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Evaluation of gourami farmers' welfare in the IZI Yogyakarta Smartfarm Program using the CIBEST Method

Liebe Sobandi & Rakhmawati

Program Studi Ekonomi Islam (S1), Universitas Islam Indonesia, Yogyakarta, Indonesia

ABSTRAK

Introduction

The integration of productive zakat programs with sector-specific interventions has emerged as a promising strategy for poverty alleviation and community empowerment. In Indonesia, the aquaculture sector, particularly gourami farming, holds significant potential for improving rural livelihoods. However, challenges such as low productivity, economic dependency, and limited market access hinder its growth. Addressing these issues requires innovative programs that align technical, financial, and spiritual support.

Objectives

This research aims to evaluate the welfare of gourami fish farmers who have received business capital assistance, technical training, and support based on productive zakat. The research was conducted on gourami farmers in Bantul Regency, Yogyakarta Province, who are beneficiaries of the Smartfarm program. The program is managed by the IZI Institution (Indonesian Zakat Initiative) with the support of the XL Axiata Ta'lim Assembly.

Method

This research is a population study, meaning it examines all recipients of the Smartfarm program. The respondents have been participants in the program since November 2022, but only five beneficiaries were successfully studied. Data analysis was conducted using the CIBEST method, which includes the calculation of Material Value (MV) and Spiritual Value (SV) scores. Beneficiaries are classified into four welfare categories based on these scores, namely materially and spiritually prosperous, materially prosperous only, spiritually prosperous only, and not prosperous. The comparison of MV and SV scores before and after the program was conducted to determine changes in welfare.

Results

The results show that the material value and spiritual value of each mustahik increased after participating in the zakat program. However,

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Contact: Rakhmawati ✉ rakhmawati@uii.ac.id

the category of mustahik based on the CIBEST quadrant did not change.

Implications

By evaluating the welfare changes in recipients of the Smartfarm program, the study highlights the potential benefits of zakat as a tool for poverty alleviation, particularly within the context of fisheries.

Originality/Novelty

This research contributes to the literature on productive zakat by applying the CIBEST framework in the aquaculture sector, offering a replicable model for addressing multi-dimensional welfare challenges.

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INTRODUCTION

Despite modest improvements in reducing poverty rates, a large segment of the population continues to struggle below the poverty line. Government initiatives and non-governmental programs have emerged to address material deprivation, yet challenges persist in ensuring that these efforts also strengthen the broader socioeconomic fabric of local communities (Dartanto & Nurkholis, 2013; Hanandita & Tampubolon, 2016; Hatta & Sarkawi, 2011; Priebe, 2017; Sugiharti et al., 2022; Sumner & Edward, 2014). Within this context, productive zakat has become increasingly significant as an Islamic philanthropic tool that not only addresses immediate financial needs but also provides structured support for sustainable livelihood development (Herianingrum et al., 2023; Jouti, 2019; Majid et al., 2024; Razak, 2019; Saputra et al., 2024; Sarif et al., 2024). This dual nature of zakat—combining material and spiritual aspects—positions it as a strategic intervention to help reduce poverty on multiple fronts. Moreover, several studies highlight how zakat can operate effectively when combined with capacity-building programs, equipping recipients with the skills, resources, and moral impetus necessary to achieve more stable economic conditions and further their personal and spiritual development (Al-Bawwab, 2023; Anwar, 2018; Fasiha, 2017; Mustari et al., 2024; Samsi et al., 2024).

Amid continued efforts to promote equitable growth, the per capita income in certain regions of Indonesia, such as the Daerah Istimewa Yogyakarta (DIY), remains under considerable strain (Fahmi & Maria, 2023; Khairunnida & Utomo, 2024; Laila et al., 2022). The proportion of the poor in DIY also exceeds national averages (Feriyanto, 2019; Nugraha et al., 2022), thereby magnifying the urgency for targeted interventions.

Additionally, local fish consumption remains relatively low compared to other areas (Pratisti, 2017; Virgantari et al., 2022), reflecting both a nutritional challenge and an economic opportunity. In particular, the underutilized potential of aquaculture in DIY has restricted regional self-sufficiency in fish supply, prompting reliance on external sources (Purnomo, 2018; Sahubawa et al., 2015; Sukardi, 2001). As a result, fish

prices can fluctuate substantially, and local smallholder farmers struggle to maximize profits, which hampers their capacity to reinvest and expand production. The practical significance of this issue is clear: a low-performing aquaculture sector not only curtails individual incomes but also undermines broader developmental goals associated with food security, rural employment, and sustainable economic empowerment. Consequently, enhancing fish farming productivity emerges as a vital strategy to improve living standards and bolster resilience in underprivileged communities.

Against this backdrop, the focus on developing gourami farming has gained traction in regions such as Tirtomulyo Village, where local conditions are conducive to fish aquaculture. Gourami, known for its relatively high market value and adaptability to local water conditions, offers promising prospects for improving farmers' incomes (Aurilia et al., 2023; Rahmah et al., 2024; Sutiani et al., 2020). Nonetheless, systemic limitations—including inadequate capital, limited technical know-how, and lack of stable market linkages—have left many potential gourami farmers dependent on less profitable activities. Although fish demand in DIY remains sizable, meeting that demand consistently requires consolidating production methods, adopting appropriate feeding regimens, and modernizing distribution channels. The overarching research problem thus centers on identifying how best to leverage available resources so that gourami farmers, specifically those categorized as mustahik (zakat recipients), might enhance their economic standing and reduce vulnerability.

Several programs have aimed to tackle this core issue through a blend of financing and training, but the unique contribution of zakat-based models, such as those championed by Inisiatif Zakat Indonesia (IZI), has begun drawing attention in both academic circles and policy discussions (Rahmat & Nurzaman, 2019; Saleh et al., 2019). Unlike conventional microcredit initiatives that rely on interest-based repayment structures, productive zakat programs mobilize religious funds to supply mustahik with capital (Nuryani et al., 2023; Toni, 2020; Zulkarnain & Farkhani, 2021). This approach includes structured mentorship in farming techniques, strategic planning, and community building. While global microfinance literature has explored how access to capital improves household income (Akotey & Adjasi, 2016; Alimukhamedova et al., 2017; Ghalib et al., 2015; Parvin et al., 2020; Postelnicu & Hermes, 2018), the added spiritual dimension in Islamic philanthropy presents a novel aspect with potentially broader ramifications for community welfare. The dual emphasis on spiritual and material prosperity, recognized in Q.S. At-Taubah: 60 (Febriant & Abdurrosyid, 2024; N. Hasan et al., 2024; Hasanah et al., 2024), aligns well with the notion of integrated community development. Therefore, interventions that merge religious principles with practical training have the potential to produce deeper and more sustainable transformations.

Building on general concepts of poverty reduction, prior investigations have indicated that synergy between capital provision and ongoing training tends to yield more robust results than a singular approach (Anandhi & Muhtadi, 2023; Fathin, 2023;

Idrus & Maman, 2021; Utami, 2018). Specifically, in the realm of aquaculture, mentors can advise farmers on best practices in pond maintenance, harvesting, fish disease control, and marketing. By addressing these technical gaps, households can move from subsistence-level aquaculture to more viable small-scale agribusiness. Furthermore, programs that incorporate spiritual reinforcement, such as regular religious discussions or communal prayer groups, appear to build confidence and solidarity among participants, enhancing mutual support. When mustahik acquire a stronger sense of moral responsibility, they actively strive to elevate their production methods and eventually transition into independent muzakki (zakat givers) (Muda et al., 2024; Ningrum & Misri, 2022; Riza, 2021).

Specifically addressing productivity constraints and spiritual development, some scholars have turned to the CIBEST (Center for Islamic Business and Economic Studies) model as an analytical tool for assessing welfare in a more holistic way. The model identifies four quadrants of household well-being, considering both material and spiritual dimensions (Beik & Arsyianti, 2016; Beik & Pratama, 2016; Mawardi et al., 2022; Rahmat & Nurzaman, 2019; Saleh et al., 2019). Applying this lens can help isolate not merely the magnitude of economic progress but also shifts in religious observance. In the context of productive zakat, a family may experience improvements in monthly earnings that correspond with a renewed commitment to community values, almsgiving, and religious learning. Another line of research employing CIBEST highlights that some households can remain spiritually robust even under conditions of material insufficiency, or conversely, be materially affluent but weak in spiritual adherence. Hence, the CIBEST tool can generate a nuanced understanding of how externally driven empowerment initiatives, including aquaculture training and zakat-based capital, can concurrently elevate both spheres of life.

Within this increasingly recognized framework, the Smartfarm Program initiated by IZI in Yogyakarta fits squarely into the growing body of evidence supporting integrative solutions for local farmers (Tegar, 2022). Yet despite the nascent findings hinting at the program's effectiveness, it remains crucial to rigorously document its outcomes in a structured academic study. The synergy of providing mustahik with capital, aquaculture training, and spiritual reinforcement potentially exemplifies a "best practice" blueprint that can be replicated in similar socioeconomic contexts. Nonetheless, gaps in the literature persist. Most scholarly works on zakat distribution concentrate on micro-entrepreneurship (Billah, 2018; Syamsul et al., 2019; Zaini et al., 2024) or agricultural products (Baskoro et al., 2017; Sani, 2022), with only limited consideration of fish farming. Moreover, the manner in which spiritual improvement aligns with economic gains in a single initiative remains largely underexplored, creating a clear gap that warrants further inquiry.

Given these considerations, the present study aims to assess the welfare changes experienced by gourami farmers in Tirtomulyo Village under the Smartfarm Program using the CIBEST model. By tracking their material progress and their spiritual

indicators, this research seeks to provide evidence on whether and how the integrated approach of productive zakat fundamentally enhances both dimensions of life.

Furthermore, the scope of this investigation encompasses the immediate financial outcomes for mustahik farmers, their evolving patterns of religious commitment, and the role of community support. By capturing both quantitative metrics (income changes) and qualitative insights (personal testimonies on spiritual aspect), the study endeavors to capture a comprehensive view of transformation in Tirtomulyo Village. The analysis includes comparative assessments of households before and after program participation, aligning with the CIBEST quadrant methodology. In so doing, this research not only validates the efficacy of the Smartfarm Program but also explores its unique contributions to the broader discourse on sustainable poverty alleviation. The integrated approach underscores the potential synergy between philanthropic funds anchored in religious injunctions and real-time knowledge transfer, thereby demonstrating the capacity for zakat to serve as a tool that balances material progress with spiritual enrichment. Through meticulous data collection and evaluation, this study aspires to contribute original insights into how integrated interventions can move beyond short-term poverty relief, offering instead a structured path toward holistic development that ultimately positions local fish farmers on a sustained trajectory of prosperity and elevated social well-being.

LITERATURE REVIEW

Productive Zakat in an Islamic Economic Framework

Productive zakat is a pivotal element within the Islamic economic framework, focusing on socio-economic empowerment and poverty alleviation. As an institutionalized practice, zakat is designed not just for immediate relief but also for sustainable economic growth among mustahik (zakat recipients) through initiatives that promote entrepreneurship and skill development (Firmansyah et al., 2024; Suhartoyo & Fauzan, 2024). The management of zakat is essential for enhancing community welfare, emphasizing its role as an instrument for equal wealth distribution and improved economic conditions (Siregar et al., 2023; Suhartoyo & Fauzan, 2024). By investing zakat funds in income-generating activities, mustahik experience enhanced financial independence, transforming their status from recipients of aid to active contributors within the economy (Furqani et al., 2018; Widiastuti et al., 2021).

Moreover, effective zakat management utilizes strategies that involve the collaboration of various stakeholders, including government bodies and community organizations, to ensure transparent allocation of resources (Mubarok et al., 2021; Zunaidi et al., 2023). This collaborative approach facilitates the alignment of zakat funds with broader developmental goals, enhancing their impact on alleviating poverty and fostering inclusive economic growth (Muliadi, 2020; Zunaidi et al., 2023). Thus, productive zakat not only embodies a religious obligation but is also crucial for socio-economic development, offering a multifaceted solution to persistent issues of poverty within Islamic societies.

Poverty and Community Development in the Context of Zakah

Zakah is a vital component of Islamic economic principles, aiming to reduce poverty and empower communities through wealth redistribution. By targeting the poor and vulnerable, zakah serves not only as a mechanism for financial support but also promotes sustainable socio-economic development. When effectively managed, zakah can facilitate entrepreneurship among recipients (mustahiq), transforming them into active contributors to their communities rather than mere beneficiaries (Kamaruddin et al., 2024; Sulaiman et al., 2021).

Several studies highlight the importance of integrating zakah with broader development goals, such as the Sustainable Development Goals (SDGs), emphasizing its role in fostering economic inclusion and reducing income inequality (Hoque et al., 2023; Rusydiana & Khalifah, 2024). The practice of zakah is closely tied to the Maqasid al-Shari'ah, or the objectives of Islamic law, which seeks the welfare of society by addressing fundamental human needs (Zakaria & Mohamad, 2019). Investments in zakah programs that focus on capacity building and skill development can significantly enhance the livelihoods of mustahiqs, thus stimulating local economies (Rizal & Adibah, 2022).

Moreover, the effect of zakah extends beyond financial assistance; it encompasses educational initiatives and empowerment strategies that leverage community participation to ensure sustainable development. This integrated approach not only addresses immediate poverty but lays the groundwork for long-term community resilience (Aliyu, 2019; Kasri, 2016).

Conceptualizing Welfare in Material and Spiritual Dimensions in Islam

In the Islamic framework, welfare encompasses both material and spiritual dimensions that are interrelated and essential for holistic well-being. The conceptualization of welfare is often guided by the principles of Maqasid al-Shari'ah, which aims to safeguard and enhance five core goals: religion, life, intellect, lineage, and property (Husna & Soemitra, 2022; Wulandari et al., 2022). Material welfare focuses on meeting basic needs and enhancing quality of life through economic empowerment and resource distribution. For instance, zakat and waqf play crucial roles in facilitating financial support to disadvantaged communities, thereby alleviating poverty (Sutrisno & Mulyawisdawati, 2022; Wulandari et al., 2022).

On the other hand, spiritual welfare emphasizes the role of faith and moral values in achieving a meaningful life and closeness to Allah. This spiritual dimension is critical as it helps individuals cultivate resilience and a sense of purpose, which are essential for personal and communal growth (Hasbi et al., 2023; Isnaini et al., 2024). Effective Islamic economic policies aim to balance these dimensions, ensuring that while material prosperity is pursued, it does not compromise spiritual integrity and communal harmony (Siswanto, 2022; Sutrisno & Mulyawisdawati, 2022). Ultimately, the integration of material and spiritual aspects of welfare leads to comprehensive human development, which aligns with the Islamic view of prosperity as

encompassing both earthly success and spiritual fulfillment (Alotaibi & Abbas, 2023; Hasbi et al., 2023).

The Smartfarm Program as an Integrated Model

The Smartfarm Program initiated by Inisiatif Zakat Indonesia (IZI) combines the ethos of productive zakat with practical aquaculture training (Tegar, 2022). Designed to address the specific needs of fish farmers in underprivileged areas, the program integrates capital infusions, best-practice workshops, and ongoing mentorship. In Yogyakarta, where local fish production struggles to meet consumer demand, Smartfarm focuses on optimizing the gourami farming process—ranging from seed selection and pond maintenance to marketing and distribution. This targeted intervention reflects the principle of "learning by doing," acknowledging that participants benefit most when theoretical instruction is supplemented with hands-on implementation.

Although numerous empowerment programs exist within Indonesia, Smartfarm stands out for its explicit linkage between spiritual conviction and material improvement. Zakat funds serve as the investment engine, establishing an Islamic philanthropic framework that emphasizes the moral imperative of utilizing resources effectively. Moreover, mentors guide recipients through regular site visits and group sessions, ensuring that issues such as water quality, feed composition, or disease management are addressed promptly (Chairunnisa & Bahri, 2024; Sudiana, 2024). By blending religious motivation (e.g., the responsibility to optimize zakat) and technical proficiency, the program aspires to bolster household incomes while strengthening spiritual resolve.

Effectiveness of Corporate and Institutional Zakat

Corporate zakat or zakat funds channeled through reputable institutions play a pivotal role in bolstering social welfare programs (Kholis & Mugiyati, 2021). In many instances, corporations partner with amil zakat organizations to pool resources and distribute them efficiently. By leveraging institutional expertise, these entities can establish structured frameworks of supervision, capacity-building, and long-term planning. For example, some companies integrate corporate social responsibility (CSR) activities with zakat collection, ensuring that philanthropic initiatives have coherent objectives and continuous funding. This synergy often results in robust monitoring, enabling stakeholders to evaluate outcomes systematically.

Scholarly research underscores that institutional or corporate zakat, when directed strategically, can catalyze community-level changes (Ahmad & Haq, 2021; Harahap, 2021; Walidah, 2024), particularly among low-income groups engaged in agriculture, livestock, or fisheries. Such allocations provide not only financial lifelines but also knowledge transfer, management training, and supportive networks that collectively lift marginalized households from chronic poverty. Hence, the positive impact of corporate zakat extends beyond individual recipients, fostering a sense of collective responsibility and reinforcing the role of Islamic social finance in addressing development gaps.

The CIBEST Method for Welfare Analysis

Given the holistic nature of Islamic economic thought, researchers have developed specialized metrics—among them the CIBEST (Center for Islamic Business and Economic Studies) model—to assess material and spiritual welfare in tandem. This model segments households into four quadrants based on whether they meet certain thresholds in both dimensions (Arif, 2016; Sukmawati et al., 2023). Those who excel materially and spiritually fall in the welfare quadrant, while those lacking in both dimensions occupy the absolute poverty quadrant. Additionally, two intermediate quadrants capture situations where either material or spiritual aspects remain underdeveloped relative to the other.

Academic literature supports CIBEST's utility in evaluating a broad range of Islamic social finance initiatives, including zakat distribution, microfinance interventions, and waqf-based projects (Ashar & Ryandono, 2019). By spotlighting spiritual engagement, CIBEST complements income-based indices, offering a more nuanced reading of how faith-related programs might alter household-level religious practices. In many case studies, households that experience economic uplift through training and financing also display enhanced spiritual participation, echoing the integrative aims of Islamic philanthropy. Consequently, the CIBEST model provides a critical framework for analyzing the transformative potential of programs like Smartfarm, which combine capital distribution with ongoing religious and technical guidance (Beik & Arsyianti, 2016; Beik & Pratama, 2016; Rahmat & Nurzaman, 2019).

Synthesis and Research Gap

Multiple strands of scholarship highlight the merits of linking faith-based initiatives, community-driven development, and targeted training to alleviate poverty. Productive zakat, specifically, has gained attention as a resourceful vehicle for uplifting mustahik, given its capacity for providing interest-free capital and skill-building. Studies suggest that such arrangements may reduce dependency over time, enabling recipients to evolve into self-reliant micro-entrepreneurs or even become new zakat payers (Bahri & Oktaviani, 2018; Cholifah & Ridwan, 2023; Shobah & Rifai, 2020). Nonetheless, limited empirical work focuses on aquaculture settings, despite the clear potential for boosting local fish production where demand outstrips supply.

While recent inquiries have measured changes in household income or business performance, few have systematically investigated shifts in spiritual welfare alongside material improvements in the context of gourami farming. The extant literature thus reveals a gap related to the intersection of aquaculture, religiously motivated finance, and holistic welfare assessment. By analyzing how the Smartfarm Program's integrated design fosters economic stability and strengthens religious commitment, this study seeks to fill that space, extending the body of knowledge about how faith-inspired strategies can contribute to local development initiatives in Indonesia.

METHOD

Research Design

The study employed a mixed-methods design to capture not only numerical data on income and production but also qualitative insights into farming practices and spiritual engagement. Integrating these perspectives allows the researcher to cross-check findings and form a comprehensive view. The quantitative component focused on measuring economic outcomes and spiritual indices before and after the intervention, while the qualitative component involved interviews. By synthesizing these data sources, the study aimed to address complexities in the lives of local gourami farmers, identifying any shifts that might be attributed to the Smartfarm Program.

Location and Duration of the Study

The research took place in Tirtomulyo Village, Bantul Regency, within the Daerah Istimewa Yogyakarta (DIY) province. Tirtomulyo was selected due to its established yet underutilized potential for freshwater aquaculture, particularly gourami farming. Many households in the area rely on small-scale fish ponds, making them suitable recipients for integrated support interventions. Additionally, local agencies and Inisiatif Zakat Indonesia (IZI) identified Tirtomulyo as a strategic location for expanding self-sufficient fish production.

Data collection spanned approximately four months. Data collection was conducted at a single point in time, after the intervention. Participants were asked to recall their conditions before and after the intervention. While this approach allows for a comparison of pre- and post-intervention measures, it may introduce recall bias as participants had to remember their pre-intervention state. By carefully designing the questions, the study minimizes potential biases and ensures a reasonable level of reliability in capturing changes experienced by participants.

Target Population and Sampling Strategy

The study targeted gourami farmers in Tirtomulyo Village who met three criteria: (1) recognized as mustahik (eligible zakat recipients) according to local religious authorities, (2) actively engaged in fish farming for livelihood or supplemental income, and (3) willing to attend the Smartfarm training and mentorship sessions. Initial listings were collected from the local IZI office, which maintained records of households receiving assistance.

The study did not employ a sampling strategy, as all participants were intended to be analyzed. However, due to practical constraints, only data from five participants could be included in the analysis. While the program benefited a total of 10 individuals, this study specifically analyzes data from five selected participants. The selection was based on the availability of financial records and the participants' willingness to provide detailed income information. The sample size, though not large, allowed for a thorough investigation of individual experiences, aligning with the study's mixed-methods design.

Sources of Data and Collection Techniques

Primary data were derived from structured surveys and interviews.

1. Structured Surveys: Researchers administered questionnaires to gather demographic profiles, household income, and spiritual dimension based on the CIBEST framework. The survey was crafted to measure changes in material and spiritual dimensions, following metrics by PUSKAS BAZNAS.
2. Semi-structured interviews explored more nuanced aspects of farmers' experiences, including challenges encountered, coping strategies, and personal motivations. Participants were encouraged to share how their religious values shaped their approach to fish farming or financial management. This qualitative layer helped interpret the numerical shifts captured by the surveys.

Researchers also visited each participant's pond. Unstructured conversations during these visits yielded insights into local social dynamics—such as neighborly cooperation in maintaining ponds or shared tasks in disease prevention.

Variables and Instrumentation

The study used both material and spiritual indicators to operationalize the notion of welfare, according to CIBEST framework.

1. Material Variable (MV): This dimension encompassed monthly household income, fish production yields, net profit margins, and access to basic necessities. Researchers used a structured questionnaire to collect quantitative data.

   To calculate the material value, this study uses poverty line of Yogyakarta City in 2024, which is then converted into the household per capita poverty line per month. As of March 2024, the household poverty line in Yogyakarta was Rp2,710,967 per household per month. Meanwhile, the material poverty line in Yogyakarta for the same period was Rp. 602,437 per capita per month. Material value is the ratio between the income and the MV threshold:

   $$MV\ threshold\ =\ 602{,}437\ \times\ 2.4\ =\ 1{,}445{,}848$$

   The average household size (2.4) is determined by dividing the total number of beneficiaries by the number of household heads. If the ratio between the income and the MV threshold is greater than one, it indicates that the individual is not materially poor.
2. Spiritual Variable (SV): The spiritual dimension was measured through the variable of regular prayer, fasting, paying zakat, worship in the family, and the support of policy to worship. The measurement scale is Likert Scale 1 to 5. The score is 5 if the participant regularly performs congregational prayers and engages in voluntary prayers; observes both obligatory and voluntary fasting; pays zakat fitrah, zakat on wealth, and gives charity/donations; creates a family environment that supports worship; and if the government policy fosters

a conducive environment for worship. The spiritual Value of a participant is the average score of those five aspects. If SV is greater than 3, the participant is not considered spiritually poor.

Data Analysis Procedure

Data analysis proceeded in several steps. First, all survey responses were coded, checked for completeness, and entered into statistical software. Subsequently, results were mapped onto the CIBEST (Center for Islamic Business and Economic Studies) model, a framework that classifies households into four quadrants based on a threshold for material and spiritual well-being. This final step provided a holistic view of welfare: Quadrant I denoted adequate material and spiritual fulfillment, while Quadrant IV signaled absolute poverty across both dimensions.

Ethical and Quality Considerations

Researchers adhered to ethical guidelines by obtaining informed consent from all participants. They clarified the study's objectives, data usage, and the voluntary nature of participation. Sensitive topics, such as household financial conditions or personal religious practices, were addressed respectfully, ensuring confidentiality. To heighten reliability, the researchers employed triangulation—comparing survey data, interview findings, and observational records to confirm or refine interpretations. Any discrepancies that arose were investigated further through follow-up conversations with respondents. By merging multiple evidence lines, the study reduced the risk of measurement bias and strengthened the credibility of its conclusions.

RESULTS

Income of the Mustahik

The Smartfarm Program, managed by IZI and supported by Majelis Taklim XL Axiata, aims to empower gourami fish farmers through productive zakat. In Tirtomulyo Village, which has favorable water resources for aquaculture, the program offers capital investment, technical training, and continuous mentorship. Prior to the intervention, local fish farming remained underdeveloped, partly due to low production capacity and limited market access. Consequently, local farmers relied heavily on external fish supplies, facing price instability and reduced profit margins.

The structured approach—combining capital support, technical expertise, and ongoing mentorship—is expected to improve productivity and sustainable income growth. While this study examined only five participants, the findings suggest broader potential benefits for all program recipients.

Before joining the *Smartfarm IZI* initiative, the farmers' income was highly unstable, with significant variations based on seasonality and external market factors. The participants primarily relied on traditional fish farming methods, which resulted in inconsistent yields and low productivity. Average monthly earnings for the selected farmers ranged from IDR 800,000 to IDR 1,500,000, which was insufficient to meet basic

living expenses. Consequently, most participants were categorized under *materially poor* conditions according to the CIBEST framework.

Following program implementation, participants reported an income increase of approximately 30%–50%. Monthly earnings post-program ranged between IDR 1,500,000 and IDR 3,000,000, depending on production cycles and market demand. The introduction of structured technical training, financial support, and mentorship enabled them to optimize fish farming practices, resulting in higher yields and more stable incomes.

CIBEST Quadrant

The CIBEST (Center for Islamic Business and Economic Studies) model is a comprehensive approach for assessing welfare levels, particularly in programs involving zakat-based economic empowerment. This analytical framework examines two key dimensions: material and spiritual well-being. The CIBEST model classifies welfare into four quadrants based on income levels and spiritual well-being:

1. Quadrant I (Welfare Category) – Beneficiaries have achieved both material and spiritual well-being. It is when the Material Value (MV) > 1 and Spiritual Value (SV) > 3.
2. Quadrant II (Materially Poor Category) – Beneficiaries maintain spiritual fulfillment but lack material sufficiency. It is when the MV < 1 but SV > 3.
3. Quadrant III (Spiritually Poor Category) – Beneficiaries are financially stable but experience a decline in spiritual well-being. It is when the mustahik has MV > 1 but SV < 3.
4. Quadrant IV (Absolute Poverty Category) – Beneficiaries lack both material and spiritual well-being. It is when the MV < 1 and SV < 3.

The MV and SV values for each analyzed participant are presented in Table 1. Table 1 presents the distribution of five individuals based on their Material Value (MV), Spiritual Value (SV), and their position within the CIBEST welfare quadrants. Interestingly, the distribution of individuals across the four quadrants remains the same before and after the program. This indicates that while some changes may have occurred at the individual level, the overall categorization of participants within the welfare framework did not shift. Nevertheless, the average income of beneficiaries increased by 35%. More stable access to resources and markets contributed to reduced financial vulnerability. Farmers who actively applied business strategies learned from the training sessions achieved higher profit margins.

Before the program, the average SV value was 3.52, with individuals A and B having the lowest SV scores at 3.4. The average MV value before the program was 0.82, with individuals D and E falling below the average at 0.21 and 0.17, respectively. This indicates that most individuals had yet to achieve optimal material well-being. After the program, there was a significant increase in the average SV value to 4.4, reflecting an improvement in spiritual well-being for all individuals. Individual A, for example, experienced the largest SV increase, rising from 3.4 to 4.8. The average MV

value also increased to 0.92, with individuals D and E showing slight improvements but still remaining below the average.

Tabel 1

The Material Value and Spiritual Value

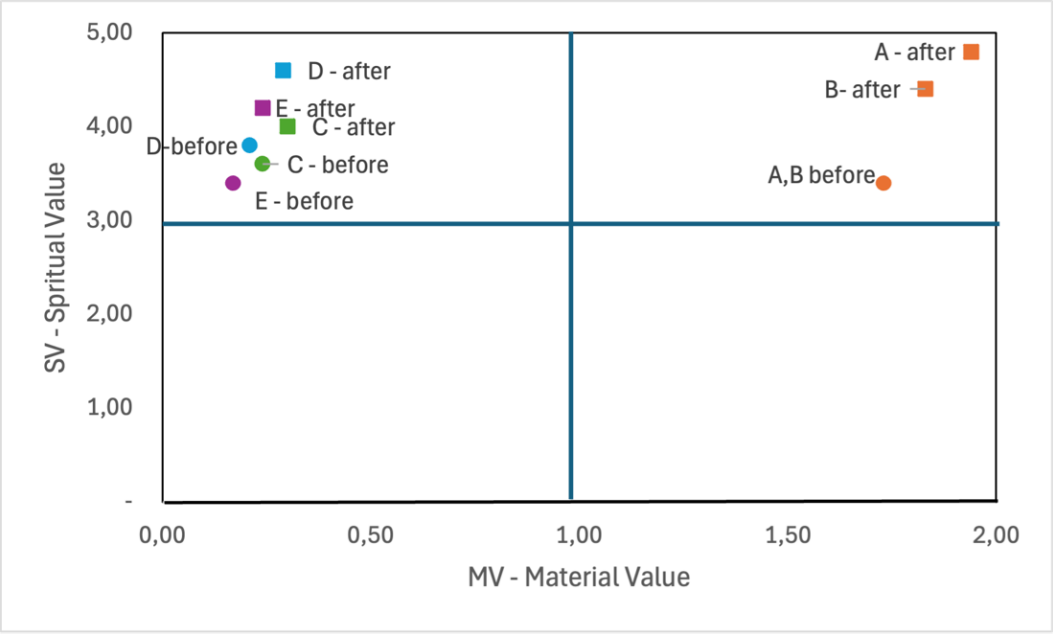
Beneficiary	Before			After		
	SV	MV	Quadrant	SV	MV	Quadrant
A	3.4	1.73	I	4.8	1.94	I
B	3.4	1.73	I	4.4	1.83	I
C	3.6	0.24	II	4	0.3	II
D	3.8	0.21	II	4.6	0.29	II
E	3.4	0.17	II	4.2	0.24	II
Mean	3.52	0.82		4.40	0.92	

Source: Primary data. Authors' estimation.

The increase in the mean value of MV from 0.82 to 0.92 indicates a slight improvement in the material conditions of zakat recipients. The rise in SV from 3.52 to 4.4 reflects that the zakat program also enhances spiritual well-being. To further illustrate the participant well being, CIBEST quadrant shifts were plotted based on pre- and post-program data, as plotted in Figure 1.

Figure 1

CIBEST Quadrant



Source: Primary data. Authors' estimation.

Individuals A and B fall into Quadrant I (Welfare), as their MV is above 1 and their SV is above 3. This indicates that they are neither materially nor spiritually poor, placing them in a prosperous condition. Their well-being is balanced across both dimensions, reflecting overall economic and spiritual stability.

Meanwhile, Individuals C, D, and E are positioned in Quadrant II (Material Poverty), with MV values below 1 but SV values above 3. This suggests that while they experience material poverty, they have attained spiritual well-being. Their strong spiritual foundation may contribute to resilience and life satisfaction despite economic limitations. This condition highlights the significance of non-material aspects in assessing overall welfare. Although none of individuals C, D, and E moved to the better Quadrant, all individuals experienced an increase in both Material Value and Spiritual Value. This indicates overall improvement in their well-being. However, the changes were not sufficient to shift them to a better quadrant.

No individuals are found in Quadrant III (Spiritual Poverty) or Quadrant IV (Absolute Poverty). Quadrant III represents those with sufficient material wealth but lacking spiritual fulfillment, while Quadrant IV includes those who are deprived in both aspects. The absence of individuals in these categories suggests that all participants have at least maintained a strong spiritual foundation, even if some still face financial hardships.

The Program's Role on Beneficiaries

Through a combination of financial support, skill development, and ethical guidance, the program has contributed to improved livelihood sustainability for beneficiaries. This section evaluates the program's influence on participants by analyzing economic growth, spiritual well-being, and long-term resilience.

Economic Aspect

One of the primary goals of the Smartfarm Program was to enable *mustahik* to achieve financial independence. The intervention led to notable improvements in income generation, business stability, and financial management.

Key indicators of economic progress include:

- Increased Average Monthly Income – Many beneficiaries reported a 35% rise in earnings, attributed to enhanced fish farming techniques and expanded market access.
- Greater Financial Stability – Participants were able to accumulate savings, reinvest in their businesses, and reduce dependency on external aid.
- Reduction in Income Volatility – The provision of business mentorship and capital investment helped farmers stabilize production costs, mitigating the risks of market fluctuations.

Social and Community Aspect

Beyond financial empowerment, the Smartfarm Program also strengthened social cohesion and community engagement among beneficiaries. This role was evident in the following areas:

- Enhanced Knowledge Sharing – Participants actively engaged in peer-to-peer learning, where experienced farmers mentored newcomers, fostering a culture of mutual support.

- Community-Based Economic Growth – The program encouraged collective marketing strategies, enabling farmers to negotiate better prices and increase their bargaining power.
- Strengthened Family Welfare – Improved economic conditions led to greater investment in children's education, healthcare, and household stability, enhancing overall quality of life.

These social improvements demonstrate that economic empowerment extends beyond individual financial gains, contributing to wider community development and social resilience.

Spiritual and Ethical Aspect

A distinctive feature of the Smartfarm Program was its emphasis on spiritual growth alongside economic development. This approach ensured that business success was aligned with Islamic values, promoting ethical entrepreneurship and faith-based economic practices.

Key spiritual transformations observed among beneficiaries include:

- Greater Religious Observance – Participants increased their engagement in communal worship and ethical business practices, reinforcing their faith-based responsibilities.
- Adoption of Islamic Business Ethics – Farmers integrated honest trade principles, fairness in pricing, and ethical financial management, strengthening their commitment to social responsibility.
- Heightened Sense of Gratitude and Purpose – Many beneficiaries expressed greater appreciation for their economic progress, viewing their success as a means to contribute back to society and support others in need.

Long-Term Sustainability and Program Continuity

It is found that none of the individuals moved to the better Quadrant, especially individual C, D, and E. However, all individuals experienced an increase in both Material Value and Spiritual Value. This indicates overall improvement in their well-being. However, the changes were not sufficient to shift them to a better quadrant. Furthermore, its long-term effect depends on continuous development and structured follow-up mechanisms. Key strategies to ensure sustainability include:

- Ongoing Business Mentorship – Continued guidance in financial literacy and business expansion will help farmers maintain growth and adaptability in changing market conditions.
- Strengthening Market Networks – Establishing direct supply chains and cooperative networks will ensure stable market demand and reduce reliance on intermediaries.
- Integration with Broader Zakat Programs – Expanding the Smartfarm model into other agricultural sectors will allow more *mustahik* to benefit from similar empowerment initiatives.

By implementing these long-term strategies, the Smartfarm Program can serve as a model for sustainable zakat-based economic development, fostering both financial security and ethical business leadership.

Factors Influencing the Program's Success

The effectiveness of the Smartfarm Program in improving the welfare of *mustahik* is shaped by multiple factors, both technical and non-technical. Understanding these determinants is crucial for assessing the sustainability and scalability of the program. This section systematically examines key factors that influenced its success, drawing insights from program implementation, beneficiary engagement, and external market conditions.

Technical Factors

1. Aquaculture Knowledge and Skill Development

One of the primary success factors of the program was the technical training provided to beneficiaries. Before participating in the Smartfarm Program, many fish farmers lacked adequate knowledge of modern aquaculture techniques, including:

- Optimal fish feeding strategies to maximize growth and reduce waste.
- Water quality management to maintain healthy fish populations.
- Disease prevention and treatment to minimize production losses.

The training sessions and hands-on mentorship improved beneficiaries' technical competencies, allowing them to implement efficient and sustainable fish farming practices. Participants who actively applied the recommended methods experienced higher fish survival rates and increased yields, which directly contributed to higher profitability.

2. Infrastructure and Farming Technology

The availability of essential farming infrastructure also played a crucial role in determining program outcomes. The Smartfarm Program provided beneficiaries with improved pond management systems, including:

- Efficient water circulation systems to maintain optimal conditions.
- Eco-friendly waste management practices to reduce environmental impact.
- Innovative feeding techniques that minimize costs and enhance fish health.

Farmers with better infrastructure adaptation achieved higher production efficiency compared to those who relied on traditional methods. This highlights the importance of technological integration in optimizing aquaculture productivity.

3. Access to Capital and Financial Resources

The provision of financial assistance through productive zakat significantly influenced business sustainability among beneficiaries. Prior to the program, limited access to credit was a major constraint, preventing farmers from:

- Expanding their production capacity due to financial limitations.

- Investing in high-quality feed and equipment, which affected output quality.
- Managing operational costs effectively, leading to profitability instability.

The Smartfarm Program's capital assistance alleviated these challenges, enabling farmers to reinvest in their businesses and enhance operational efficiency. Furthermore, financial literacy training equipped participants with skills in budgeting and expense management, ensuring long-term financial stability.

Non-Technical Factors

1. Market Access and Demand Stability

A critical determinant of economic success for fish farmers is their ability to access profitable markets. The Smartfarm Program played a key role in connecting farmers to buyers, reducing reliance on middlemen who often dictate lower prices.

Key market-related improvements included:

- Direct sales agreements with restaurants and wholesale distributors.
- Market expansion efforts to increase demand for locally farmed gourami.
- Price stabilization strategies to protect farmers from market fluctuations.

Farmers with stronger market connections secured higher and more stable revenues, reinforcing the economic viability of their businesses. However, those who struggled to establish consistent buyer relationships faced greater income variability, underscoring the need for long-term market integration strategies.

2. Commitment and Engagement of Beneficiaries

The level of commitment among beneficiaries varied, directly impacting program outcomes. Participants who actively engaged in training, mentorship, and financial planning demonstrated:

- Higher income growth, as they effectively applied program knowledge.
- Greater resilience, using strategic decision-making to overcome business challenges.
- Stronger community networks, leveraging peer support for business expansion.

Conversely, individuals who showed limited participation encountered slower progress, as they were less likely to adopt best practices and optimize farm productivity. This highlights the importance of ongoing motivation and beneficiary engagement in program sustainability.

3. Social and Cultural Influences

The presence of strong peer networks and shared religious values encouraged collaboration among beneficiaries, leading to:

- Knowledge-sharing initiatives, where experienced farmers mentored newcomers.
- Collective problem-solving, fostering a supportive business ecosystem.
- Enhanced spiritual motivation, reinforcing the ethical dimensions of Islamic economic practices.

Farmers who actively engaged with their communities and faith-based support systems reported greater program satisfaction and economic success. This underscores the role of social capital in enhancing sustainable economic empowerment.

External and Environmental Factors

1. Economic Conditions and Price Volatility

Despite the program's success in increasing fish yields, external economic factors, such as market price fluctuations, influenced profit margins. Factors that contributed to financial uncertainty included:

- Seasonal demand changes, affecting price stability.
- Competition with imported fish, impacting local sales.
- Rising operational costs, particularly for fish feed and pond maintenance.

While the Smartfarm Program helped reduce some financial risks, continued strategic planning and market adaptation are necessary to mitigate external economic challenges.

2. Environmental and Climatic Conditions

Unpredictable weather patterns and water quality issues also affected fish farming productivity. The Smartfarm Program emphasized adaptive strategies, such as:

- Water filtration technologies to maintain pond stability.
- Early disease detection measures to prevent stock losses.
- Climate-resilient farming techniques to withstand temperature fluctuations.

These interventions helped minimize environmental risks, ensuring consistent production outcomes among program participants.

DISCUSSION

Integration of Productive Zakat with Aquaculture

The findings of this study highlight the role of integrating productive zakat with aquaculture in improving the economic well-being of mustahik (beneficiaries). The results indicate that zakat-based funding, coupled with training and infrastructure support, enables small-scale fish farmers to enhance their productivity and financial independence. By investing in pond infrastructure, providing quality feed, and facilitating access to broader markets, the program helps farmers shift from subsistence-level fish farming to more commercially viable operations. This aligns with the principles of Islamic philanthropy, which emphasize sustainable economic empowerment rather than short-term financial assistance. Additionally, the moral and religious obligations associated with zakat contribute to higher commitment levels among recipients, fostering responsible fund utilization and long-term financial stability. These findings corroborate previous studies suggesting that microfinance and capacity-building programs, when integrated with religious motivations, can lead to more sustainable economic outcomes (Arifqi et al., 2024; Firmansyah et al., 2024).

Other studies have similarly emphasized the potential of productive zakat in supporting economic development and food security. Research on zakat-funded entrepreneurship programs has shown that such interventions significantly increase beneficiaries' income and foster self-reliance (Chotib et al., 2023; Sunarya & Rusydiana, 2022). Specifically, the application of zakat in aquaculture has been explored in different contexts, where it has been found to improve fish production, reduce dependency on imports, and stabilize local markets (Alfiani & Akbar, 2020; Wijaya & Ritonga, 2021). Moreover, previous studies indicate that digitalization in zakat distribution enhances efficiency, transparency, and fund utilization, allowing institutions to track progress and ensure that investments in aquaculture projects yield intended socio-economic benefits (Al-Taani et al., 2024; Rejab et al., 2023). The success of these initiatives highlights how strategic zakat management can transform traditional aid-based models into sustainable development frameworks.

Despite its potential, some studies have raised concerns about the sustainability of zakat-funded aquaculture projects, particularly regarding environmental and governance challenges. Research has pointed out that intensive fish farming, if not properly managed, can lead to ecological degradation, including water pollution and habitat loss (Li et al., 2022; Liu et al., 2021). Additionally, weak governance in zakat institutions may hinder the effectiveness of such programs, as issues related to fund misallocation and lack of proper monitoring mechanisms could undermine their long-term impact (Rejab et al., 2023; Tenriwaru et al., 2022). These findings underscore the need for a comprehensive approach that incorporates environmental sustainability, strong governance, and continuous monitoring to maximize the benefits of integrating zakat with aquaculture. Addressing these challenges will be crucial to ensuring that such initiatives not only enhance economic empowerment but also promote ecological resilience and sustainable resource management.

Significance of Material Improvements

The data reveal that post-intervention, most beneficiaries experienced increased financial aspect, enabling them to meet their essential needs and invest in income-generating activities. Specifically, access to capital facilitated better resource allocation, such as acquiring livestock, improving business infrastructure, and enhancing agricultural productivity. This aligns with the objectives of maqasid al-Shari'ah, which emphasize the necessity of fulfilling *daruriyat* (basic needs) and elevating living standards to *hajiyat* (comfortable life) (Zakaria & Mohamad, 2019). Additionally, recipients reported reduced financial stress, leading to improved psychological well-being and greater social participation. These findings reinforce the role of zakat as an effective poverty alleviation tool, not only in providing immediate relief but also in fostering sustainable financial independence (H. Hasan & Ali, 2019; Tarique et al., 2016).

Similar studies support these conclusions, demonstrating that productive zakat programs significantly contribute to economic empowerment and poverty reduction. Research has shown that zakat distribution enhances household consumption

patterns, facilitates access to education and healthcare, and fosters long-term entrepreneurial engagement (Aliyu, 2019; Sunarya & Rusydiana, 2022). Furthermore, empirical evidence indicates that productive zakat models—such as those funding micro-businesses, vocational training, and agricultural initiatives—enable recipients to transition from dependency to self-sufficiency (Chotib et al., 2023; Firmansyah et al., 2024). Digital transformation in zakat management has also proven beneficial, increasing efficiency, transparency, and fund allocation to ensure that recipients derive maximum benefit from financial aid (Al-Taani et al., 2024; Salleh et al., 2022). These findings suggest that strategic zakat distribution, when coupled with proper training and market access, has the potential to drive sustainable development and enhance social mobility.

Despite these positive outcomes, some studies highlight challenges associated with material improvements among zakat recipients, particularly concerning long-term sustainability and systemic barriers. Research suggests that while initial financial aid improves short-term living conditions, the absence of financial literacy training and business mentoring can lead to inefficient resource utilization, limiting long-term economic gains (Rejab et al., 2023; Tenriwaru et al., 2022). Additionally, in some contexts, zakat distribution may create dependency rather than fostering self-reliance if not accompanied by skills development and entrepreneurial training (Ashari et al., 2023). Moreover, structural barriers, such as inadequate market access, inflationary pressures, and limited government support, can impede the effectiveness of zakat programs in driving sustainable economic transformation (H. Hasan & Ali, 2019; Tarique et al., 2016). These findings emphasize the need for a comprehensive zakat management strategy that incorporates financial education, robust monitoring systems, and integration with broader economic policies to ensure lasting improvements in the living standards of zakat recipients.

Trajectories of Spiritual Enhancement

The findings of this study highlight the significant spiritual transformations experienced by zakat recipients beyond material improvements. Many beneficiaries reported an increased religious value, as evidenced by regular prayer, fasting, paying zakat, supporting worship in the family, and having Government that has conducive policy for worship. These developments suggest that economic stability, facilitated through zakat assistance, provides recipients with the time and emotional capacity to engage more deeply with their faith. Additionally, the moral framework surrounding zakat encouraged recipients to perceive the financial aid as an amana (trust), instilling a greater sense of ethical responsibility in utilizing the funds. Such spiritual growth fostered a more disciplined approach to economic management, as recipients displayed stronger adherence to ethical business practices and more proactive community involvement. These findings align with the broader understanding of zakat as a tool for both economic empowerment and spiritual purification, reinforcing the interconnected nature of financial well-being and faith-based fulfillment (Kamaruddin et al., 2024; Rahman et al., 2022).

Previous research corroborates these results, indicating that financial assistance rooted in religious principles can significantly enhance spiritual engagement and community cohesion. Studies have shown that recipients of zakat often report increased gratitude, hope, and reliance on faith, which in turn strengthens their psychological resilience in facing economic hardships (Jaenudin & Hamdan, 2022; Rajan et al., 2024). Furthermore, empirical evidence suggests that integrating Islamic teachings into zakat programs encourages beneficiaries to engage in long-term religious commitments, such as consistently paying zakat once they achieve financial stability, thereby sustaining a cycle of spiritual and economic upliftment (Hassan et al., 2022; Jiffry et al., 2023). Socially, zakat distribution fosters deeper communal ties, as recipients are more likely to participate in religious study circles, charity initiatives, and cooperative economic projects within their local communities (Kamaruddin et al., 2024). These studies collectively emphasize that zakat not only addresses immediate material needs but also serves as a catalyst for long-term spiritual enrichment and social integration.

While the findings overwhelmingly support the role of zakat in enhancing spiritual engagement, some studies suggest that its impact varies depending on recipients' pre-existing levels of religious commitment and socio-economic conditions. For instance, research indicates that some zakat recipients prioritize material gains over spiritual obligations, viewing financial aid as an economic right rather than a religious endowment (Ashari et al., 2023; Rejab et al., 2023). In cases where financial literacy and religious education are not incorporated into zakat programs, recipients may lack the awareness or motivation to channel their economic stability into deeper spiritual practices. Additionally, structural challenges, such as insufficient religious guidance and lack of long-term economic planning, may limit the sustainability of spiritual transformations facilitated by zakat (Rahman et al., 2022). These findings underscore the importance of integrating spiritual education and mentorship into zakat programs, ensuring that recipients not only benefit materially but also develop a lasting connection between economic empowerment and faith-driven personal growth.

Role of Mentorship and Continuous Training

The findings of this study underscore the essential role of mentorship and continuous training in optimizing zakat empowerment programs. Participants who received structured mentorship and ongoing technical support exhibited significantly better financial and entrepreneurial outcomes compared to those who only received initial financial assistance. Regular coaching sessions provided a platform for beneficiaries to exchange knowledge, address emerging challenges, and develop adaptive business strategies. For instance, farmers participating in the program who encountered issues with aquaculture management were able to promptly access expert guidance on disease prevention, feed optimization, and market expansion. This continuous support enabled them to achieve higher productivity and reduced operational risks. By contrast, those who did not actively engage in mentorship

reported slower growth and higher vulnerability to market fluctuations. These findings align with the broader understanding that microfinance or financial aid alone is insufficient for sustainable economic empowerment; rather, ongoing skill-building and personalized advisory services are critical to long-term success (Firmansyah et al., 2024; Ngalesoni et al., 2024).

Existing research further validates the necessity of integrating mentorship and training within zakat-based economic initiatives. Studies have demonstrated that financial capital alone does not lead to sustainable entrepreneurship unless accompanied by business development training, financial literacy education, and technical guidance (Ashari et al., 2023; Ayyubi et al., 2024; Qomariyah & Hilyatin, 2023). Moreover, mentorship programs that incorporate psychological and emotional support help beneficiaries develop self-confidence and resilience in managing their enterprises (Ayyubi et al., 2024; Syahputra et al., 2023). Digital transformation has also played a crucial role in modern zakat training programs, where fintech solutions are increasingly used to enhance beneficiaries' financial management skills and market access (Alshehadeh et al., 2024). Additionally, mentorship-driven initiatives have shown success in fostering a collaborative business environment, enabling beneficiaries to form cooperatives and establish stronger networks for resource-sharing and joint investment (Agusti et al., 2024; Syamsuri & Mokan, 2021). These findings reinforce the idea that zakat empowerment is most effective when it moves beyond simple financial distribution to incorporate structured learning and professional mentorship.

While the consensus supports the role of mentorship and training, some research points to challenges and potential limitations in their implementation. One notable concern is the variation in mentorship effectiveness due to differences in program design, mentor qualifications, and participant engagement levels (Mokodenseho et al., 2024). In some cases, zakat programs have struggled with maintaining consistent training quality, particularly when resources for long-term mentorship are limited (Tenriwaru et al., 2022). Additionally, some studies suggest that over-reliance on external mentors, rather than fostering peer-led mentorship, can create dependency rather than self-sufficiency among beneficiaries. These challenges highlight the need for a structured and adaptable mentorship framework that not only imparts technical and financial skills but also fosters independent decision-making and problem-solving capabilities. To maximize impact, zakat institutions should prioritize mentor selection, continuously refine training curricula based on evolving market demands, and promote peer-to-peer mentorship to build long-term sustainability within recipient communities.

CIBEST Quadrant Transitions and Welfare Interpretation

At baseline, households occupied Quadrant II (materially poor but spiritually rich) or Quadrant IV (lacking both resources and consistent religious participation). This distribution illustrated the harsh realities of low incomes in Tirtomulyo Village, where poverty impedes full engagement in religious and community life. However, after six

months of involvement in the Smartfarm Program, participants moved closer to Quadrant I (materially and spiritually well-off), indicating that improvements in daily income frequently coincided with stronger religious engagement. This finding aligns with broader research on productive zakat, which posits that Islamic philanthropy can substantially reduce the depth of poverty when combined with capacity-building.

Still, the distribution across the CIBEST quadrants also shows that spiritual enrichment is not automatically guaranteed just because incomes rise. Rather, the Smartfarm Program's success in nurturing religious engagement hinged on various mediating factors, including group discussions on Islamic teachings, the presence of a supportive local religious leader, and a well-coordinated mentorship structure. Households where these elements converged tended to manifest robust spiritual metrics, while those with weaker community ties faced more difficulty fully internalizing or sustaining spiritual transformations.

Persistent Structural and Social Challenges

Despite these positive developments, several systemic constraints remain. First, the pace of scaling up fish production within Tirtomulyo Village is influenced by uneven water availability and occasional quality issues. Farmers reliant on small-scale ponds are vulnerable to seasonal fluctuations in rainfall and temperature, which can lead to fish stress, disease outbreaks, or reduced feeding efficacy. While IZI's program tackled certain technical bottlenecks—like water filtration or feed composition—long-term stability might demand more sophisticated water management infrastructure at the community level. Second, even though the farmers have seen tangible benefits in terms of daily or monthly income, uncertain market structures continue to affect them, as they may lack the marketing alliances or logistical systems needed to negotiate stable contracts with retailers or supermarkets.

Additionally, cultural traditions and family responsibilities sometimes limit the extent of training uptake, especially for individuals who need to balance daily aquaculture duties with household tasks. Although the presence of local mentors alleviated some of these constraints by offering flexible training schedules, deeper transformation in gender roles or broader household participation remains an ongoing process. As reflected in the interviews, a few families delegated most aquaculture responsibilities to male heads of household, minimizing women's engagement, even though they might possess the capacity to manage certain aspects of fish feeding or bookkeeping. Future expansions of the Smartfarm Program may thus consider tailored workshops that involve female participants more actively, recognizing their potential to contribute significantly to farm productivity and decision-making processes.

Implications for Policy and Practice

The integrated findings in Tirtomulyo Village bear policy implications for governmental and non-governmental organizations looking to replicate the Smartfarm model. First, policymakers might consider encouraging synergy among local cooperatives, religious institutions, and aquaculture experts to sustain interventions beyond the pilot

stage. A more extensive collaboration could involve providing micro-insurance products to farmers, safeguarding them against risks such as disease outbreaks or environmental hazards. Such financial safety nets would allow participants to continue investing in pond improvement and operational expansions, maintaining the momentum of early success.

From a practice standpoint, establishing a robust local supply chain emerges as a cornerstone of sustained effect. If farmers can tap into local or regional markets more reliably, they reduce their vulnerability to exploitative middlemen and strengthen communal resilience. In tandem, program facilitators might integrate advanced marketing tools—perhaps via digital platforms—enabling direct sales or collective branding that fetches more favorable prices. Along similar lines, local religious leaders or community organizers could be trained to monitor participants' progress, ensuring that the spiritual dimension is nurtured alongside economic pursuits.

Lastly, this study also highlights the importance of continuous adaptation and localized strategies. Tirtomulyo's specific context, featuring fertile lands and a community accustomed to fish farming, may differ from other rural environments. Replicating the program in areas with distinct conditions—such as arid regions or regions lacking robust market demand—would require programmatic modifications. Careful diagnostic assessments at the outset can help shape the design of local training curriculums, operational guidelines, and financing frameworks that align with the region's climate, culture, and economic systems.

CONCLUSION

This study examined the Smartfarm Program's capacity to enhance both material and spiritual welfare among gourami farmers in Tirtomulyo Village, demonstrating the importance of integrating religious principles with targeted economic support. The findings reveal that recipients of zakat-based capital and aquaculture training generally experienced meaningful increases in household income, driven by upgraded pond management, improved fish health, and more effective marketing. Concurrently, participants reported greater commitment to spiritual practices.

By employing the CIBEST model, interestingly, the distribution of individuals across the four quadrants remains the same before and after the program. While some changes may have occurred at the individual level, the overall categorization of participants within the CIBEST framework did not shift. Before the program, the average SV value was 3.52. The average MV value before the program was 0.82. After the program, there was an increase in the average SV value to 4.4, reflecting an improvement in spiritual well-being for all individuals. Individual A, for example, experienced the largest SV increase, rising from 3.4 to 4.8. The average MV value also increased to 0.92.

The increase in the mean value of MV from 0.82 to 0.92 indicates a slight improvement in the material conditions of zakat recipients. The rise in SV from 3.52 to 4.4 reflects that the zakat program also enhances spiritual well-being. Overall, these results advance current understanding of how integrated approaches offer valuable

alternatives to conventional poverty alleviation strategies, positioning faith-driven models as vital complements to broader policy interventions in rural development contexts.

Limitations of the Study

While the results affirm the Smartfarm Program's role on participating households, several methodological and contextual constraints limit the study's generalizability. First, the sample size was relatively small, focusing on a select group of farmers in a single village. This narrow scope provided in-depth insights but may not capture the heterogeneity of other rural communities with differing socio-economic conditions or environmental challenges. Second, the before-after research design cannot measure impact. The absence of a control group outside the program further complicates attempts to isolate the program's specific effects.

Additionally, spiritual measures largely depended on self-reported indicators, introducing potential biases related to social desirability or personal perceptions. Variations in individual motivation and time availability also emerged, as some farmers attended trainings more diligently than others, thus complicating direct comparisons across participants. Moreover, the study concentrated on relatively short-term changes, leaving open the question of how farmers would maintain progress once direct support ended. Lastly, reliance on regional fish markets could shift if broader economic conditions changed substantially. These limitations suggest the need for cautious interpretation and highlight that further research with larger samples, mixed locations, and longitudinal tracking would strengthen the evidence base for program scalability.

Recommendations for Future Research

Further research should explore several avenues to reinforce and expand upon this study's conclusions. First, employing a larger, more diverse sample across multiple regions can illuminate how the Smartfarm framework performs under varying market conditions, climatic settings, and cultural dynamics. Comparative case studies in different provinces, especially those with limited water resources, might assess whether the same aquaculture model can adapt successfully elsewhere. Second, introducing a rigorous control or comparison group would bolster causal claims, helping identify specific program components—training, funding, or spiritual reinforcement—that yield the most significant outcomes.

Longitudinal studies extending beyond the initial months of program participation could also offer valuable insight into sustainability. Investigating whether improvements in income and spiritual engagement endure, strengthen, or diminish over time would refine understanding of long-term program efficacy. Additionally, employing mixed methods that incorporate objective measures of spiritual practices—alongside self-reported indicators—could reduce bias and deepen the interpretation of religious commitment.

Author Contributions

Conceptualization	L.S. & R.	Resources	L.S. & R.
Data curation	L.S. & R.	Software	L.S. & R.
Formal analysis	L.S. & R.	Supervision	L.S. & R.
Funding acquisition	L.S. & R.	Validation	L.S. & R.
Investigation	L.S. & R.	Visualization	L.S. & R.
Methodology	L.S. & R.	Writing – original draft	L.S. & R.
Project administration	L.S. & R.	Writing – review & editing	L.S. & R.

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Informed Consent Statement

Informed consent was obtained before the respondents filled out the questionnaire.

Data Availability Statement

The data presented in this study are available from the corresponding author upon reasonable request.

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Conflicts of Interest

The authors declare no conflicts of interest.

Declaration of Generative AI and AI-Assisted Technologies in the Writing Process

During the preparation of this work, the authors used ChatGPT, DeepL, Grammarly, and PaperPal in order to translate from Bahasa Indonesia into American English, and to improve clarity of the language and readability of the article. After using these tools, the authors reviewed and edited the content as needed and take full responsibility for the content of the published article.

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