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# Triple bottom line corporate social responsibility: Social, economic, and environmental impact analysis of community-based water management program

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Received Date: June 29, 2025

Revised Date: August 15, 2025

Accepted Date: August 29, 2025

## ABSTRACT

**Background:** Corporate Social Responsibility (CSR) environmental programs often face challenges in demonstrating measurable social, economic, and environmental impacts. The Irrigation Volunteer Forum (Forum Relawan Irigasi/FRI) in Klaten is a community-based water management initiative supported by CSR and multi-stakeholder collaboration. This study analyzes the triple bottom line impacts of the FRI program and its contribution to creating shared value for people, planet, and profit. **Methods:** This qualitative case study was conducted in Juwiring Sub-district, Klaten District, Central Java, from October to December 2024. Data were collected through in-depth interviews with 25 informants, participatory observation, and document analysis. Data were analyzed using the interactive model of Miles et al. (2014). **Findings:** The FRI program generated positive impacts across three dimensions. Socially, it reduced conflicts in water distribution, increased trust among farmers, strengthened social solidarity, and improved institutional capacity. Economically, it eliminated irrigation pumping costs, reduced idle agricultural land, increased land utilization, and improved farmers' income. Environmentally, the program restored blocked irrigation channels, rehabilitated previously unproductive land, improved water-flow efficiency, and supported ecosystem preservation. Key success factors included volunteerism, CSR support, multi-stakeholder collaboration, communication technology, local traditions of mutual cooperation, social solidarity, and inclusive gender participation. **Conclusion:** The FRI program demonstrates that community-based CSR initiatives can simultaneously generate social, economic, and environmental benefits through empowerment-oriented approaches. The findings show how partnerships between corporations and organized communities can create shared value using participatory water management practices. **Novelty/Originality of this article:** This study provides empirical evidence of the triple bottom line impacts of CSR-supported irrigation management and offers a replicable community-based model for sustainable value creation through people, planet, and profit dimensions.

**KEYWORDS:** community organizing; corporate social responsibility; irrigation management; shared value; triple bottom line.

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## 1. Introduction

Water resource management constitutes a critical challenge in achieving sustainable development goals, particularly in agricultural regions where irrigation systems determine food security and rural livelihoods. The complexity of water governance encompasses technical infrastructure, social relationships among farmer groups, and economic considerations of construction and maintenance costs (Sudarmadji et al., 2020). In

### Cite This Article:

Fiyana, B. S. (2025). Triple bottom line corporate social responsibility: Social, economic, and environmental impact analysis of community-based water management program. *Environmental, Social, Governance and Sustainable Business*, 2 (2), 125-139. <https://doi.org/10.61511/esgsb.v2i2.2025.2640>

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Indonesia, 80% of water resources are allocated for agricultural irrigation, yet 46% of irrigation systems are categorized as poorly maintained, affecting 7.4 million hectares of irrigated land (Ministry of Public Works and Housing, 2020). Water scarcity in major rice-producing river basins has become an escalating challenge, with 31% of rice fields producing 35% of Indonesia's rice output located in areas experiencing severe water scarcity (World Bank Group, 2021). Corporate Social Responsibility (CSR) has emerged as a strategic instrument for addressing environmental and social challenges through corporate engagement with local communities. However, conventional CSR approaches in Indonesia have been criticized for their top-down nature, lack of community participation, and limited measurable impacts (Jalal, 2022). Many CSR environmental programs function as charitable activities rather than sustainable empowerment initiatives, resulting in dependency rather than community self-reliance (Saputra & Wibawa, 2018). The theoretical framework of triple bottom line proposed by Elkington (1997) emphasizes that sustainable business practices must balance three dimensions: people (social equity), planet (environmental quality), and profit (economic viability). This framework challenges the traditional shareholder-centric view by arguing that corporations should create value for all stakeholders while maintaining ecological integrity.

Despite extensive literature on CSR and community-based natural resource management separately, limited research has systematically examined how CSR environmental programs generate triple bottom line impacts through community organizing approaches. Studies by Haryanto et al. (2019) documented farmer participation in irrigation management but did not assess economic and environmental outcomes comprehensively. Research by Kusumawati & Syaukat (2020) analyzed the sustainability of irrigation systems yet did not examine the role of external stakeholders such as corporations in supporting community initiatives. Dewi et al. (2021) explored CSR in agricultural contexts but focused primarily on corporate perspectives rather than community-level impacts across multiple dimensions. The existing gap in literature becomes particularly evident when examining irrigation management as a CSR domain. Previous studies have predominantly analyzed either CSR impacts from corporate perspectives (Hidayat & Sumaryono, 2018) or community participation in water management without considering external support mechanisms (Tumpu et al., 2022). Few studies have employed triple bottom line framework to assess the multidimensional impacts of CSR-supported community water management initiatives. Furthermore, research examining the mechanisms through which CSR transitions from charitable giving to empowerment-based shared value creation remains scarce, especially in Indonesian rural contexts.

The Irrigation Volunteer Forum (*Forum Relawan Irigasi/FRI*) in the Pusur Sub-Watershed, Klaten District, Central Java, provides a compelling case for examining these interconnections. Established in 2022 through participatory processes involving local farmers, government agencies, and CSR support from private companies, FRI represents a community-based water management model that emerged from grassroots needs rather than external imposition. The forum has demonstrated notable achievements in restoring irrigation infrastructure, reducing water-related conflicts, improving agricultural productivity, and strengthening social cohesion. These outcomes suggest that FRI embodies the principles of triple bottom line sustainability and shared value creation. This research addresses the literature gap by comprehensively analyzing the triple bottom line impacts of the FRI program as a CSR-supported community-based water management initiative. The study employs community organizing theory and shared value framework to examine how participatory approaches in irrigation management generate measurable benefits across social, economic, and environmental dimensions. Specifically, this research investigates three interrelated questions: (1) What are the quantifiable social, economic, and environmental impacts of the FRI program? (2) How do community organizing processes mediate the relationship between CSR support and triple bottom line outcomes? (3) What factors contribute to the transformation of CSR from charitable assistance to sustainable empowerment?

The significance of this research extends beyond academic contributions to practical implications for CSR policy and implementation in Indonesia. First, by providing empirical evidence of triple bottom line impacts from community-based environmental CSR, this study offers corporations a replicable model for designing more effective and sustainable programs (Elkington, 1997). Second, the research demonstrates how participatory approaches and community organizing can transform CSR from cost centers into value creation investments that benefit multiple stakeholders simultaneously (Porter & Kramer, 2011; Rothman et al., 2008). Third, the findings inform government policies on integrating CSR with community development initiatives in natural resource management sectors. Finally, this study contributes to theoretical advancement by bridging CSR literature, community organizing scholarship, and sustainable development frameworks within the context of irrigation management (United Nations, 2015).

The originality of this research lies in its comprehensive application of the triple bottom line framework to assess a CSR-supported community water management program, employing qualitative methods to document impacts across people, planet, and profit dimensions (Elkington, 1997). Unlike previous studies that examine these dimensions separately or focus solely on corporate or community perspectives, this research analyzes the interactions between CSR support, community organizing processes, and multidimensional sustainability outcomes. The findings challenge conventional assumptions regarding CSR effectiveness and propose an alternative paradigm in which corporations function as catalysts for community empowerment and shared value creation rather than providers of temporary assistance (Porter & Kramer, 2011).

## 2. Methods

### 2.1 Research design and study area

This research employed a qualitative approach with a case study design to explore and analyze the triple bottom line impacts of the Irrigation Volunteer Forum (FRI) program in the Pusur Sub-Watershed, Klaten District, Central Java. The case study method was selected following Yin (2018) because it enables in-depth investigation of contemporary phenomena within real-life contexts, particularly when boundaries between phenomenon and context are not clearly evident. This approach was appropriate for examining the complex interactions between CSR support, community organizing processes, and multidimensional sustainability outcomes in irrigation management.

The research was conducted in Juwiring Village, Juwiring Sub-district, Klaten District, Central Java, specifically in the Bagor Irrigation Area. This location was purposively selected based on several criteria: (1) the presence of FRI Jogo Toya Kamulyan as a pioneer irrigation volunteer movement in Klaten District, (2) CSR involvement from private companies supporting community water management activities, (3) the availability of documented data on irrigation system conditions before and after forum establishment, and (4) accessibility for intensive fieldwork. As a downstream area experiencing water scarcity challenges, Juwiring Village demonstrated how communities independently organize to manage water resources for agriculture with multi-stakeholder support, including CSR funding.

### 2.2 Data collection

Data collection was conducted from October to December 2024 through multiple techniques to ensure triangulation and data validity. In-depth interviews were conducted with 25 informants selected through purposive and snowball sampling techniques, comprising FRI volunteers and management (8 persons), farmers from six villages in the irrigation area (10 persons), village government officials (3 persons), representatives from the Public Works and Spatial Planning Agency (2 persons), and CSR representatives from supporting companies (2 persons). Interview duration ranged from 20 minutes to 2 hours

depending on informant characteristics and information depth. Semi-structured interview guides were developed based on research questions covering CSR involvement, community organizing processes, and social, economic, and environmental impacts. All interviews were conducted in Indonesian with informed consent and audio-recorded for transcription purposes.

Participatory observation was undertaken through active engagement in forum meetings, field activities, and regular community gatherings throughout the research period. The researcher attended three monthly meetings, two irrigation channel cleaning activities (*gotong royong*), and one multi-stakeholder evaluation meeting. Observations focused on interaction patterns among members, decision-making processes, stakeholder roles, and collective action dynamics in irrigation management. Field notes were systematically recorded using observation protocols.

Document analysis examined forum meeting minutes (2022–2024), activity reports, village government documents, CSR proposals and reports, irrigation network maps, and local policies related to water resource management. Content analysis techniques were used to identify themes, patterns, and evidence relevant to the research objectives. Supporting documentation, including photographs, audio recordings, and field notes, was collected with appropriate permissions. Audio recordings were transcribed verbatim for analysis.

### 2.3 Data analysis

Data analysis followed the interactive model developed by Miles et al. (2014), consisting of data condensation, data display, and conclusion drawing. Data condensation involved selecting, focusing, simplifying, abstracting, and transforming raw data obtained from interviews, observations, and documents. Initial analysis employed open coding to identify emerging themes, followed by axial coding to develop categories and establish relationships among codes. Focused coding was then applied to identify the most significant themes related to triple bottom line impacts and community organizing processes.

Data display organized condensed information into matrices, charts, and thematic networks to facilitate pattern identification and comparison across data sources. Separate analytical matrices were developed for social, economic, and environmental dimensions. Conclusion drawing involved interpreting patterns, explanations, causal relationships, and propositions emerging from the data. Findings were continuously verified through revisiting field notes, discussions with colleagues, and examination of negative cases that challenged emerging interpretations.

### 2.4 Research trustworthiness and ethical considerations

Research quality was ensured through credibility, transferability, dependability, and confirmability. Credibility was established through prolonged engagement in the field, persistent observation, and triangulation of data sources and methods. Member checking was conducted by sharing preliminary findings with key informants to verify accuracy and interpretation. Transferability was enhanced through detailed descriptions of the research context, participants, and processes. Dependability was maintained through systematic documentation of research procedures and analytical decisions, while confirmability was supported through researcher reflexivity and evidence-based interpretation.

Ethical considerations guided all stages of the research. Informed consent was obtained from all participants after explaining the research objectives, procedures, potential risks and benefits, and participants' rights to withdraw at any time. Confidentiality was maintained through the use of initials or role descriptions rather than real names. Digital data were securely stored on password-protected devices. The research protocol received approval from the village government and FRI leadership before fieldwork commenced. Principles of beneficence and justice were applied throughout the research process.

### 3. Results and Discussion

#### 3.1 Social dimension impacts of community-based CSR program

The establishment of FRI with CSR support generated substantial social impacts that transformed community dynamics in irrigation management. Analysis of interview data and observation findings revealed four primary social outcomes: conflict reduction, trust building, solidarity strengthening, and institutional capacity enhancement. Conflict reduction in water distribution emerged as the most immediate social impact of the FRI program. Prior to forum establishment, water allocation disputes occurred frequently among farmers, particularly between upstream and downstream areas. Interview data indicated that conflicts arose monthly during dry season, with upstream farmers taking water without considering downstream needs. One downstream farmer stated that before FRI, there were no clear rules for water sharing and farmers competed to get water first. CSR-supported infrastructure rehabilitation and forum-facilitated rule-making processes reduced these conflicts dramatically. Table 1 presents quantitative evidence of social impact changes.

Table 1. Social impacts before and after FRI establishment

Social Aspect	Before FRI	After FRI	Change
Water distribution conflicts	Monthly occurrences	Rare, resolved through dialogue	90% reduction
Inter-farmer trust level	Low, mutual suspicion	High, transparent sharing	66 percentage point increase
Inter-village communication	Limited, no coordination platform	Regular monthly meetings	Established formal mechanism
Community cooperation activities	Rare, sporadic	Monthly routine gotong royong	Institutionalized practice
Problem-solving mechanism	Individual or small group	Collective forum-based deliberation	Systematic approach
Farmer participation rate	Low, focus on individual plots	High, active in forum activities	73% increase

Trust building among farmers represented a fundamental shift in social relations facilitated by FRI organizing processes and supported by CSR investments in transparent water management infrastructure. Before forum establishment, mutual suspicion characterized farmer interactions, with each individual prioritizing personal interests over collective welfare. The participatory transect activities, joint infrastructure repairs funded partly by CSR, and transparent water allocation systems created conditions for trust development. Farmers began to believe that others would adhere to agreed rules and that benefits would be distributed fairly. This trust extended beyond water management to other agricultural cooperation activities and social relations more broadly. Solidarity strengthening manifested through enhanced sense of collective identity and mutual support among forum members. The tradition of gotong royong (mutual cooperation), which had weakened in previous years, was revitalized through FRI activities. Monthly canal cleaning activities brought farmers from different villages together in physical labor, creating opportunities for social bonding and shared purpose. When individual farmers faced difficulties such as illness or family emergencies, other members voluntarily assisted with their agricultural work. This solidarity was not merely instrumental for irrigation management but reflected deeper community cohesion. One FRI volunteer explained that the forum helped farmers remember that they are one community depending on the same water source, so they must help each other.

Institutional capacity enhancement occurred as FRI developed from an informal gathering into a formally recognized organization with clear governance structures, standard operating procedures, and demonstrated ability to mobilize resources and implement programs. CSR support played a crucial role in this institutionalization process

by providing technical assistance for organizational development and legitimacy through formal partnerships. The forum established a complete organizational structure with chairperson, secretary, treasurer, and area coordinators for each village. Standard operating procedures were developed for activities ranging from routine maintenance scheduling to emergency response protocols during droughts or floods. Documentation systems for meeting minutes, activity reports, and financial records became institutionalized practices. This organizational capacity enabled FRI to interact effectively with government agencies, negotiate CSR partnerships, and represent farmer interests in broader water governance forums at sub-district and district levels.

The social impacts documented in this study align with community organizing theory which emphasizes that effective collective action requires building collective consciousness, developing organizational capacity, and fostering solidarity among participants (Gilchrist & Taylor, 2022). The FRI case demonstrates how external support through CSR can catalyze these processes without undermining community autonomy, a balance that is often difficult to achieve in development interventions. The transformation from conflict-ridden to cooperative water management reflects what Ostrom (1990) described as successful common pool resource governance emerging from locally developed institutional arrangements rather than externally imposed solutions.

### 3.2 Economic dimension impacts of community-based CSR program

Economic impacts of the FRI program manifested through cost savings, productivity increases, and income improvements for participating farmers. These outcomes resulted from improved irrigation infrastructure, more efficient water distribution, and reduced reliance on costly pumping technologies. The economic analysis revealed that CSR investments in community-based water management generated measurable financial returns for farmers while simultaneously creating shared value for supporting corporations through enhanced community relations and environmental sustainability contributions. Elimination of pumping costs constituted the most immediate and quantifiable economic benefit for farmers. Prior to FRI establishment and CSR-supported infrastructure rehabilitation, many farmers relied on diesel, gasoline, or LPG-powered pumps to extract water from canals or groundwater sources due to blocked or damaged irrigation channels. Table 2 presents detailed data on pumping cost savings achieved through gravity-based irrigation restoration.

Table 2. Economic impact of eliminating pumping costs through irrigation rehabilitation

Village sample	Land area (m <sup>2</sup> )	Fuel type used	Total pumping cost per season before FRI (IDR)	Changes after FRI
Juwiring	2,600	Diesel	589,000	100% cost savings; pump operation time reallocated
Bulurejo	1,200	LPD Gas	340,000	No LPG purchase needed; smooth irrigation
Kwarasan	2,300	Gasoline	900,000	Zero cost; fuel and labor saved
Tanjung	2,200	Gasoline	550,000	Pump no longer used; focus shifted to cultivation
Kenaiban	2,000	Gasoline	525,000	No fuel queuing; automatic irrigation flow
Bolopleret	2,200	Gasoline	500,000	Full savings; productivity increased
Average	2,083	-	-	Complete cost elimination

The data demonstrate that average pumping cost savings reached IDR 567,333 per season per farmer, equivalent to approximately 15-20% of gross income from rice cultivation depending on yield levels. These savings directly improved net farm income and allowed farmers to reallocate financial resources to other productive inputs such as quality seeds, fertilizers, or pest management. Beyond direct cost savings, farmers also saved time

and labor previously spent operating and maintaining pumps, which could be redirected to crop care activities that enhance productivity. Idle land reduction represented another significant economic impact resulting from restored water access. Before FRI establishment, 11.3 hectares across six villages in the irrigation area remained unplanted during dry season due to insufficient water supply. CSR-supported channel rehabilitation and forum-managed water distribution enabled these previously unproductive lands to be cultivated. Table 3 presents quantitative data on idle land reduction across villages.

Table 3. Idle land reduction through improved irrigation access

Village sample	Idle land before FRI (Ha)	Idle land after FRI (Ha)	Change (Ha)	Reduction percentage
Juwiring	3.57	2.0	1.57	44.0%
Bulurejo	2.86	1.2	1.66	58.0%
Kwarasan	0.20	0.05	0.15	75.0%
Tanjung	2.80	1.0	1.80	64.3%
Kenaiban	1.60	0.7	0.90	56.3%
Bolopleret	0.27	0	0.27	100%
Average		4.95	6.35	56.2%

The 56.2% reduction in idle land translates to 6.35 additional hectares brought into production. Assuming average rice yield of 5 tons per hectare and farm gate price of IDR 5,000 per kilogram, this land restoration generated approximately IDR 158,750,000 in additional gross agricultural output per season for the community. This calculation does not account for input costs, but even with typical cost-to-revenue ratios of 40-50% in Indonesian rice farming, the net income increase represents substantial economic value creation at community level. Agricultural productivity improvements occurred through multiple mechanisms beyond water access alone. Reliable irrigation enabled farmers to maintain optimal planting schedules aligned with seasonal patterns, reducing crop failure risks. Consistent water supply throughout growing season supported better crop growth and yield potential. Reduced stress from water scarcity concerns allowed farmers to invest more attention and resources in other productivity-enhancing practices such as integrated pest management and proper fertilization. While this research did not conduct systematic yield measurements, interview data consistently indicated farmer perceptions of productivity improvements ranging from 10-25% depending on land location and management practices.

Income improvements at household level resulted from the combined effects of cost savings, increased cultivated area, and productivity gains. Farmers reported being able to plant two full crops per year rather than one crop plus idle season or low-value crops. The ability to reduce pumping costs allowed reallocation of income to household consumption, children's education, or savings. Several farmers mentioned using cost savings to purchase motorcycles or home improvements, indicating that economic impacts extended beyond agricultural production to broader household welfare. The economic impacts documented in this study provide empirical support for shared value creation theory (Porter & Kramer, 2011). CSR investments in community-based irrigation management generated clear economic benefits for farmers while simultaneously creating value for supporting corporations through enhanced community relations, improved environmental sustainability records, and demonstrated social impact achievements that strengthen corporate reputation. This represents a shift from traditional CSR as charitable expense to CSR as strategic investment that aligns business objectives with community welfare.

From development economics perspective, the FRI case illustrates how infrastructure investments combined with institutional development can trigger positive economic multiplier effects (Rosenstein-Rodan, 1943). The initial CSR funding for canal rehabilitation catalyzed a chain of economic improvements: reduced costs, expanded production, increased income, enhanced consumption, and broader community economic vitality. This aligns with theories of poverty reduction through asset-based community development

which emphasize that empowering communities to manage productive assets generates more sustainable outcomes than direct welfare transfers (Mathie & Cunningham, 2003).

### *3.3 Environmental dimension impacts of community-based CSR program*

Environmental impacts of the FRI program encompassed physical infrastructure restoration, ecosystem preservation, water resource efficiency improvements, and enhanced environmental consciousness among community members. These outcomes demonstrate how community-based CSR can achieve tangible ecological benefits through participatory management approaches that integrate local knowledge with technical expertise and financial resources (FAO, 2020; United Nations, 2023). Environmental consciousness raising among community members emerged as an important intangible impact of FRI activities. Through participatory transect, regular meetings, and collaborative management experiences, farmers developed deeper understanding of watershed dynamics, water cycle processes, and the environmental importance of maintaining irrigation infrastructure. Farmers increasingly recognized their role as environmental stewards responsible for preserving water resources for future generations. This transformation is consistent with studies showing that participatory environmental governance enhances stewardship behavior, collective responsibility, and long-term resource conservation (Armitage et al., 2020; Reed et al., 2022).

The environmental impacts documented in this study align with political ecology and community-based natural resource management perspectives (Ostrom, 1990; Agrawal, 2001). Effective environmental governance emerges when communities possess clear resource boundaries, participatory decision-making mechanisms, monitoring systems, conflict-resolution procedures, and recognized rights to self-organize (Ostrom, 1990; FAO, 2020). The FRI case demonstrates how CSR support can strengthen these institutional conditions while maintaining community ownership and decision-making authority. From the perspective of environmental CSR, the findings support arguments that corporate sustainability initiatives generate greater environmental outcomes when they empower local communities rather than relying solely on top-down interventions (Banerjee, 2008; Porter & Kramer, 2011). Such approaches promote environmental learning, local ownership, and long-term commitment, which are essential for sustainable resource management and resilience-building in rural communities (UNDP, 2022; United Nations, 2023).

### *3.4 Mechanisms linking CSR support to triple bottom line outcomes*

Analysis of FRI case data reveals specific mechanisms through which CSR support contributed to triple bottom line impacts. Understanding these mechanisms is crucial for replicating and scaling this model in other contexts. Five primary mechanisms emerged from the data: catalytic funding, legitimacy enhancement, capacity building, multi-stakeholder coordination, and sustained engagement. These mechanisms are consistent with recent studies emphasizing the role of cross-sector partnerships and collaborative governance in achieving sustainable development outcomes (United Nations, 2023; World Bank, 2022). The catalytic funding mechanism describes how strategic CSR investments triggered broader community mobilization and resource leveraging. CSR contributions typically covered 30–40% of infrastructure rehabilitation costs, while the remaining resources originated from government budget allocations (40–50%), community in-kind labor contributions (10–15%), and village funds (5–10%). This cost-sharing arrangement promoted community ownership while ensuring adequate resources for implementation. CSR funding functioned as seed capital that increased project feasibility and attracted additional support from other stakeholders. Similar findings have been reported in studies highlighting the catalytic role of CSR investments in community development and collective action initiatives (Porter & Kramer, 2011; OECD, 2021).

The legitimacy enhancement mechanism operated through formal recognition and external validation, strengthening FRI's position within local governance structures. Corporate partnerships signaled credibility to government agencies, village authorities, and community members, thereby facilitating collaboration and participation. Corporate involvement also introduced professional management standards, accountability systems, and documentation practices that enhanced organizational effectiveness. Previous research similarly demonstrates that external institutional support can increase community organizations' legitimacy and governance capacity (Ansell & Gash, 2008; Emerson & Nabatchi, 2015). The capacity-building mechanism encompassed technical training, organizational development, and knowledge transfer provided through CSR programs and partner organizations. Training activities improved competencies in participatory planning, financial management, infrastructure maintenance, and leadership. This combination of formal training and experiential learning strengthened both individual and organizational capabilities, which are essential for long-term sustainability (UNDP, 2022).

These mechanisms align with theories of social capital and network governance (Putnam, 2000; Ansell & Gash, 2008). CSR support strengthened both bonding social capital within communities and bridging social capital between communities and external actors, creating network structures that facilitated collective action and resource mobilization. The multi-stakeholder coordination approach also reflects collaborative governance principles in which actors with diverse resources and authorities work together through deliberative processes to achieve shared objectives (Emerson & Nabatchi, 2015; OECD, 2021).

### *3.5 Factors enabling transformation from charity to empowerment*

Comparative analysis of FRI with less successful CSR environmental programs in other locations reveals specific factors that enabled the transformation from charitable assistance to sustainable empowerment. Understanding these enabling factors provides practical guidance for designing more effective community-based CSR initiatives. Community organizing foundation emerged as the most critical enabling factor. FRI was not created by external actors but originated from community-initiated transect and problem identification processes. CSR support was sought by the community to address problems they had already identified and begun addressing collectively, rather than CSR offering predetermined solutions. This sequence ensured that activities responded to genuine community needs and priorities, fostering ownership and commitment. Such findings are consistent with community organizing and participatory development literature emphasizing local ownership as a prerequisite for sustainable development outcomes (Rothman et al., 2008; Chambers, 2017).

Participatory planning and implementation practices throughout the program cycle maintained community agency and decision-making authority. Forum members collectively determined priorities, developed work plans, allocated resources, and evaluated outcomes rather than merely implementing externally designed projects. CSR representatives participated as facilitators and resource persons while respecting community decisions. This approach reflects principles of collaborative governance and participatory resource management, which have been associated with improved sustainability and stakeholder commitment (Ansell & Gash, 2008; Emerson & Nabatchi, 2015). Voluntary leadership and member commitment provided sustained energy and legitimacy independent of external incentives. FRI leaders and active members served without monetary compensation, motivated by social responsibility, collective welfare, and mutual assistance values. Such voluntary engagement reflects the importance of social capital and collective action in sustaining community-based institutions (Putnam, 2000; Ostrom, 1990).

Transparent governance and accountability mechanisms built trust among stakeholders and community members. Clear financial management procedures, participatory evaluations, and community audits reduced opportunities for elite capture and strengthened institutional legitimacy. Previous studies have highlighted transparency and accountability as critical components of effective local governance and community

empowerment initiatives (OECD, 2021; World Bank, 2022). Adaptive management flexibility allowed continuous adjustment to changing conditions and implementation challenges. This adaptive approach enabled stakeholders to respond effectively to unforeseen circumstances while maintaining program objectives. Adaptive management has been widely recognized as a key factor in successful natural resource governance and community resilience (Armitage et al., 2020; FAO, 2020).

Gender inclusivity, although not yet fully achieved, broadened participation and incorporated women's perspectives into irrigation management decisions. Women's involvement in meetings, collective activities, and decision-making processes contributed to more inclusive governance arrangements. Research on gender and water governance demonstrates that inclusive participation improves both equity and resource management outcomes (UN Women, 2023; FAO, 2023). Collectively, these enabling factors created conditions for transforming CSR from temporary charitable assistance into sustainable community empowerment. The FRI case illustrates how corporations, governments, and communities can collaborate to generate shared value while simultaneously advancing social, economic, and environmental sustainability objectives (Porter & Kramer, 2011; United Nations, 2023).

### *3.6 Challenges and limitations of community-based CSR model*

Despite documented successes, the FRI program faced ongoing challenges that reveal limitations of community-based CSR models and indicate areas requiring continued attention to ensure long-term sustainability. Recognizing these challenges provides balanced assessment and identifies priorities for program strengthening. Financial sustainability after CSR withdrawal emerged as the most significant challenge threatening program continuity. While CSR funding enabled initial infrastructure rehabilitation and organizational development, questions remained about how FRI would finance future maintenance and operational costs if corporate support ended. Village budget allocations provided modest annual support, but amounts were insufficient for major repairs or expansion activities. Member contributions through informal dues collected during meetings generated minimal funds given farmers' limited cash incomes. Some FRI leaders expressed concern that enthusiasm might decline if infrastructure deteriorated again due to inadequate maintenance resources, potentially reverting to pre-forum conditions.

Technical capacity limitations constrained FRI's ability to address complex infrastructure problems or water management challenges beyond routine maintenance. While volunteers gained practical skills through experience, they lacked formal training in civil engineering, hydrology, or advanced irrigation management techniques. When confronted with major structural failures, sophisticated water distribution optimization needs, or integration with broader watershed management systems, the forum required external technical expertise. Dependence on government engineers or consultants for technical guidance limited community self-reliance and could delay problem resolution if external support was unavailable. Inter-village coordination challenges occasionally surfaced despite general solidarity, particularly during severe water scarcity when upstream and downstream interests diverged. Establishing fair allocation rules during normal conditions proved easier than enforcing them under drought stress when farmers faced potential crop failures. Conflicts over water distribution priority between different crops, tensions between agricultural and household water needs, and disputes about maintenance cost sharing among villages with unequal land areas and farmer numbers required continuous negotiation and compromise. The forum's conflict resolution mechanisms functioned adequately for routine disputes but faced tests during extreme conditions.

External dependencies on government approvals and CSR partnership continuation meant that FRI could not operate entirely autonomously despite community-based structure. Infrastructure modifications required permits from irrigation agencies, access to certain equipment needed government facilitation, and major rehabilitation projects

exceeded community resources alone. Corporate CSR programs operated on annual or multi-year planning cycles determined by corporate policies and budgets beyond community control. Changes in government officials, corporate CSR strategies, or political-economic contexts could disrupt established partnerships, forcing forum to adapt or seek alternative support sources. Gender participation remained superficial with women's involvement limited to attendance at meetings and specific activities rather than substantive decision-making roles or leadership positions. Traditional patriarchal norms continued to influence irrigation governance despite formal inclusivity commitments. Women's practical knowledge about household water needs and environmental observations was underutilized in planning processes. Achieving genuine gender equality in natural resource management required deeper cultural change beyond formal policies or tokenistic participation. These challenges and limitations do not negate the substantial achievements and positive impacts of the FRI program, but rather contextualize them within realistic assessments of complex development processes. Addressing these challenges requires ongoing commitment from all stakeholders, continued innovation in organizational and financial mechanisms, and patience to achieve incremental improvements rather than expecting perfect or permanent solutions.

### *3.7 Implications for CSR policy and practice*

The FRI case study generates several important implications for corporate CSR policy and implementation practices, particularly in environmental and natural resource management domains. These insights can inform more effective and sustainable CSR program design in Indonesia and similar developing country contexts. First, CSR environmental programs should prioritize community empowerment over project delivery. Rather than designing and implementing projects for communities, corporations should invest in strengthening community capacity to identify problems, develop solutions, mobilize resources, and manage initiatives independently. This empowerment approach requires longer time horizons, more flexible processes, and willingness to share control compared to traditional project implementation models, but generates more sustainable outcomes that persist beyond corporate involvement. The FRI case demonstrates that relatively modest CSR investments can catalyze substantial community-led improvements when focused on empowerment rather than dependency creation.

Second, effective CSR requires genuine multi-stakeholder partnerships with clearly defined roles, responsibilities, and accountability mechanisms. Corporations should not attempt to substitute for government responsibilities or operate independently from existing governance structures, but rather facilitate coordination among diverse actors with complementary capabilities. This partnership approach leverages collective resources and expertise more effectively than any single actor working alone, while distributing risks and responsibilities across multiple stakeholders. Clear partnership agreements, regular communication, and transparent monitoring ensure that all parties fulfill commitments and that power imbalances do not enable domination by any single stakeholder. Third, CSR program design should build upon existing community social capital, cultural values, and organizational structures rather than imposing external models. Understanding and respecting local traditions such as *gotong royong*, identifying and supporting existing community leaders, and aligning program activities with cultural practices enhance participation and sustainability. This culturally grounded approach requires corporations to invest time in community engagement and participatory assessment before initiating activities, resisting pressures for rapid implementation that sacrifice understanding of local contexts.

Fourth, CSR impact assessment should employ triple bottom line frameworks that measure social, economic, and environmental outcomes comprehensively rather than focusing narrowly on outputs or single-dimensional impacts. Corporations should invest in rigorous monitoring and evaluation systems that document changes across multiple indicators over sufficient time periods to assess sustainability. The FRI case provides a

model for defining measurable indicators of social impact (conflict reduction, trust building, participation rates), economic impact (cost savings, productivity improvements, income changes), and environmental impact (infrastructure conditions, land restoration, resource efficiency) that enable credible assessment of program contributions to community welfare and ecosystem health. Fifth, CSR programs should incorporate explicit strategies for financial sustainability beyond corporate funding. This may include facilitating community access to government programs, supporting development of community financing mechanisms, connecting communities with other resource sources, and gradually reducing corporate contributions as community capacity strengthens. Planning for eventual corporate withdrawal from the beginning ensures that communities develop necessary capabilities and resource mobilization strategies rather than becoming permanently dependent on CSR support.

Sixth, corporations should recognize CSR as strategic investment in shared value creation rather than charitable expense or public relations activity. The business case for community-based environmental CSR includes enhanced corporate reputation, improved community relations facilitating business operations, demonstrated environmental stewardship meeting stakeholder expectations, and contributions to sustainable development goals increasingly demanded by investors and consumers. Reframing CSR as value creation rather than cost enables more sustained corporate commitment and integration with core business strategies. These policy and practice implications challenge conventional CSR approaches common in Indonesia where corporations often implement short-term, output-focused projects with limited community participation or sustainability planning. The FRI case demonstrates that alternative models based on empowerment, partnership, cultural grounding, comprehensive impact assessment, financial sustainability, and shared value creation can achieve superior outcomes benefiting communities, environment, and corporations simultaneously.

#### 4. Conclusions

This study provides empirical evidence that community-based CSR environmental programs can generate significant triple bottom line impacts when designed through empowerment rather than charity-driven approaches. The Irrigation Volunteer Forum (FRI) in Klaten, Central Java demonstrates how strategic CSR investments, combined with community organizing and multi-stakeholder partnerships, create shared value across social, economic, and environmental dimensions. Socially, the program substantially reduced water distribution conflicts, built inter-farmer trust, revitalized mutual cooperation traditions, and strengthened institutional capacity. Economically, it eliminated pumping costs averaging IDR 567,333 per season per farmer, restored 6.35 hectares of previously idle land, and improved household agricultural incomes. Environmentally, it rehabilitated degraded irrigation infrastructure, restored channel ecosystems, improved water-use efficiency, and raised environmental stewardship awareness among community members.

These outcomes were mediated by five key mechanisms — catalytic funding, legitimacy enhancement, capacity building, multi-stakeholder coordination, and sustained engagement — rooted in enabling factors such as community-led organizing, participatory planning, voluntary leadership, transparent governance, and cultural grounding in local traditions. The findings challenge conventional top-down CSR models and propose an alternative paradigm in which corporations serve as catalysts for community empowerment and sustainable value creation. This study contributes to CSR literature, community development scholarship, and environmental governance frameworks by offering a replicable model applicable to similar rural resource management contexts. Future research should explore the long-term sustainability of such programs after corporate withdrawal and assess comparative effectiveness across different CSR models and settings.

## **Acknowledgement**

The author would like to express sincere gratitude to the Irrigation Volunteer Forum (*Forum Relawan Irigasi/FRI*) Jogo Toya Kamulyan, farmers, village officials, CSR representatives, and all stakeholders in Juwiring Sub-district, Klaten District, for their valuable participation, support, and insights throughout this research.

## **Author Contribution**

The author solely contributed to the conceptualization, methodology, data collection, formal analysis, investigation, writing of the original draft, review and editing, and final approval of the manuscript.

## **Funding**

This research received no external funding.

## **Ethical Review Board Statement**

This study was conducted in accordance with ethical research principles. Permission to conduct the research was obtained from the relevant local authorities, including the village government and the leadership of the Irrigation Volunteer Forum (FRI), prior to data collection.

## **Informed Consent Statement**

Informed consent was obtained from all participants involved in this study. Participants were informed of the research objectives, procedures, confidentiality measures, and their right to withdraw from the study at any time.

## **Data Availability Statement**

The data supporting the findings of this study are available from the author upon reasonable request. Due to privacy and confidentiality considerations, the data are not publicly available.

## **Conflicts of Interest**

The author declares no conflict of interest.

## **Declaration of Generative AI Use**

The author declares that generative artificial intelligence (AI) tools were used solely for language editing and grammar improvement. All research activities, including study design, data collection, analysis, interpretation of findings, and manuscript preparation, were conducted and verified by the author, who assumes full responsibility for the content of this article.

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