/maintenance log and periodic handover records.
Product stock and freshness	Assign harvest/stock recorder; update available quantities and remove sold-out products before ordering windows.	Timestamped inventory changes, stockout records and product condition notes.

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Operational Area	Proposed Group Routine and Role	Evidence for a Future Evaluation
Price transparency	Designate pricing reviewer; display current per-unit prices, delivery fees and validity periods.	Price revision log and customer order-to-price reconciliation.
Order processing	Identify order coordinator; confirm requests, pick/pack produce and notify buyers of substitutions.	Order IDs, confirmations, fulfilment time, cancellations and complaint records.
Payment controls	Offer feasible documented payment options; reconcile receipts and train members in account security.	Settlement records, failed-payment reports and reconciliation checklist.
Delivery and product quality	Select pickup or local delivery rules; agree radius, dispatch times and handling procedures.	Delivery status, time, completeness and quality/return reports.
Site maintenance and mentoring	Schedule backups, link checks, device/internet support and refresher training.	Uptime records, issue log, repeat independent use and post-programme follow-up.

A subsequent pilot could evaluate the system through simple, consent-based indicators: number of products with current stock records; proportion of orders acknowledged within an agreed time; order completion and cancellation rates; delivery timeliness; repeat use by members; payment reconciliation; customer complaints; and changes in sales volume by channel. Measurement should include a baseline and clearly defined observation period. Only when these operational outcomes are available would stronger claims about marketing performance and access to fresh food be warranted.

Theoretical and Community Development Implications

The study refines the use of TAM in community outreach evaluation. Perceptions of ease and usefulness help interpret why an introduction to digital tools may be relevant, but they should not be substituted for direct measures of sustained behaviour. By distinguishing awareness, guided operation and real commercial adoption, the proposed framework provides a clearer interpretation of what short community programmes can legitimately report. It also shows how acceptance-related theory can be linked to operational capabilities without implying a statistical test or causal mechanism that was not performed.

For community development practice, the intervention points toward a potentially valuable transition from market dependence toward diversified channels, yet the benefits remain conditional on local skills and fulfilment capacity. This perspective is relevant to agricultural producer groups with limited resources: inclusion requires accessible training, workable devices and connectivity, practical sales operations, and continued mentoring. During shocks such as COVID-19, operational flexibility may support resilience (Hobbs, 2020, 2021); however, this case alone does not demonstrate resilience gains or food-security improvements.

CONCLUSION

The Rezeki Bersama Farmer Group case illustrates the value and the limitations of introducing e-commerce to community-based agricultural marketing during COVID-19. The original programme records describe reliance on traditional markets and roadside selling, basic internet and marketing training, and a demonstrable website interface

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containing a product catalogue and shopping cart. These materials support the conclusion that farmers were exposed to digital information and online marketing functions and that a web-based interface was presented as an alternative to exclusively physical product display.

The evidence does not establish whether the website became an independently maintained, publicly operating sales channel. Nor does it establish routine stock control, successful orders, payment settlement, delivery performance, independent use after the programme, increased sales or improved community food access. TAM is therefore treated as an interpretive framework—not a statistically tested model—and learning is distinguished from operational use and durable adoption. The study's contribution is this evidence-sensitive differentiation, which connects technology familiarisation to the operational requirements of agricultural market participation.

For practitioners, recommended next steps are to assess members' devices, connectivity and skills; assign responsibilities for website and inventory management; establish a price and order-confirmation process; select safe payment and fresh-produce delivery options; and provide periodic technical mentoring. A small documented pilot should precede claims of commercial success. Limitations include an unspecified participant count and activity date, the absence of standardised competency and TAM measures, and unavailable transaction, financial, customer, delivery and longitudinal data. Future evaluations should use baseline and follow-up assessments, independently observed order records and participant interviews to test the sustainability of the system and whether it measurably affects market access, sales or food distribution.

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