Engagement:
Jurnal Pengabdian kepada Masyarakat
Vol. 10, No. 03, August, 2026, pp. 591 – 614
ISSN: 2579-8375 (Print), ISSN: 2579-8391 (Online)
https://engagement.fkdp.or.id/index.php/engagement

Improving Vocational Skills and Reducing Textile Waste through Sashiko-Based Community Training: A Social Return on Investment Analysis

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ABSTRACT

Background: The Wastra Bumi Community Development Program addresses textile waste as a social and environmental issue by empowering local communities through the Japanese Sashiko technique. The initiative promotes circular economy practices and Creating Shared Value (CSV) by transforming discarded fabrics into wearable art. The program focuses on underprivileged groups, vocational students, and small creative industries to support sustainable livelihoods and waste reduction.

Purpose of the Study: To evaluate the social, environmental, and economic impacts of the Wastra Bumi program using the Social Return on Investment (SROI) approach.

Methods: The study involved 20 stakeholders and collected data through field observation, surveys, financial records, and interviews, monetized using national and international proxies.

Results: The program generated an SROI ratio of 6.29:1 within one year and 16.62:1 over a three-year projection. The program engaged 240 vocational students and diverted approximately 550 kg of textile waste. It demonstrates that vocational training and multi-sector collaboration deliver strong socio-environmental value**.** These findings highlight the effectiveness of community-based circular economy interventions in generating measurable and scalable social impact.

Keywords
Social Return on Investment (SROI); Circular Economy; Creating Shared Value (CSV); Textile Upcycling; SDGs

Article History:
Received: Oct 21th 2025
Revised: May 03th 2026
Accepted: August, 17th 2026

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Introduction

Environmental and social sustainability have become central concerns on the global development agenda. A mounting challenge is textile waste, driven largely by the fast fashion business model that prioritizes mass production without adequate recycling systems. It is estimated that more than 92 million tonnes of textile waste are generated annually, potentially rising to between 134 and 148 million tonnes by 2030 if significant policy intervention is not implemented (Khan et al., 2023; Lu et al., 2022; Sharma et al., 2022).

The textile industry also contributes substantially to carbon emissions and water consumption, accounting for about 10 percent of global carbon emissions and 20 percent of industrial wastewater, with annual water usage estimated at 79 trillion liters (Bailey et al., 2022). In regions such as Latin America, adoption of circular economy principles in the textile sector remains very low, below 5 percent (Oliveira Silva & Morais, 2022). Globally, textile recycling rates hover around 15 percent, while over 70 percent of textile waste in developing countries is sent directly to landfills without further processing (Khan et al., 2023). Moreover, closed-loop recycling currently converts only about 1 percent of waste into new garments (Lahtela et al., 2021).

In response to limited waste management, technological innovations have emerged with promising solutions. Regenerative cellulose fibers derived from waste can increase tensile strength by up to 35 percent compared to conventional recycled fibers, and incorporating 30% textile waste in HDPE composites can enhance impact strength by up to 40 percent (Lahtela et al., 2021). However, scaling these innovations to industrial levels faces challenges including infrastructure, technical standards, and supportive policies.

Fast fashion's impacts extend beyond environmental harm to encompass social issues. The model promotes excessive consumption and rapid production cycles with low prices and frequent collections, leading to environmental externalities and exploitative labor practices, ranging from low wages and hazardous working conditions to child labor (Arrigo, 2020; Zhang et al., 2021; Bailey et al., 2022).

As an alternative, the circular economy offers a reduce–reuse–recycle–remanufacture framework to break linear production–waste cycles. Its implementation in textiles includes the use of eco-friendly materials like Tencel and organic cotton, internal recycling initiatives, such as H&M's "Take Care" and "Conscious Collection" and strengthening community-based recycling ecosystems like Wastra Bumi. However, adoption remains limited. Consumption sufficiency strategies are embraced by only a few industries and require regulatory and behavioral shifts (Garcia-Ortega et al., 2023). Only 15–20 percent of fast fashion consumers tend to shift toward sustainable consumption, often motivated by personal values such as self-transcendence and openness to change (Stringer et al., 2020). Widespread greenwashing further undermines consumer trust in sustainability claims (Lu et al., 2022).

In line with sustainability paradigms, Creating Shared Value (CSV), as conceptualized by Porter and Kramer, provides a strategic framework that simultaneously fosters economic and social value. CSV has proven effective across sectors. In developing-country banking, CSV-based entrepreneurship education boosts financial inclusion and bank profitability (Taskin et al., 2023). In SMEs, geographic, organizational, and institutional proximity strengthen alliance capabilities, driving economic and social performance (Shirasawa & Seo, 2025). In digital manufacturing, CSV-based sharing-economy ecosystems promote cross-partner innovation (Rong et al., 2021), and open patent pools accelerate knowledge spillover among tech companies (Kwon et al., 2023). In HR, family-like social enterprises in Bangladesh enhance employee social stability (Ferdousi & Abedin, 2023), while knowledge-sharing collaborations in Spanish entrepreneurial clusters elevate local business sustainability.

Within the Wastra Bumi Program, the sashiko technique adds a unique dimension. Rooted in Japanese tradition, sashiko has evolved into a form of physical and mental therapy and a culturally expressive medium, aligned with the mottainai philosophy of waste aversion. Thus, sashiko not only extends textile product lifecycles but also enhances social value, aesthetics, and community empowerment within the circular economy framework.

Despite growing sustainability urgency, economic-based measurement of social impact remains limited. Social program evaluations typically rely on output indicators, while converting real social value into monetary terms is challenging (Ashton et al., 2024; Lee & Jung, 2025). The SROI approach addresses this gap by quantifying social, economic, and environmental benefits, including non-financial components often overlooked (Vluggen et al., 2020; Gómez-Zapata & del Barrio-Tellado, 2023).

Numerous studies confirm the success of SROI across sectors. Makanjuola et al. (2022) report SROI ratios between 2.37 and 7.08 in mental health services; Lee & Jung (2025) find a 12 percent SROI in environmental management; Refki et al. (2020) monetize public art's social impact through SROI; Gómez-Zapata & del Barrio-Tellado (2023) apply SROI to public libraries; and Vluggen et al. (2020) affirm SROI's role in enhancing public sector procurement collaboration. Building on these, the SROI measurement for Wastra Bumi aims to comprehensively map economic and social value, including waste reduction, artisan income improvement, local culture reinforcement, and circular economy contribution (Garcia-Ortega et al., 2023; Stringer et al., 2020).

Therefore, this research offers an empirical contribution by developing a measurable SROI evaluation framework to analyze community-based programs like Wastra Bumi that integrate ESG values concurrently. This framework enables cross-dimensional measurement of impact spanning financial, social, and environmental value within a rigorous evaluative context.

Method

Type and Design of Research

This study adopts a mixed-method approach that integrates both qualitative and quantitative data. The qualitative approach was employed to explore stakeholder experiences through in-depth interviews and focus group discussion, while the quantitative approach was used to monetize the social and economic impacts using the Social Return on Investment (SROI) calculation method.

In terms of design, this research is categorized as an evaluative case study, aiming not only to describe the dynamics of the *Wastra Bumi* Program but also to systematically measure its generated social impact based on SROI evaluation principles (Ashton et al., 2024; Vluggen et al., 2020; Gómez-Zapata & del Barrio-Tellado, 2023). Non-academic sources were used only to support contextual data and financial proxy estimation.

Unit of Analysis and Research Site

The main unit of analysis in this study is the *Wastra Bumi* Program, a community-based initiative that manages textile waste through clothing donations, sashiko embroidery training, and sustainable fashion exhibitions and competitions. The research site is focused on the operational area of the *Wastra Bumi* community, involving various local actors, including vocational high schools (SMKs), artisan groups, individual donors, government agencies, and business partners engaged in the circular textile value chain.

SROI Analysis Stages

The SROI calculation in this research follows the framework set by Social Value International, consisting of six main steps:

Stakeholder Identification

Key stakeholders involved in the *Wastra Bumi* Program include:

a. Underprivileged community members as direct beneficiaries
b. Vocational school (SMK) students participating in the sashiko workshops
c. Clothing donors
d. The environment (as an ecological stakeholder benefiting from waste reduction)
e. Local government as a policy partner
f. Business partners supporting the circular economy program

Theory of Change Mapping

This stage maps the causal links between inputs, outputs, outcomes, and long-term impacts, directly connecting each component to outcomes that will later be monetized.

Data Collection

Primary data were collected through:

a. Structured questionnaires to measure individual outcome changes
b. In-depth interviews with key stakeholders
c. Focus Group Discussions (FGDs) to validate the narratives of social change
d. Field observations of program activities
e. Financial data from program operations

Outcome Monetization

Outcomes were monetized using financial proxy methods, including:

a. Cost savings from beneficiaries no longer needing to buy new clothes
b. Water savings from reduced textile production
c. The equivalent value of professional sewing training received by SMK students
d. Reduced environmental burden from decreased textile waste

SROI Ratio Calculation

The SROI ratio is calculated using the formula:

$$SROI = \frac{\text{Total Monetized Social Value (Outcome Monetized)}}{\text{Total Investasi Program}} \quad (1)$$

This ratio illustrates how much social and economic benefit is generated for each unit of investment made (Vluggen et al., 2020; Ashton et al., 2024).

Sensitivity Analysis and Data Validation

To ensure the accuracy of the calculations, a sensitivity analysis was conducted on the main proxy assumptions, including deadweight, attribution, and drop-off adjustments. Validation was performed through triangulation of field data, administrative documents, and direct observation of the program.

Instruments and Validation

The instruments for data collection and SROI calculation were based on the standardized evaluation templates recommended by Social Value International (SVI), which serve as global benchmarks for social value measurement. Data validity was tested using a source triangulation method that combined interview results, questionnaire data, field observations, and the program's financial and administrative documents (Gómez-Zapata & del Barrio-Tellado, 2023; Ashton et al., 2024).

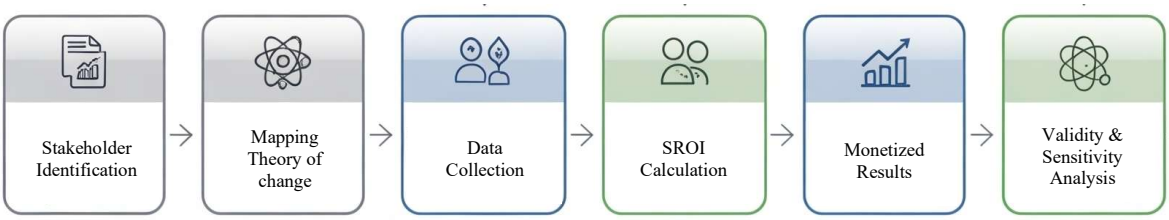

Figure 1. Social Return on Investment (SROI) Analysis Steps

Profile of the Wastra Bumi Program: An Innovative CSV Model in Community Circular Economy

The *Wastra Bumi* Program is a Creating Shared Value (CSV)-based initiative designed by Master of Management students at Universitas Airlangga. It was developed as a strategic response to the rising environmental challenges caused by textile waste, promoting a participatory solution rooted in community-based circular economy. By integrating educational, social, cultural, and environmental approaches, *Wastra Bumi* aims to minimize the negative impacts of waste while simultaneously fostering sustainable empowerment of local communities.

Main Activities

1. **Donation of Wearable Used Clothing and Industrial Textile Waste**

   Clothing was collected via a drop-point system at Campus B of Universitas Airlangga, Surabaya, from April 24 to May 10, 2025. Donations included:

   a. 195 pieces of wearable clothing: shirts, trousers, jackets, and fabric

   b. Five damaged garments and 10 kg of textile waste from Vido Garment, used as upcycling workshop material.

2. **Sashiko Workshops at Five Partner Vocational Schools**
   Sustainable textile skill training was conducted from May 8 to 15, 2025, at five partner vocational schools:

   a. SMKN 12 Surabaya

   b. SMKN 6 Surabaya

   c. SMKN 8 Surabaya

d. SMK Saintren Al-Hasan

e. SMKS Katolik Mater Amabilis Surabaya

A total of 240 vocational students participated.

Workshop content included:

a. History, philosophy, and sustainability values of Sashiko embroidery

b. Basic techniques: *Hitomezashi* and *Moyouzashi*

c. Collaborative upcycled product creation

d. Presentation and sustainability reflection sessions

3. **Wastra Bumi x Sashiko Exhibition and Competition**
The main event was held on June 9, 2025, at the Soepoyo Auditorium, Faculty of Economics and Business (FEB), Universitas Airlangga, featuring three zones:

a. **Education Zone**: Infographics on the history of Sashiko and global textile waste impact

b. **Creative Zone**: Exhibition of 60 upcycled works by students and local artists

c. **Interactive Zone**: Mini upcycling workshop for visitors

The competition included two categories:

a. **Functional Repair** – aesthetically and functionally repairing damaged clothes

b. **Artistic Embroidery** – creative embroidery designs with environmental messages

The event attracted 171 visitors from various backgrounds, including students, academics, creative practitioners, and the general public.

Location and Community Dimensions

All activities were centered in Surabaya, with key locations:

a. Campus B, Universitas Airlangga (donation drop point, exhibition, competition)

b. Partner SMKs (locations for Sashiko skills training and upcycling education)

Stakeholder Identification of the Wastra Bumi Program

In the Social Return on Investment (SROI) framework, stakeholder identification is a critical step to understand value distribution and the sources of social change in a program (Ashton et al., 2024; Vluggen et al., 2020; Gómez-Zapata & del Barrio-Tellado, 2023). The *Wastra Bumi x Sashiko* Program, as an innovative CSV model in the circular economy, involves cross-sector, multidisciplinary synergy among stakeholders playing integral roles in generating measurable social, economic, cultural, and environmental impacts.

1. Underprivileged Community, Primary beneficiaries through access to upcycled clothing, skills enhancement, and potential income opportunities (Gómez-Zapata & del Barrio-Tellado, 2023).

2. Vocational School Students, Youth empowered through vocational training and creative circular economy participation (Makanjuola et al., 2022).

3. Partner Vocational Schools (SMKs), Host institutions facilitating workshops and curriculum integration aligned with national creative industry policies.

4. Clothing Donors, Input suppliers representing sustainable consumption behavior and civic engagement (Lu et al., 2022; Refki et al., 2020).
5. The Environment, an ecological stakeholder benefiting from reduced waste, water use, and CO_2 emissions (Lee & Jung, 2025).
6. Municipal Government, Policy partners providing infrastructure, regulation, and alignment with city waste reduction strategies (Ashton et al., 2024).
7. Business Partners, SMEs, e-commerce platforms, and local fashion brands promoting upcycled product commercialization and ethical branding (Kwon et al., 2023; Rong et al., 2021).
8. Training Facilitators, Technical mentors bridging production processes with the socio-cultural aspects of Sashiko.
9. Organizing Committee, Responsible for strategic planning, logistics, monitoring, and reporting, crucial for program operations.
10. Universitas Airlangga, The academic institution supporting cross-faculty collaboration and program credibility.
11. Faculty of Economics and Business (FEB) Unair, Facilitates experiential learning and sustainable innovation dissemination.
12. Master of Management Program (FEB Unair), Synchronizes academic protocols, validates SROI methodology, and engages postgraduate students.
13. Faculty Supervisors, Ensure methodological quality, impact evaluation, and scientific rigor.
14. FEB Students, Initiators and implementers integrating management theory, social creativity, and cross-sector collaboration.
15. Sponsors, Contribute funding, goods, or logistics essential for program and exhibition continuity.
16. Media Partners, Promote, document, and educate the public to expand outreach.
17. Event Vendors, Provide technical support, equipment, and documentation to ensure a professional event atmosphere.
18. Delivery Companies, Enable logistics and efficient distribution of donations and products.
19. Guest Speakers, Share insights on Sashiko, circular economy, and social entrepreneurship.
20. Raka Raki East Java Youth Ambassadors, Represent regional identity, Gen-Z engagement, and public campaign amplification.

Community Participation Approach

Although the Wastra Bumi program was initially designed by university stakeholders, community involvement was integrated during the implementation phase. Vocational students and local participants actively contributed through feedback sessions, workshops, and collaborative production activities. Their input influenced material selection, design preferences, and workshop dynamics. However, the initial program design can be categorized as a semi top-down approach, which is acknowledged as a limitation of this study. This approach aligns with community service principles that emphasize participatory engagement and capacity building rather than purely research-driven intervention.

Result

In the SROI framework, the Theory of Change is a foundational component illustrating the causal relationship between inputs, outputs, outcomes, and final impacts (Ashton et al., 2024; Vluggen et al., 2020; Gómez-Zapata & del Barrio-Tellado, 2023). This model enables a systematic visualization of how the *Wastra Bumi* Program generates socio-economic value.

Theory of Change: Multi-Level Logic

Inputs:

a. Donated wearable clothing
b. Sashiko facilitators and mentors
c. Operational support from SMKs and universities
d. Business and municipal partners
e. Infrastructure for workshops and exhibitions

Outputs:

a. Sashiko workshops in five partner SMKs
b. Collection of ±200 garments
c. Production of ±60 upcycled items
d. Local-level exhibition and competition
e. Public education on circular fashion

Short-Term Outcomes:

a. Increased student skills in upcycling (Ma et al., 2019; Lahtela et al., 2021)
b. Clothing cost savings for underprivileged families (Makanjuola et al., 2022)
c. Sustainability awareness among exhibition visitors (Refki et al., 2020)
d. Donor behavior shifts toward sustainable lifestyles (Lu et al., 2022)

Medium-Term Outcomes:

a. Growth of microenterprises based on upcycled products (Rong et al., 2021)
b. Greater involvement of business partners in shared value models (Taskin et al., 2023)
c. Local government support for community waste reduction initiatives (Lee & Jung, 2025)
d. Reduced water usage and carbon emissions from decreased textile production (Bailey et al., 2022)

Long-Term Impacts:

a. Strengthening of circular economy based on local culture (Prameswari et al., 2024; Hayes, 2019)
b. Integration into urban waste management policy (Ashton et al., 2024)
c. Expanded social and economic impact through cross-sector CSV collaboration (Rong et al., 2021; Kwon et al., 2023)

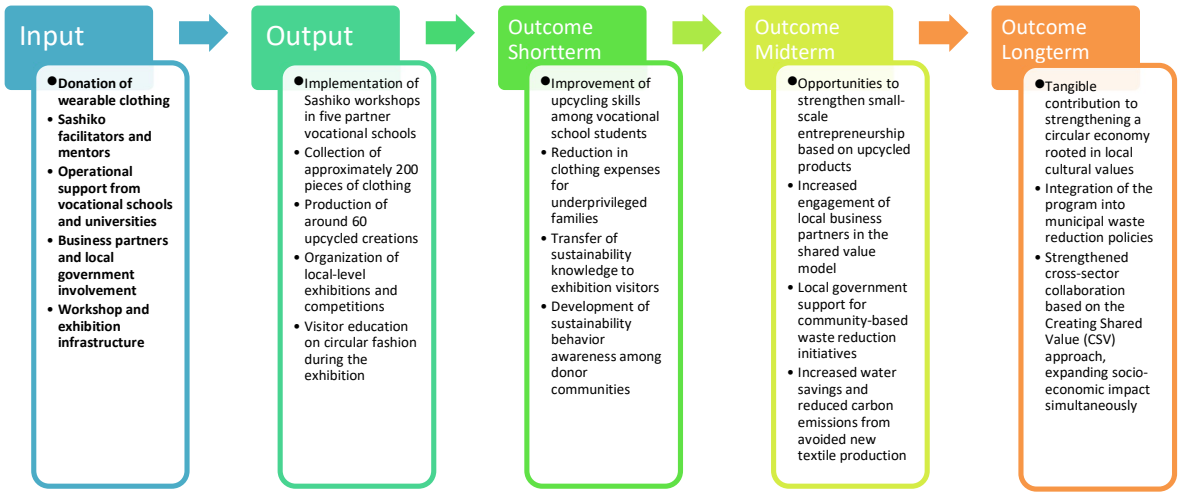

Figure 2. Visualization of the Theory of Change of the Wastra Bumi Program

Integration of Multi-Level Outcomes

The Theory of Change mapping for the Wastra Bumi Program illustrates how a simple social intervention based on textile waste processing can generate a layered value chain of transformation from individual empowerment, strengthened social networks, and enhanced local economic capabilities, to tangible contributions toward the Sustainable Development Goals (SDGs 4, 8, 12, 13, and 17) (Garcia-Ortega et al., 2023; Stringer et al., 2020).

As also highlighted by Gómez-Zapata & del Barrio-Tellado (2023), strengthening impact measurement through SROI enables the quantification of non-financial changes into monetary parameters. This clarifies the rationale for social investment and enhances data-driven policy justification.

Table 1: Stakeholder and the Role

No.	Stakeholder	Roles	Number
1	Underprivileged Communities	- Beneficiaries of upcycled clothing - Apply repair & reuse techniques - Increase income potential through upcycled products	2
2	Vocational School Students	- Participate in basic Sashiko training - Use sewing skills for entrepreneurship - Join exhibition & competition - Act as sustainability agents	240
3	Partner Vocational Schools	- Provide facilities and time for workshops - Integrate training into vocational curriculum - Promote environmental literacy	4
4	Clothing Donors	- Donate reusable clothing - Reduce fast fashion consumption - Internalize sustainable consumption values	200
5	Environment	- Benefit from reduced textile waste - Decrease landfill burden and CO_2 emissions - Save water in new textile production	1

6	City Government (DLH, Dinkop, etc.)	- Facilitate community-based waste reduction policies - Support SMK training integration - Enable cross-sector collaboration	3
7	Business Partners (SMEs, Fashion)	- Enable downstream distribution of upcycled products - Build shared value partnerships - Support ethical local fashion branding	3
8	Training Facilitators	- Instruct Sashiko skills - Lead workshops and exhibitions - Provide technical guidance in production	2
9	Organizing Committee	- Manage planning, logistics, and coordination - Draft accountability reports - Connect all stakeholders	40
10	Universitas Airlangga Surabaya	- Provide academic oversight - Offer transdisciplinary collaboration platform - Support CSV based program branding	1
11	Faculty of Economics and Business	- Facilitate experiential learning - Disseminate students' social innovation activities	1
12	Master of Management Program	- Align program with academic competencies - Validate CSV-based activities	1
13	Faculty Advisors	- Provide academic supervision - Guide planning and implementation - Ensure quality and impact assessment	4
14	FEB Unair Students	- Act as initiators, facilitators, and implementers - Integrate management theory with CSV-based social action	45
15	Sponsors	- Contribute funds, goods, or services - Ensure sustainability of the program and exhibition logistics	12
16	Media Partners	- Promote and document the program - Raise public awareness about textile waste and sustainability	60
17	Event Vendors	- Provide technical needs and documentation - Support event flow and presentation quality	3
18	Logistics/Expedition Companies	- Support distribution of donations and products - Enhance efficiency in clothing and product delivery	2
19	Guest Speakers	- Share insights on Sashiko, circular economy, and social entrepreneurship - Lead educational sessions	5
20	Raka Raki East Java Ambassadors	- Participate as MCs and influencers - Raise youth awareness of circular fashion, waste reduction, and sustainability	1

Table 2: Influence–Interest Matrix of Stakeholders in the Wastra Bumi Sashiko Program

Factor	Low Influence	High Influence
High Interest	- Clothing Donors - Underprivileged Communities	-City Government (Environmental Agency, Department of Industry and Trade, Education Department) -Vocational School Students -Business Partners (MSMEs, E-commerce, Local Fashion) -Training Facilitators - Organizing Committee -Faculty of Economics and Business Students, Airlangga University
Low Interest	- Environment (indirect ecological benefits) - Event Vendors - Delivery Service Companies	-Airlangga University -Faculty of Economics and Business, Airlangga University -Master of Management Program, FEB Unair -FEB Lecturers - Sponsors -Media Partners -Guest Speakers -Raka Raki East Java Community

Table 3: Mapping Outcome

No	Stakeholder	Input	Activities	Output	Outcome
1	Underprivileged Communities	- Damaged or reusable clothes - Community participation - Time and commitment	- Sashiko and upcycling workshops - Donating damaged clothes - Reflection and sharing sessions	-Improved sewing skills -Upcycled products created - Repaired clothes available	- Expense reduction - Increased social participation - Economic potential from upcycling
2	Vocational School Students	- Sashiko curriculum - School support	- Sashiko technique training - Creative production - Innovation competitions	- Creative products - Work documentation - Participation certificates	- Improved employability - Awareness of circular fashion - Small business potential
3	Clothing Donors	- Used clothes - Sustainability awareness - Drop point access	- Donating clothes - Public education campaigns	- 200 clothing items collected - Donation activities well-executed	- Increased ethical consumption - Personal awareness of fashion waste
4	Environment (Indirect)	- Waste reduction - Lower new production	- Waste processed into upcycled products	- Reduced waste volume - Water and energy savings	- Improved environmental quality - Contribution to SDGs 12 & 13
5	City	- Regulations	- Training	- Cross-sector	- Strengthened

	Government	and facilitation - Facility support	permits - Integration with vocational school curriculum - Multisector coordination	collaboration - Legalized activities	circular economy governance - Replication potential
6	Business Partners (MSMEs, Digital)	- Distribution channels - Digital platforms - Marketing networks	- Upcycled product distribution - Branding and design feedback	- Ethical fashion products in the market - Promotion underway	- Expanding market segment - Simultaneous profit and social impact
7	Volunteers & Facilitators	- Sashiko modules - Trained facilitators - Time commitment	- Participant training - Production mentoring - Activity evaluation	- Modules applied - Documentation available	- Intergenerational skill transfer - Enhanced community capacity
8	Organizing Committee	- Coordination team - Time and logistics - SOPs	- Managing events - Stakeholder coordination - Report writing	- Events well-conducted - Activity and financial reports available	- Increased transparency and accountability - Smooth program execution
9	Airlangga University	- Academic authority - Inter-faculty collaboration networks	- Providing academic legitimacy - Collaborative platforms	- Multidisciplinary collaboration - Activities under institutional umbrella	- Enhanced academic reputation - Integration of science and social action
10	Faculty of Economics & Business	- Experiential learning curriculum and facilities	- Embedding project in learning - Hosting result presentations	- Scientific dissemination - Best practice documentation	- Applied learning - Contribution to economic-based social innovation
11	Master of Management Program	- CSV curriculum support - Academic validation	- Program academic planning - CSV implementation supervision	- Alignment with postgraduate learning - Standards-based evaluation	- Improved curriculum quality - Integration of theory and practice
12	FEB Lecturers	- Expertise and academic supervision	- Supervision and validation of outputs	- Structured academic guidance - Quality assurance	- Maintained program quality - Knowledge transfer and project

					enhancement
13	FEB Students	- Initiative and time - Management and communicatio n skills	- Program design - Field implementation	- CSV-based social projects - Stakeholder collaboration	- Enhanced leadership capacity - Concrete integration of theory and action
14	Sponsors	- Financial, material, or service contributions	- Providing operational and logistical support	- Smooth execution - Sponsor branding disseminated	- Program sustainability supported - Sponsor reputation improved via CSR
15	Media Partners	- Media channel access - Publication support	- Publishing activities - Covering program impact stories	- News and educational content widely spread - Multi-platform publication	- Increased public awareness - Broader external support
16	Event Vendors	- Technical equipment - Event support workforce	- Providing stage, documentation, sound system, and booths	- Successful exhibitions and competitions	- Event comfort and professionalism maintained
17	Expedition Services	- Logistics and distribution services	- Transporting donated clothes and upcycled products	- On-time and efficient delivery	- Efficient logistics - Broader program reach
18	Guest Speakers	- Expert insight and experience	- Delivering educational material on Sashiko, circular economy, entrepreneurshi p	- Expert-led education sessions - Available recordings and documentation	- Knowledge transfer to participants - Inspiration for younger generations
19	Raka-Raki Youth Community	- Youth representation - Platform for promoting culture and sustainability	- Serving as MCs, influencers, and campaign ambassadors	- Social media content widely spread - Engaging public education	- Circular fashion embraced by youth - Sustainability becomes a modern lifestyle
20	National Fashion Industry Platform	- Access to industry networks - Credibility in sustainable fashion	- Global circular fashion branding & advocacy collaboration	- Program gains international recognition - Expanded collaboration opportunities	- Expanded professional networks - Enhanced international reputation

Table 4. Community Indicators of the Wastra Bumi Sashiko Program

No	Stakeholder	Outcome	Indicator	Measurement Method
1	Underprivileged Communities	- Improved welfare - Reduced consumption expenses	- Number of upcycled clothes reused - Clothing expenses per household	- Household expenditure survey - Product usage documentation
2	Vocational School Students	- Enhanced vocational skills - New entrepreneurial/employment opportunities	- Number of trainees - Number of upcycled works - Exhibition/competition participation	- Training & product data - Event attendance & documentation
3	Clothing Donors	- Participation in waste reduction - Sustainable fashion behavior	- Number of active donors - Number of clothes donated	- Drop point logistics data - Donation recaps
4	Environment (Indirect)	- Reduction of textile waste - Savings in emissions and water	- Volume of processed textile waste - Estimated emissions & water saved	- Processing reports - Life Cycle Assessment (LCA) estimates
5	City Government	- Strengthened local circular economy governance	- Number of inter-departmental collaborations - New regulations/MoUs	- Policy documents - Multisector forum minutes
6	Business Partners (MSMEs, Digital)	- Ethical fashion products in the market - Increased partner income	- Number of involved MSMEs - Number of products sold - Total sales/export value	- Transaction reports - Digital platform data
7	Volunteers & Facilitators	- Improved community educational capacity	- Number of trained volunteers - Number of training hours	- Training logs - Attendance & facilitator reports
8	Organizing Committee	- Smooth program operation	- Number of timely-conducted activities - Completeness of reporting documents	- Activity reports - Attendance list, logistics, accountability reports
9	Airlangga University	- Improved campus reputation & social contribution	- Number of inter-faculty collaborations - Number of Unair-	- Assignment letters, internal MoUs

			backed activities	- Institutional publications
10	FEB Airlangga University	- Academic dissemination of social innovation	- Number of documented outcomes - Number of internal faculty publications	- Dissemination reports - Faculty website & publications
11	Master of Management Program	- Relevance of learning to CSV practices	- Number of curriculum integrations - Number of student CSV projects	- Course syllabus & thesis documents - Academic evaluations
12	FEB Lecturers	- Knowledge transfer to society	- Number of supervisions - Quality of student proposals & reports	- Supervision logs - Evaluation rubrics
13	FEB Students	- Improved social and managerial competence	- Number of initiated activities - Number of engaged stakeholders	- Student reports - Community feedback surveys
14	Sponsors	- Positive image as social program supporters	- Number of sponsors - Media exposure of sponsor logo/name	- Social media/event documentation - Sponsor contribution reports
15	Media Partners	- Increased public awareness	- Number of media coverage - Campaign impressions/reach	- Media tracking and viewer analytics - Publication reports
16	Event Vendors	- Improved vendor reputation	- Number of facilitated activities - Quality of technical documentation & display	- Event evaluation forms - Technical reports and participant feedback
17	Delivery Services	- Efficient donation/product distribution	- Delivery time - Number of packages delivered	- Delivery receipts - Distribution accuracy evaluations
18	Guest Speakers	- Dissemination of circular economy and entrepreneurship values	- Number of educational sessions - Participants reporting	- Participant evaluations - Testimonials

			benefit from sessions	and session documentation
19	Raka-Raki East Java Youth Community	- Creative youth education	- Number of educational content created - Social media campaign reach	- Campaign insights - Social media engagement
20	National /International Fashion Industry Platforms	- Branding support and expansion of circular fashion	- Number of cross-national collaborations - Coverage or endorsements received	- International MoUs - Global fashion sustainability media coverage

Table 5. Social Outcome Indicators, Financial Proxies, and Monetization Calculation of the Wastra Bumi Sashiko Program

No	**Outcome / Impact**	**Indicator / Measurement**	**Financial Proxy**	**Deadweight, Attribution, Drop-off (Adjusted)**	**Total Monetized Value (IDR)**
1	Savings from Not Buying New Clothes	10 beneficiary households	IDR 1,700,000 per household × 90%	(1,2)	13,081,500
2	Improved Vocational Skills for Vocational Students	19,200 training hours (240 students × 80 hours)	IDR 15,000/hour (tailor wage) × 90%	(1)	220,320,000
3	Reduction in Donated Textile Waste	50 kg textile waste diverted from landfill	IDR 500/kg	(1)	21,375
4	Reduction in Factory Textile Waste (Vido Garmen)	500 kg/month × 12 months	IDR 500/kg	(1)	2,160,000
5	Water Savings from Avoiding New Production	540,000 liters saved (2,700 liters × 200 items)	IDR 0.50/liter	(1)	196,223
6	Pride & Happiness (Social Participation)	300 participants in exhibitions/workshops/competitions	IDR 250,000 × 80%	(1,2)	29,241,000
7	Integration of Vocational Curriculum in SMK	1 new curriculum implemented	IDR 1,000,000 × 90%	(1)	900,000
8	Sustainable Donation Participation	5 active participants	IDR 1,900,000/person/year × 90%	(1,2,3)	6,520,563
9	Local Circular	1 policy forum	IDR 35,000,000/	(1,2,3)	23,625,000

	Economy Governance	(documentation)	policy initiation × 90%		
10	Development of Ethical Fashion Market	15 products sold (receipts)	Product-specific prices × 90%		3,240,000
11	Skill Transfer by Facilitators	4 training sessions (payment receipts)	IDR 350,000/session		1,190,000
12	Effective Coordination by Organizing Committee	10 coordination meetings (receipts)	IDR 300,000/ meeting × 90%		2,280,000
13	Collaborative CSV Academic Platform	1 interdisciplinary program	IDR 30,000,000 × 90%	(1,2,3)	19,237,500
14	Follow-up Student Social Project	1 post-CSV project (invoice)	IDR 4,560,000/ project		2,790,720
15	Intellectual Property Registration	1 document	IDR 2,000,000	(1,2)	1,800,000
16	Campus Facility (Auditorium and Parking)	Usage permission documents	IDR 2,500,000	(1)	1,750,000
17	Community Social Media Innovation	1 social media prototype idea	IDR 3,000,000	(1)	2,180,250
18	Logistics & Workshop Exhibition Items	60 logistic items (documentation & receipts)	IDR 50,000/item		2,400,000
19	Publicity & Awareness by Media Partners	56 published media contents (documentation & receipts)	IDR 14,300,000		7,207,200
20	Comfort & Service by Event Vendors	MC, Band, Properties (receipts)	IDR 5,886,000		4,708,800
21	Logistics Efficiency by Courier Service	20 distributed packages (receipts)	IDR 50,000/package		750,000
	TOTAL				**345,600,130**

***Underlying Assumptions:** The average household size in Indonesia is approximately 3.8 persons per family (source: ArcGIS Online). The average annual clothing need per person may vary, but conservatively it is assumed that:Each individual requires a minimum of 4–6 pieces of daily wear clothing per year. Therefore, a family typically requires approximately 15–20 garments per year.

Calculation: If 200 clothing items are available, and each family requires around 15–20 items per year, then: 200 ÷ 20 = ten families can be served.

****Estimated Total Clothing Weight:** Assuming one piece of clothing weighs approximately 0.25 kg, then: 200 pieces × 0.25 kg = 50 kg Thus, 200 clothing items are equivalent to approximately 50 kilograms of textile waste.

All financial proxy assumptions were simulated using conservative values based on the realistic scale of community-based programs typically adopted in SROI studies across Asia (referencing approaches by Ashton et al., 2024; Gómez-Zapata & del Barrio-Tellado, 2023; Vluggen et al., 2020).

Table 6: Annual Social Benefit by Stakeholder Group

Stakeholders	Annual Social Benefit (IDR)	Share of Total Benefit (%)
Underprivileged Communities, Vocational School Students, Donors, Volunteers	IDR 273,871,863	79.2%
City Government, Universities, Business Partners, Environment	IDR 71,728,268	20.8%
Total Annual Social Benefit	**IDR 345,600,130**	**100%**

Table 7: SROI Financial Summary

Component	Value
Net Present Value (1 year)	IDR 345,600,130
Total Program Investment	IDR 48,036,944
Cost-Benefit Analysis (SROI Ratio, 1 year)	6.29:1
Payback Period	2 months
SROI Rate (3 years)	16.62

For every IDR 1 invested in the Wastra Bumi Community Development Program on Textile Waste Processing using the Sashiko technique: *"From Waste to Wear"*, a total social benefit of IDR 16.62 is generated. The majority of these social benefits are concentrated in skill enhancement, economic savings for underprivileged families, capacity building of vocational schools (SMKs), and textile waste reduction. This calculation generally refers to the framework applied in community waste bank models from prior studies but has been adapted to the unique characteristics of the Wastra Bumi program.

The conservative SROI value (6.29) is still classified as a "strong social impact" category according to community-based SROI literature (Vluggen et al., 2020; Ashton et al., 2024; Gómez-Zapata & del Barrio-Tellado, 2023).

Data Analysis and Validity

The validity of the measurement results in the Wastra Bumi program is reinforced through a triangulation approach that combines field observations, activity documentation, and pre–post program questionnaires. One of the primary instruments used was a Likert scale questionnaire to assess changes in participants' perceptions and intentions before and after the intervention.

During the pre-test stage, from a total of 108 respondents, the majority showed high interest in learning to create creative products from fabric waste. Specifically, 47.2% gave the highest rating (score 5), while 32.4% were at score 4. The pre-test results indicate that 47.2% of respondents selected the highest score (5), while 32.4% selected score 4.

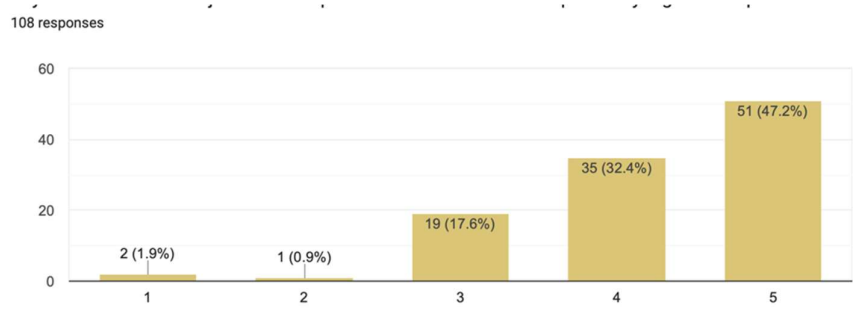

Figure 3. Pre-Test Results on Participant Intentions

Following the intervention, post-test data from 73 respondents demonstrated a concrete increase in behavioral intention. A total of 46.6% of participants expressed a strong intention to develop business ideas based on upcycled fabric (score 5), while an additional 31.5% indicated a high level of willingness (score 4). The concentration of high-category scores in the post-program phase indicates the positive impact of the Sashiko technique training and the strengthened circular fashion literacy provided through the program.

The observed shift in score distribution from the pre-test to the post-test supports a transition from mere interest in recycled products toward productive economic intention. This aligns with the principles of Outcome-Based Evaluation in Social Return on Investment (SROI) methodology, where changes in intention and behavior serve as early proxies for sustainable social value (Social Value International, 2023; Lee & Jung, 2025).

The validity of the data is further reinforced by consistent triangulation across:

a. Observed increase in the number of participant-produced works;

b. Active student involvement in competitions and exhibitions;

c. Documented training portfolios.

Accordingly, the quantitative findings from the questionnaire provide a credible foundation for identifying outcome indicators (theory of change) and substantiate the monetization of social value within the SROI framework of the Wastra Bumi Program. The distribution of responses shows a concentration in the upper scale (scores 4 and 5), indicating low variance and high agreement among participants.

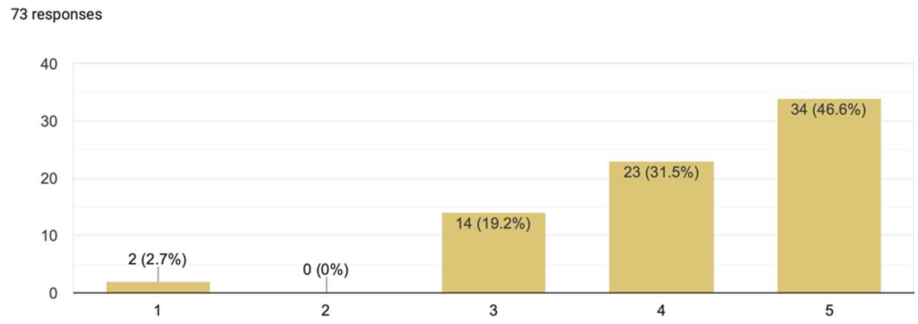

Figure 4. Post-Test Results on Entrepreneurial Motivation

Discussion

This study demonstrates that the Wastra Bumi x Sashiko Program effectively operationalizes the Creating Shared Value (CSV) framework by integrating social, economic, and environmental value within a community-based textile waste management system. The SROI analysis indicates that each IDR 1 invested generates IDR 16.62 in social value, positioning the program within the "strong social impact" category as identified in prior SROI literature (Vluggen et al., 2020; Ashton et al., 2024; Gómez-Zapata & del Barrio-Tellado, 2023). Compared to previous SROI applications, which often report ratios ranging between 2.37 and 7.08 in community-based or social service interventions (Makanjuola et al., 2022), the relatively higher ratio observed in this study suggests a particularly efficient value-generation mechanism.

Substantively, the program's outcomes are structured across three interrelated pillars. First, the enhancement of vocational skills among 240 students, equivalent to 19,200 training hours, reflects a substantial accumulation of human capital aligned with employability and entrepreneurial readiness. Second, economic savings among underprivileged households indicate the program's capacity to directly alleviate consumption burdens while promoting sustainable consumption practices. Third, the diversion of approximately 550 kg of textile waste demonstrates a measurable environmental contribution, reinforcing the circular economy logic by reducing landfill dependency and mitigating carbon emissions. These findings highlight the multidimensional impact structure typical of CSV-based interventions, where value creation occurs simultaneously across multiple domains rather than in isolation.

A critical factor underlying this outcome is the program's multi-stakeholder configuration, involving 20 stakeholder groups across institutional, community, and market domains. This configuration aligns with co-creation and ecosystem-based perspectives in circular economy literature, where value is jointly produced through interaction among actors rather than delivered unilaterally (Rong et al., 2021; Kwon et al., 2023). The structured stakeholder mapping and theory of change framework enable the identification of value flows and interdependencies, which are essential for explaining how relatively small-scale interventions can generate disproportionately large social returns.

The behavioral dimension of impact is also evident from the pre–post evaluation results. The shift from high baseline interest to a strong entrepreneurial intention (46.6% at the highest scale) reflects a transition from awareness to action-oriented motivation. Within the SROI framework, such behavioral changes function as early-stage proxies for long-term social value (Social Value International, 2023; Lee & Jung, 2025). This transition is particularly significant because it indicates that the intervention does not merely transfer skills but also reshapes participants' economic orientation toward opportunity recognition in the circular economy sector.

The relatively high SROI value can be theoretically explained through three reinforcing mechanisms. First, the program operates with a low-cost structure (IDR 48 million), which amplifies the benefit-to-cost ratio when outcomes are monetized. Second, the extensive involvement of volunteers and participants reduces labor costs while simultaneously increasing social embeddedness, thereby enhancing both efficiency and impact depth. Third, the utilization of existing institutional infrastructure, such as university facilities and vocational school networks, minimizes capital expenditure and enables rapid scalability. These factors collectively create a leverage effect, where resource efficiency and stakeholder participation interact to produce high social returns.

Despite these strengths, several limitations must be acknowledged. The SROI methodology inherently relies on financial proxies and assumptions, including deadweight, attribution, and drop-off, which introduce a degree of subjectivity in valuation (Gómez-Zapata &

del Barrio-Tellado, 2023). Consequently, the reported SROI ratio should be interpreted as an indicative measure rather than an absolute representation of social value. Additionally, the program was initially designed through a university-led (semi top-down) approach, which may constrain the extent of community-driven innovation and ownership. While participatory elements were incorporated during implementation, future initiatives would benefit from a more fully bottom-up design to enhance long-term sustainability and local adaptation.

From a broader perspective, the integration of cultural practices such as Sashiko plays a critical role beyond technical skill transfer. Cultural embedding enhances participant engagement by linking sustainability practices with identity and meaning, which is often overlooked in conventional development interventions. This aligns with emerging perspectives in social innovation that emphasize the importance of culturally grounded approaches in strengthening behavioral change and community resilience. However, the high SROI value should be interpreted with caution, as it is influenced by conservative proxy selection and context-specific assumptions that may limit generalizability across different settings.

Overall, the findings suggest that community-based circular economy interventions that combine cultural relevance, multi-stakeholder collaboration, and resource efficiency can generate substantial and scalable social value. The Wastra Bumi model thus provides a replicable framework for integrating CSV and SROI approaches in addressing complex sustainability challenges, particularly in emerging economies.

Conclusion

This study confirms that the Wastra Bumi x Sashiko Program generates measurable socio-economic and environmental benefits through a Social Return on Investment (SROI) framework. The findings demonstrate that every unit of investment produces substantial returns in the form of enhanced vocational skills, economic savings for underprivileged households, and a reduction of textile waste. Empirically, the program achieved a high SROI ratio of 16.62:1, highlighting its effectiveness as a community-based innovation model rooted in the principles of circular economy and Creating Shared Value (CSV). Theoretically, the research extends the application of SROI by integrating cultural heritage practices, such as sashiko embroidery, into sustainable development analysis, an area rarely explored in prior literature.

Economically, the outcomes reveal significant efficiency in resource use and demonstrate how community empowerment initiatives can reduce dependency on new production while stimulating local creative industries. The integration of vocational education, sustainable consumption practices, and multi-stakeholder collaboration provides a replicable model for policy makers, especially within emerging economies seeking to align with the Sustainable Development Goals (SDGs).

Nevertheless, this study has limitations, including the relatively small-scale sample of beneficiaries and reliance on conservative financial proxies. These constraints may influence the generalizability of results, though they also reinforce the conservative validity of the reported SROI ratio. Future research could expand the scope by including longitudinal impact assessments, cross-country comparisons, and more diverse stakeholder groups to validate scalability.

In conclusion, the Wastra Bumi initiative demonstrates that integrating social innovation, cultural heritage, and sustainability practices into local community programs can deliver significant value. Advanced researchers are encouraged to refine the SROI methodology for broader applications, while general readers and practitioners may adopt its lessons as a roadmap for building resilient and sustainable community-based economic models.

The program successfully achieved its intended objectives, including training 240 vocational students and diverting approximately 550 kg of textile waste, while generating measurable socio-economic value.

Acknowledgements

No financial support

Conflicts of Interest

No conflict of interest

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