

THE ROLE OF ZAKAT COMMUNITY DEVELOPMENT IN THE ADVANCEMENT OF SMART FARMING TO SUPPORT SUSTAINABLE DEVELOPMENT IN BONDOWOSO REGENCY

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Abstract

Islam, as a religion embodying *rahmatan lil 'alamin* (mercy to all creation), strongly emphasizes the preservation of human welfare, including faith, life, mental health, lineage, and property. This qualitative study, grounded in a post-positivist paradigm and phenomenology, explores the lived experiences of community members involved in smart farming empowerment in Bondowoso Regency. Focusing on the innovative "Subur Berkah" livestock village, data were collected through participant observation, semi-structured interviews with Baznas representatives and locals, and documentation. Snowball sampling identified informants with rich experiential knowledge. The researcher acted as the primary instrument, ensuring authentic engagement and data collection. Data analysis employed the interactive model of Miles, Huberman, and Saldana, involving condensation, display, and iterative conclusion drawing. Findings reveal that Baznas transforms zakat from charity into productive empowerment by identifying beneficiaries, delivering intensive training, and maintaining ongoing support, fostering economic and social independence. Smart farming innovations such as integrated housing, fermented feed, data-driven health management, and digital tools enhance livestock productivity and income. This participatory empowerment model significantly advances sustainable development goals by addressing poverty, food security, employment, inequality, and promoting environmentally sustainable, technology-driven rural development.

Keyword: Zakat Community Development, Smart Farming, Sustainable Development

INTRODUCTION

Islam, as a religion of *rahmatan lil 'alamin* (a mercy to all creation), highly emphasizes the preservation of human welfare. This welfare includes safeguarding faith, protecting life, preserving mental health, ensuring the continuity of lineage, and securing property and wealth (Ningrum, 2020:1). The primary objective of Islamic law (*sharia*) is to protect both personal and social aspects of human life. One of the social aspects is the obligation to pay zakat, which is mandated for individuals who meet the criteria of zakat eligibility (Widiasari & Sulistyawan, 2021:2). Zakat is a concrete manifestation of social justice, ensuring that those entitled to receive support do so equitably. During the Prophet Muhammad's era, zakat was effectively implemented according to sharia, with wealth collected from the wealthy (*aghniya'*) and distributed by the Prophet himself to the rightful recipients.

Historical accounts of Islamic governance highlight zakat's significant impact on the economy. For instance, during the rule of the Umayyad Caliph Umar ibn Abdul Aziz, society experienced exceptional economic prosperity. As reported by Sebaa & Zahra (2022:897) and Tanjung (2019:191), officials in charge of *baitul mal* (Islamic treasury) struggled to find poor individuals to assist due to the abundance of resources. Despite its past successes, zakat's current role in modern Muslim-majority countries remains limited, as reflected in persistent poverty and income inequality (Hakim & Syaputra, 2020).

Indonesia, being the country with the largest Muslim population, has yet to fully harness its zakat potential. According to data from the Indonesian Ministry of Religious Affairs, approximately 229.62 million Indonesians, or 87.2% of the total population of 269.6 million, identify as Muslim. However, as noted by Suryani & Fitriani (2022:44), Indonesia continues to face serious challenges of poverty and social inequality. These persistent issues suggest that the enormous potential of zakat remains underutilized. Rizal & Mukaromah (2021:38) further note that poverty is a long-standing problem in Indonesia's development, rooted in the failure to meet basic human needs such as housing, food, education, and healthcare. If not addressed, poverty may lead to broader social, economic, and political instability, thereby obstructing national development.

Economic development is hindered when poverty and inequality are rampant. Indonesia, as a developing nation, continues to struggle with high poverty levels. According to the Central Statistics Agency (BPS), as of March 2024, the poverty rate stood at 9.57%, or approximately 25.22 million people living below the poverty line (Badan Pusat Statistik, 2024). This inequality, despite the country's predominantly Muslim population, illustrates the gap between Islamic principles and current socio-economic realities.

To address poverty and inequality, economic policies must be tailored to the nation's socio-economic conditions (Fauzi, 2021:1530). One such policy is optimizing zakat collection and distribution. The potential zakat collection in Indonesia is estimated at IDR 327 trillion annually, yet only around IDR 21 trillion is realized (Andrios, 2023). This discrepancy underscores the need to improve zakat management to ensure its benefits reach those in need. Zakat, as a mechanism for income distribution, must be administered effectively to support economic empowerment programs.

According to Law No. 14 of 2014 Article 69, city and regency governments are obligated to manage and develop zakat assets sourced from both the government and individual *muzakki* (zakat payers). This legal framework empowers local governments to maximize zakat fundraising and distribution to support regional poverty alleviation initiatives. Zakat serves not only as an economic instrument influencing consumption,

production, and investment (Mutakin, 2023:42), but also as a tool for promoting national economic welfare, poverty alleviation, and community empowerment.

In this context, the government, through the National Zakat Agency (BAZNAS), introduced the Zakat Community Development (ZCD) program, aimed at integrating religious, educational, economic, health, and humanitarian development within targeted communities. The primary goal is to improve community welfare and enhance grassroots economic empowerment.

Bondowoso Regency in East Java is one of the areas benefiting from BAZNAS's community empowerment program. Located in the eastern part of Java, Bondowoso has a high poverty rate. According to the Bondowoso Regional Statistics Office, the poverty rate in 2024 stands at 12.60%. It ranks among the ten poorest regencies out of 38 in East Java, as shown below:

Table 1.1 – Ten Regencies with the Highest Poverty Rates in East Java

No.	Regency	Poverty Rate	Rank
1	Sampang	23.76%	1
2	Bangkalan	21.57%	2
3	Sumenep	20.51%	3
4	Probolinggo	18.91%	4
5	Tuban	16.31%	5
6	Ngawi	15.57%	6
7	Pamekasan	15.03%	7
8	Pacitan	15.16%	8
9	Bondowoso	14.73%	9
10	Lamongan	13.38%	10
Source: Central Statistics Agency			

According to BAZNAS Bondowoso, zakat fundraising potential in the region has nearly reached IDR 8 billion. If effectively optimized and directed toward productive uses, this potential could significantly reduce poverty. Bondowoso is also predominantly agrarian, located in a highland area where most residents work as farmers or livestock breeders. Livestock farming, in particular, plays a vital role in the local economy. As technology continues to transform the global economy, agriculture—especially agribusiness—has emerged as a critical industry (Sukanto & Dwi Atmanti, 2011:20).

Livestock farming is a promising agricultural subsector capable of generating substantial income and capital turnover (Pratama, 2021:2). Arifin (2021:193) asserts that livestock is inherently integrated with environmental conditions and functions as an

agribusiness unit. Therefore, BAZNAS, in collaboration with related institutions, has initiated a community-based empowerment program. One such initiative is the establishment of “Zakat Villages” in multiple locations throughout Bondowoso Regency to promote welfare and reduce poverty.

This research focuses on one such village, located in Sulek Village, Tlogosari District. Based on assessments and surveys, Sulek Village was deemed suitable for the ZCD program due to its unstable economic conditions and large number of underprivileged residents. Consequently, a *mustahik* (zakat recipient) group named “Subur Berkah” was established. They received 60 female sheep and 5 male sheep for breeding purposes under structured management.

The empowerment process involved direct mentorship from academic experts from the University of Jember (UNEJ) Bondowoso campus and technical supervision from the local Livestock Office. The program adopted a modern livestock management approach known as *smart farming*, which integrates advanced technology to improve livestock productivity and efficiency. This includes the use of sensors, data analytics, Internet of Things (IoT), animal health monitoring systems, and automation in feeding and housing. Through this technology, farmers can access real-time data on livestock health, productivity, and nutritional needs.

Smart farming has been recognized as a viable strategy to increase agricultural output and quality while reducing production costs. According to Rachmawati (2020), the integration of information and technology in agriculture has led to significant innovations. A study conducted in Germany revealed that 80% of farmers agreed that smart farming enhances productivity, and all respondents acknowledged its overall benefits (Knierim et al., 2019:90).

Since the implementation of the program, the livestock population has significantly increased from the initial 65 to more than 750 healthy sheep. This remarkable growth has garnered public interest, turning the village into a learning destination for sustainable livestock management. Moreover, livestock waste is now processed into ready-to-use fertilizer, further demonstrating the program's resource efficiency.

This model of zakat management aligns with the broader goals of sustainable development, known as the Sustainable Development Goals (SDGs). The SDGs resonate with the objectives of *maqashid sharia*, providing a framework to connect zakat practices with holistic development goals. Specifically, zakat programs that target poverty and hunger reduction align with the first two SDG pillars: “No Poverty” and “Zero Hunger.” Thus, zakat holds significant potential as a powerful instrument in achieving the SDGs in Indonesia.

RESEARCH METHOD

The research employs a qualitative approach grounded in the post-positivist paradigm, specifically phenomenology, to explore the lived experiences of individuals involved in community empowerment through smart farming initiatives in Bondowoso Regency. This phenomenological study seeks to uncover the symbolic meanings behind participants' actions by conducting in-depth observations and interviews, particularly at the "Subur Berkah" livestock village. The site was purposively selected for its innovative and structured empowerment programs aligned with the principles of sustainable development. Data collection techniques include participant observation, semi-structured interviews with stakeholders such as Baznas representatives and community members, and documentation of relevant records and activities. Snowball sampling is utilized to identify key informants with rich experiential knowledge. The researcher acts as the main instrument, engaging directly in field activities to capture authentic insights. Data analysis follows Miles, Huberman, and Saldana's interactive model, comprising data condensation, display, and conclusion drawing, allowing for iterative refinement of findings. This methodological framework aims to develop a replicable empowerment model that contributes to sustainable development goals in rural Indonesia..

RESULT AND DISCUSSION

Findings

A. The Model of Empowerment and Zakat Community Development Management in Bondowoso Regency

This study aims to comprehensively examine how the empowerment and management model of zakat is implemented by the National Zakat Agency (BAZNAS) of Bondowoso Regency within the context of community development. Based on in-depth interviews with zakat managers, village officials, and beneficiary *mustahik*, it was found that the implemented zakat empowerment model consists of three strategic stages:

1. Participatory Planning Stage: Synergy Between Institutions and the Community

Planning serves as a critical foundation in determining the direction and success of the zakat empowerment program. This stage is conducted in a participatory manner by involving various elements of the local community. The planning process is not top-down but rather based on the actual needs of the community, which are identified through social mapping and assessment processes. This approach aligns with Chambers' *Participatory Rural Appraisal* (PRA) theory, wherein communities are actively involved in problem identification and the formulation of locality-based solutions (Phahlevy et al., 2024: 296).

During this planning stage, BAZNAS Bondowoso, together with ZCD (Zakat Community Development) facilitators, conducts field surveys to identify local

economic potentials, particularly in the livestock sector, which is deemed suitable for the geographical and social conditions of the region. Additionally, assessments are conducted on the characteristics of *mustahik*, the feasibility of prospective beneficiaries, and the community's readiness to implement the program collectively.

Facilitators reported that this stage also includes the development of a structured work plan for the livestock groups, encompassing role distribution, mentoring mechanisms, short-term and long-term targets, and indicators of program success. This comprehensive planning serves as a principal guideline for all stakeholders to implement the program in a measurable and sustainable manner. Hence, the planning stage functions not only as a technical initial step but also as an early awareness process for the community to recognize themselves as the main subjects of economic transformation through productive zakat.

2. Capacity Building Stage: Strengthening the Competence and Self-Reliance of *Mustahik*

Capacity building is a central element in transforming *mustahik* from passive recipients into active agents of development. In this context, BAZNAS Bondowoso provides both technical and non-technical training to *mustahik*, including training on proper livestock maintenance, sheep health management, and business finance, such as bookkeeping and business planning. This is intended to enable *mustahik* not only to raise livestock properly but also to manage their businesses sustainably.

BAZNAS has also introduced Smart Farming approaches on a small scale. Technologies such as body temperature sensors for livestock, automated feeding systems, and body weight monitoring tools have been gradually introduced, adjusted to the conditions and capabilities of the rural *mustahik*. Although challenges remain, such as limited technological literacy and infrastructure access, direct mentoring strategies have been employed to ensure comprehension and practical use. This aligns with community empowerment concepts as noted by Kurniawan et al. (2023: 164), which emphasize the importance of capacity building and skill mastery for communities to gain control over their socio-economic conditions.

Moreover, the formation of small business groups creates opportunities for collective learning, experience sharing, and strengthening of social capital among *mustahik* (Putnam, 2000).

3. Evaluation and Development Stage: Continuous Monitoring and Program Replication

Following program implementation, BAZNAS conducts periodic monitoring and evaluation to assess program effectiveness, the progress of *mustahik*, and the readiness of groups to continue their businesses independently. Evaluations are conducted every three to four months and serve as the basis for improvements and potential expansion of the model to other villages. This approach is based on the principles of *Participatory Monitoring and Evaluation* (PM&E), wherein all stakeholders,

including beneficiaries, are involved in the evaluation process to enhance transparency, accountability, and program quality (Holland et al., 1992: 397–418).

Nevertheless, challenges persist at this stage, such as the limited number of facilitators and weak administrative systems within the groups. Despite this, the evaluation process is considered crucial for promoting program replication in other communities and establishing sustainable zakat empowerment standards.

In the development phase, BAZNAS also focuses on institutional strengthening of *mustahik* through the establishment of livestock cooperatives. These cooperatives are expected to serve as platforms for *mustahik* to manage businesses collectively, increase market bargaining power, and strengthen long-term economic self-reliance. This step is consistent with the principles of community development, which position the community as the central agents of development who hold control over their own endeavors (Göncüoğlu-Eser et al., 2004: 10).

Overall, the evaluation and development phase reflects a continuous effort to improve and refine the productive zakat empowerment program so that its impact extends beyond the short term and contributes to the long-term economic sustainability of *mustahik* communities.

Based on the three stages described above, the Zakat Community Development (ZCD) model implemented in Bondowoso Regency can be categorized as a transformative model that integrates zakat assistance with the process of community capacity building. This approach reflects a paradigm shift in zakat, from merely a charitable function to a strategic role in local economic development (Antonio et al., 2012). The model demonstrates several key characteristics:

1. Participatory: Communities are involved from the planning to the evaluation stages.
2. Productive: Zakat is used to support economic activities, not merely for consumption.
3. Contextual: The model is based on local economic potential.
4. Self-reliance-Oriented: Empowerment is achieved through training and business group formation.
5. Adaptive and Sustainable: Regular evaluations are conducted to facilitate continuous program development.

Thus, zakat is no longer viewed merely as an individual religious obligation but rather as an effective development instrument when managed systematically, measurably, and with an empowerment-based approach (Obaidullah & Shirazi, 2015).

B. Smart Farming Management in Empowering the Community Economy

This section discusses how smart farming, as implemented through the Kampung Ternak Domba (Sheep Village) program managed by BAZNAS in Bondowoso Regency,

contributes to empowering the local economy. The main focus includes planning, capacity building, impact evaluation, and sustainable development directions. The discussion is also linked to previous studies to provide academic depth and empirical relevance. Based on the research findings, smart farming management in empowering the community economy is carried out through the following steps:

1. Technology Integration in Mustahik Empowerment

The management of smart farming begins with the identification of local potential, which is then enhanced through simple technological interventions such as livestock shed temperature sensors, animal health monitoring systems, and automated feeding devices. BAZNAS functions as both a technology facilitator and a trainer for *mustahik* (zakat recipients) to enable them to use these technologies sustainably. This approach has shifted traditional working patterns to more measurable and efficient ones. Mustahik are trained to conduct digital financial recording, monitor livestock conditions using mobile applications, and manage production according to a schedule. However, these practices are not yet fully implemented.

2. Capacity Building and Implementation of Smart Farming Technology

The smart farming program in the context of sheep farming is realized through the capacity enhancement of farmers, such as training in livestock shed management, fermented feed production, automatic temperature measurement, and the use of sheep growth monitoring applications. Training is provided periodically by BAZNAS through trained field assistants. These findings are in line with the study by Komalasari et al. (2024:27), which states that the adoption of smart farming technology among smallholder farmers in West Nusa Tenggara (NTB) has led to improved feed efficiency and reduced livestock mortality by up to 30%. Direct training and mentoring are key to the success of this technology. BAZNAS Bondowoso has also established livestock groups as platforms for horizontal knowledge exchange among mustahik. This is consistent with findings by Baga & Puspitasari (2021), who emphasize the importance of social learning in economic empowerment through community-based models.

3. Economic and Social Impacts

The program has shown positive economic and social impacts, including increased farmer income, strengthened social capital, and enhanced technical capacity. Specifically, mustahik have experienced:

- A 20–40% increase in income from livestock and agricultural activities.
- A reduction of up to 30% in operational costs through improved feed efficiency.
- Expanded marketing networks through digital media.

As highlighted in Ummah's (2019: 288–296) research, productive zakat in the livestock sector has a medium-term impact on increasing mustahik household expenditures and children's access to education. This is reflected in the narratives of mustahik supported by BAZNAS Bondowoso, who have begun saving and enrolling their children in higher levels of education. Socially, the program has fostered solidarity among livestock groups and encouraged the regeneration of young farmers by involving local youth. BAZNAS also conducts regular program evaluations, covering both technical aspects and spiritual elements (such as routine *istighosah* prayers), thereby creating an integration between economic empowerment and religious values.

4. Evaluation and Implementation Challenges

Despite the positive outcomes, the implementation of smart farming still faces several challenges. Most mustahik are not yet familiar with digital devices and have limited access to internet connectivity. These challenges are consistent with findings by Ainun Apriliyani Muhyun, who stated that one of the main barriers to digital technology adoption in rural areas is the digital divide—in terms of devices, skills, and infrastructure (Ardiansyah, Mursyid et al., 2025: 40–42). Internal evaluations by BAZNAS indicate that the sustainability of the program heavily depends on an intensive mentoring model and phased training. Moving forward, the development of a blended learning model for mustahik training may serve as a viable solution to address limited access.

C. The Role of Zakat Community Development in Supporting Sustainable Development in Bondowoso Regency

This study finds that the Zakat Community Development (ZCD) model implemented by BAZNAS of Bondowoso Regency plays a strategic role in supporting sustainable development, encompassing economic, social, and environmental dimensions. The model is not merely charitable but emphasizes an empowerment approach based on local potential and active community participation. The discussion focuses on analyzing how the ZCD approach can serve as an effective instrument to support sustainable development, particularly in rural areas such as Bondowoso Regency. Based on the research findings, the role of ZCD in promoting sustainable development—as also identified by Ahmad (2006)—is elaborated as follows:

1. **Economic Dimension: Community Empowerment and Self-Reliance**
Field findings show that the ZCD program, through the *Kampung Ternak Domba* (Sheep Farming Village), significantly increased the income of *mustahik* (zakat recipients). The program provides access to livestock, technical training, and intensive assistance. The application of smart farming—including livestock weight monitoring, feed rotation systems, and efficient barn management—contributes to improved productivity. Most farmers reported income increases

- of 20–30% within a single fattening cycle. Sustainable production practices, such as the use of fermented feed and the utilization of livestock manure for organic fertilizer, also contribute to cost efficiency. This aligns with SDG goals 1 (No Poverty) and 8 (Decent Work and Economic Growth), positioning zakat as an alternative funding source to enhance the economic resilience of underprivileged communities.
2. **Social Dimension: Strengthening Mustahik Institutions and Social Cohesion**
In Bondowoso, the ZCD program has formed community-based livestock groups with organizational structures and role divisions. Interviews revealed that regular meetings, joint training sessions, and deliberative decision-making foster a sense of ownership, responsibility, and social solidarity. This model enhances farmers' bargaining power in accessing markets and resources. Support from BAZNAS and field facilitators has led to sustainable capacity building. Some *mustahik* have even been trained to become mentors for new groups, generating a multiplier effect. By reinforcing social capacity and local institutional structures, this program contributes to the achievement of SDG goals 11 (Sustainable Cities and Communities) and 16 (Inclusive and Effective Institutions) (Kretzmann & McKnight, 1993).
 3. **Environmental Dimension: Environmentally Friendly Livestock Practices**
Environmental management within the *Kampung Ternak Domba* program reflects long-term sustainability awareness. Examples include the use of livestock waste for composting, the development of alternative feed from local agricultural waste, and training on barn sanitation to reduce odor and pollution. These strategies not only reduce production costs but also minimize the ecological impact of livestock activities on surrounding environments. Farmers are also involved in the management of forage cultivation, helping maintain the ecological function of land. These efforts contribute to the achievement of SDG goals 12 (Responsible Consumption and Production) and 13 (Climate Action) (OECD, 2011).
 4. **Integration of Zakat with Sustainable Development Goals**
The ZCD approach in Bondowoso reflects an integration of Islamic values—particularly the principles of *maqasid al-shariah*—with the sustainable development paradigm. Zakat is not only viewed as a religious obligation but also as a transformative socio-economic instrument. Through this program, BAZNAS has demonstrated that structured, data-driven zakat management can address the root causes of poverty in a systemic way. Key elements supporting program sustainability include a livestock monitoring dashboard, group financial records, and business management training. Antonio, Sanrego, and Taufiq (2012:13–29) argue that the synergy between zakat and development is most effective when zakat management is institutional and participatory. In the

context of Bondowoso, the role of BAZNAS as facilitator, stakeholder connector, and market access provider strengthens an inclusive empowerment ecosystem.

CONCLUSION

This study, titled *"The Role of Zakat Community Development in the Advancement of Smart Farming to Support Sustainable Development in Bondowoso Regency,"* aims to examine the interconnection between community empowerment-based zakat management (Zakat Community Development or ZCD), the implementation of smart farming, and its contribution to sustainable development. The findings reveal that the ZCD model in Bondowoso Regency, implemented by BAZNAS, employs a participatory empowerment approach that goes beyond consumptive zakat distribution by promoting productive zakat through community capacity building, particularly in sheep farming. This model includes stages such as planning (identifying mustahik groups), intensive assistance (capacity building), skills training, and continuous monitoring and evaluation, successfully fostering economically and socially independent beneficiary communities. Smart farming is managed through the integration of modern technology and management practices in livestock, including integrated housing systems, fermented feed, data-based animal health management, and the use of digital applications. These innovations enhance production efficiency, reduce failure risks, and improve livestock quality, thereby increasing the income and entrepreneurial spirit of beneficiary groups. Furthermore, ZCD has demonstrated a strategic role in advancing the Sustainable Development Goals (SDGs), particularly in poverty alleviation, food security, decent employment, and reducing inequality. The smart farming-based ZCD approach fosters a sustainable, environmentally friendly, and technology-based empowerment system, transforming zakat from a mere philanthropic instrument into an inclusive and sustainable tool for socioeconomic development. Its ability to integrate social, economic, and environmental aspects aligns it closely with sustainable development principles, especially in reducing poverty, generating green jobs, and preserving local natural resources.

Based on these findings, several academic and practical recommendations are proposed: BAZNAS Bondowoso should expand the ZCD program by increasing the number of target villages and enhancing institutional capacity in managing productive zakat and smart farming technology. Collaboration with academia, livestock services, and the private sector must be strengthened to support innovation and program sustainability. Capacity building for zakat administrators (amil) in productive zakat management and smart farming technology is also essential. Local governments are encouraged to support smart farming-based ZCD programs through enabling policies, infrastructure, technology access, and technical training. Cross-sectoral program

synchronization should be improved to maximize zakat's impact on sustainable development. Beneficiary communities should continue enhancing their capacities in technology adoption, business management, and digital marketing while fostering independence and business sustainability through strengthening local economic institutions such as cooperatives or village-owned enterprises (BUMDes). Finally, future researchers are advised to further explore the long-term sustainability of ZCD programs and develop more measurable, data-driven evaluation indicators, as well as to conduct comparative studies across regions to identify best practices in managing productive zakat through smart farming..

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