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PERFORMANCE MEASUREMENT METRICS FOR NON-PROFIT TEXTILE ORGANIZATIONS

ПОКАЗАТЕЛИ ОЦЕНКИ ЭФФЕКТИВНОСТИ ДЛЯ НЕКОММЕРЧЕСКИХ ОРГАНИЗАЦИЙ ТЕКСТИЛЬНОЙ НАПРАВЛЕННОСТИ

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The industrious ecosystem relies heavily on non-profit textile organizations for helping sustain, social responsibility and community development. However, their performance is difficult to evaluate because of multi-dimensionality of their objectives and features of limited resource structures. An integrated performance measurement framework that integrates resource efficiency, social impact, environmental sustainability, stakeholder engagement and operational efficiency and which is both coherent and methodological structure, forms the basis of this study. The composite resource efficiency score, social capital formation index, eco sustainability performance index, stakeholder engagement dynamics score, and operational agility score were developed to score the operational realities, which are translated into composite indices as a whole. The analysis was carried out for an international textile company Textile Exchange.

The improvements obtained are tangible across all dimensions and the conclusions are corroborated in empirical analysis based on longitudinal input data. During five months the Composite Resource Efficiency Score increased from 5.10×10^{-8} ***to*** 5.87×10^{-8}***. Workforce development contributed to a 2.70 rise to a 3.26 on the Social Capital Formation Index across five quarters. Eco Sustainability Performance Index improved by 71.67 per cent, which is mainly attributed to a recycling rate of 75 per cent as compared to 70 per cent and 25 per cent reduction in*** CO_2 ***emissions. Volunteers were super happy to get all the satisfactions in 93pts and overall engagement scores went from 138.95 to 161pts. The Agility Score operatically improved from 0.931 to 0.975 and decreased in production error rates by 2%.***

Индустриальная экосистема в значительной степени опирается на некоммерческие текстильные организации, способствующие поддержанию устойчивости, социальной ответственности и развитию сообществ. Однако их эффективность сложно оценить из-за многомерности их целей и ограниченности ресурсов. В данном исследовании предложена комплексная

система измерения эффективности, которая объединяет оценку использования ресурсов, социального воздействия, экологической устойчивости, взаимодействия с заинтересованными сторонами и операционной эффективности. Разработаны композитные показатели эффективности использования ресурсов, индекс формирования социального капитала, индекс эффективности экологической устойчивости, показатель динамики взаимодействия с заинтересованными сторонами и показатель операционной гибкости, которые затем преобразуются в комплексные оценки организации в целом. Анализ данных для компании Textile Exchange показал, что за пять месяцев композитный показатель эффективности использования ресурсов увеличился с 5,10 × 10^{-8} до 5,87 × 10^{-8}. Развитие рабочей силы способствовало росту индекса формирования социального капитала с 2,70 до 3,26 за пять кварталов. Индекс эффективности экологической устойчивости улучшился на 71,67%, что в основном объясняется уровнем переработки отходов в 75% по сравнению с 70% и сокращением выбросов CO_2 на 25%. Волонтеры набрали в сумме 93 балла, а общий балл вовлеченности вырос со 138,95 до 161 балла. Показатель оперативной гибкости улучшился с 0,931 до 0,975, а уровень производственных ошибок снизился на 2%.

Keywords: non-profit organizations; textile industry sustainability; performance measurement; resource efficiency; stakeholder engagement; operational agility; social impact.

Ключевые слова: некоммерческие организации; устойчивость текстильной промышленности; измерение производительности; эффективность ресурсов; взаимодействие с заинтересованными сторонами; операционная гибкость; социальное воздействие.

Introduction

Non-profit textile companies are embedded in a multifaceted environment, which consists of social missions and market demands. These are not-for profit corporations, but where their primary goals include more than just making money, such as upholding fair labor standards and protecting the environment, and improving livelihoods for local communities, unlike their for-profit counterparts. But the way to reach these goals is not that easy. The lack of financial resources available, greater stakeholder accountability and the demand for transparency in operations, makes it essential for not-for-profit textile organizations to implement rigorous performance measurement models [1].

A major barrier for non-profit textile organizations is depending on multiple income sources such as donations, grants, and sales from socially responsible consumers. Such a varied source of funds can often be tied, however, and require a fine balance of meeting donor requirements while retaining organizational independence. And, the non-profit status tends to be accompanied by stringent reporting requirements, thus encouraging organizations to measure their success in terms beyond sheer financial measurement. In such an environment, the effectiveness of pursuing performance measurement as an end-goal rather sees it as a bureaucratic or compliance task [2].

For non-profit textile businesses metrics often must account not only for financial performance but also for social and environmental outcomes. More conventional marketing KPIs, such as revenue growth or profit margins, may not always be practical or adequate. Rather, non-profit textile operations, for example, have to rely on factors such as whether ethically made products can be sourced for raw materials; how well local community outreach efforts have fared; and the ecological impact made during the manufacturing process [3].

The movement towards ethical consumerism, to give another example, has been gaining a lot of head steam lately, and more and more people want to take their custom to organizations that share their values. Non-profit textile organization are being forced to evolve with the current trends in order to prove themselves and their commitment to ethical manufacturing methods. Growing attention from both regulators and special interest groups also puts pressure on these entities to exhibit greater transparency, accountability, fair play and honesty. Performance indicators, therefore, are the key strategic tools for steering through these challenges, enabling non-profit textile organizations to demonstrate success and address to the external expectations [4].

The textile sector is a frequent focus of criticism concerning its environmental footprint, due to production processes that require heavy use of resources and generate enormous amounts of waste. Non-profits in this area have an opportunity to be the organization that others look to, showing through their own actions that they are serious about wanting to put the environment first, implementing responsible measures to protect it from harm and show clients the way to operate in industry. This requires metrics that genuinely measure the environmental sustainability of their operations, such as reduced water consumption, enhanced energy efficiency, and greater application of the principles of the circular economy. These kinds of measures not only confirm the organization’s process but also build trust among donors, partners and society at large [5].

On top of environmental concerns, non-profit textile organizations’ missions center on social impact. A lot of these companies seek to create work that matters, especially for people who don’t otherwise have access to it. They could also conduct educational activities, skill training and community empowerment activities. The evaluation of these efforts needs to be based on tangible social impact criteria including, the number of people being trained, the economic gains to local economies, the general uplift in the quality of life of workers. By implementing straightforward and assessable indicators for social impact, NPTOs can further evidence their worth and ensure the long-term support of interested parties [6].

With the organization, The Value of a formal method for evaluating performance is that it is a culture builder. Both employees and management appreciate learning what areas are going well and what areas are in need of improvement. Transparent metrics can drive decision making, focus resources, and stimulate creative problem solving. This type of performance-oriented thinking enables an organization over the long term to remain focused on its mission, improve its performance and increase its ability to withstand further threats [7].

A number of models have developed over time in response to this complexity, each offering a different approach to quantifying organizational success in relation to mission accomplishment, use of resources, and social impact [8, 9].

Some of the initial non-profit PM conceptualizations suggested the combination of financial and non-financial measures. These models suggested that in addition to measures of client satisfaction, program outcomes and community impact should be considered to provide a more robust view of the effectiveness of organizations. These new models understand that textile organizations especially those who work as NGOs have particular challenges to confront and suggest indicators that take into account the specific mission and production reality [11]. Although these pioneering methods paved the way for performance measurement in the non-profit sector, there often was not enough for specific industries, such as textile [10, 12].

Non-profit textile organizations are an exception and, in their case, there is the need for elaborate performance measurements. Together, they are critical for proving accountability, operational optimization, and long-term societal and environmental impact. Sustainable solutions and findings by concentrating on appropriate indicators and sharpening its performance measurement systems, non-profit textile organizations can set the pace with sustainable and socially responsible production. This article endeavors to provide insight on key metrics that non-profit textile organizations can be measured by for increased effectiveness and lasting success in their mission-driven initiatives.

Methodology

The study utilizes a multidimensional, data-driven methodology, which integrates empirical measurement, advanced ratio analysis, and system dynamics modeling across five critical dimensions: resource efficiency, social impact, environmental performance, stakeholder engagement, and operational efficiency [1, 3, 4, 6, 9]

Resource efficiency was assessed through monthly tracking of production outputs, raw material inputs, energy consumption, and water usage. The following primary model was developed:

$$MER_t = \frac{Q_{out,t}}{Q_{raw,t}}, \quad (1)$$

where MER_t is the material efficiency at month t; $Q_{out,t}$ is total textile output (kg); $Q_{raw,t}$ is raw material input (kg).

To integrate energy and water considerations, a Composite Resource Efficiency Score (CRES) was formulated:

$$CRES_t = \left(\frac{Q_{out,t}}{Q_{raw,t}^{\alpha} E_t^{\beta} \times W_t^{\gamma}}\right)^{\delta}, \quad (2)$$

where $Q_{out,t}$ output (kg), $Q_{raw,t}$ input (kg), E_t energy consumption (kWh), W_t water usage (liters), and $\alpha, \beta, \gamma, \delta$ are scaling coefficients.

The evaluation of social sustainability involved quarterly data on new hires, training hours, existing workforce, and local employment rates. The Social Capital Formation Index (SCFI) was constructed as:

$$SCFI_q = \left(\frac{H_q T_q}{E_q^2}\right)\left(1 + \frac{L_q}{100}\right), \quad (3)$$

where $SCFI_q$ social impact index for quarter q; H_q new hires; T_q training hours; E_q existing employees; L_q local employment percentage.

Environmental sustainability was assessed through waste production, CO_2 emissions, and recycling rates. An Eco-Sustainability Performance Index (ESPI) was defined:

$$ESPI_q = \frac{R_q^{\eta}}{W_q^{\theta} C_q^{\zeta}}, \quad (4)$$

where $ESPI_q$ eco-performance score for quarter q; R_q recycling rate (%); W_q waste produced (kg); C_q CO_2 emissions (kg); η, θ, ζ weighting exponents.

Additionally, Energy Recovery Efficiency (EnRR) was introduced to measure energy savings:

$$EnRR_q = \frac{E_{saved,q}}{E_{baseline,q}}, \quad (5)$$

where $EnRR_q$ energy recovery rate; $E_{saved,q}$ energy saved (kWh); $E_{baseline,q}$ baseline energy without recycling (kWh).

Stakeholder engagement metrics were based on satisfaction surveys and participation rates. A Stakeholder Engagement Dynamics Score (SEDS) was developed:

$$SEDS_q = \left(\frac{D_q + V_q + C_q + P_q}{4}\right)\left(1 + \frac{I_q}{100}\right), \quad (6)$$

where $SEDS_q$ stakeholder engagement score for quarter q; D_q, V_q, C_q, P_q satisfaction ratings (%) of donors, volunteers, community, and partners; I_q participation rate (%).

Operational efficiency was monitored monthly via cycle time, fulfillment rates, and error rates. An Operational Agility Score (OAS) was formulated:

$$OAS_t = \left(\frac{O_{on,t}}{O_{tot,t}}\right)^{\mu}\left(1 - \frac{E_t}{100}\right)^{\nu}, \quad (7)$$

where OAS_t operational efficiency at month t; $O_{on,t}$ orders fulfilled on time; $O_{tot,t}$ total orders placed; E_t order error rate (%); μ, ν performance sensitivity parameters.

Results

The analysis was carried out for an international textile company Textile Exchange. The composite efficiency score assesses the effective utilization of raw materials, energy, and water relative to the quantity of textile products manufactured. Figure 1 below outlines the recorded input parameters and computed Composite Resource Efficiency Score (CRES) during each month of the analysis period.

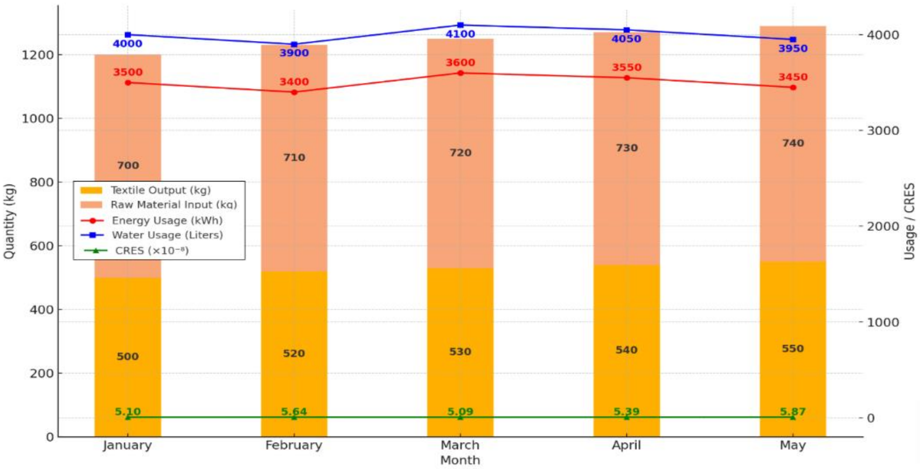

Fig.1

The textile production showed an upward trend from January to May and the scale of production was continually expanding. The degree of variation in obtaining raw materials and energy is small, but CRES has increased from 5.10×10⁻⁸ in January to 5.87×10⁻⁸ in May, mainly due to the increase of the values of with which are affected a lot. This evolution reveals improved efficiency of resource conversion which is likely related to a greater emphasis on planning and resource use optimization. The slight decline of water use and lower energy usage in the latter months also suggests additional efficiency increases, indicating successful operational changes.

Community-based industries, social impact assesses contributions to local employment, the development of the workforce by training and the stability of the employee base. These efforts are all brought together in the Social Capital Formation Index (SCFI), by which progress can be measured over time. Figure 2 presents the input variables and the SCFI results of five previous quarters.

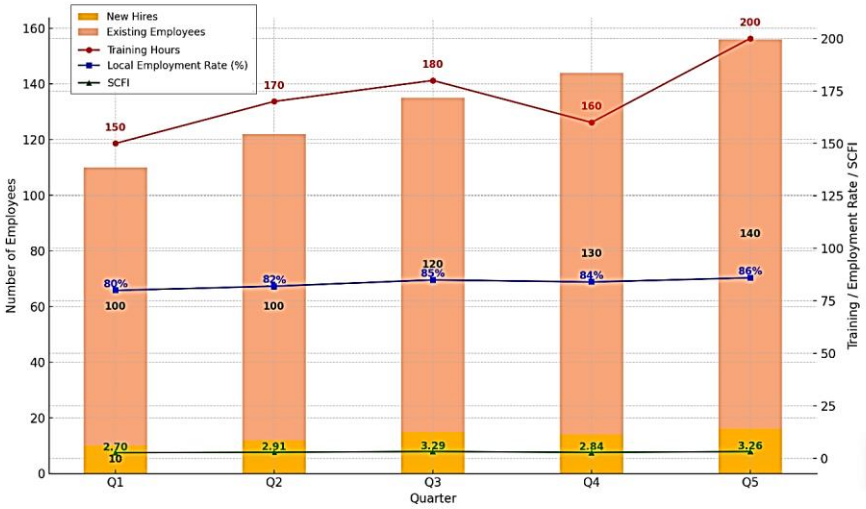

Fig.2

Over the five quarters monitored, new hires and training hours continued to increase, revealing a long-term investment in workforce capacity development. The Social Capital Formation Index (SCFI) increased from 2.70 in Q1 to 3.26 in Q5, indicating enhanced human capital development and humanitarian involvement were achieved. Small spikes, like the one in Q4, are related to temporary workforce restructuring rather than overall downward trend. The Q5 figure of 86% local employment represents an overall increase in the proportion of employment generated in the local communities.

Sustainability assesses progress in minimizing waste generation, reducing carbon emissions, and improving material recycling. The Eco-Sustainable Performance Index (ESPI) is a compendium summary of such activities. The measured operational para-meters and the corresponding calculated ESPI values are summarized in the following Figure 3.

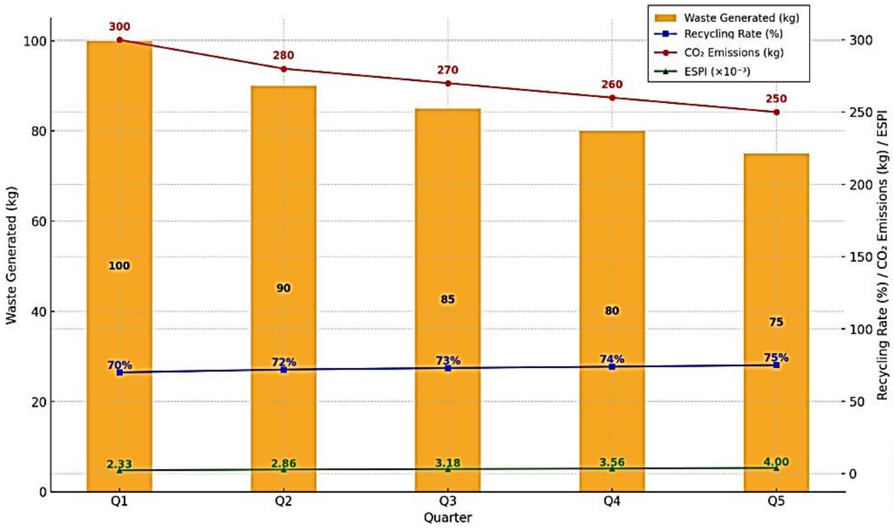

Fig.3

The data showed that ESPI exhibited an increasing trend from Q1 to Q5, indicating that the company has greater commitment toward environmental responsibility. Waste production and CO_2 emissions declined unevenly over successive periods, with a gradual increase in recycling rates. The ESPI nearly doubled over the five quarters, signaling that strategically planned waste management and carbon-reduction programs had a heightened payback. These gains are in line with global textile sector objectives to move towards low-carbon and circular production practices.

Engaging stakeholders is reflective of the satisfaction of diverse types of stakeholders in the organizations' actions. The Stakeholder Engagement Dynamics Score (SEDS) provides a quantitative overview of the quality of the engagement over time. These participation and satisfaction ratings by evaluation quarter are further presented in Figure 4.

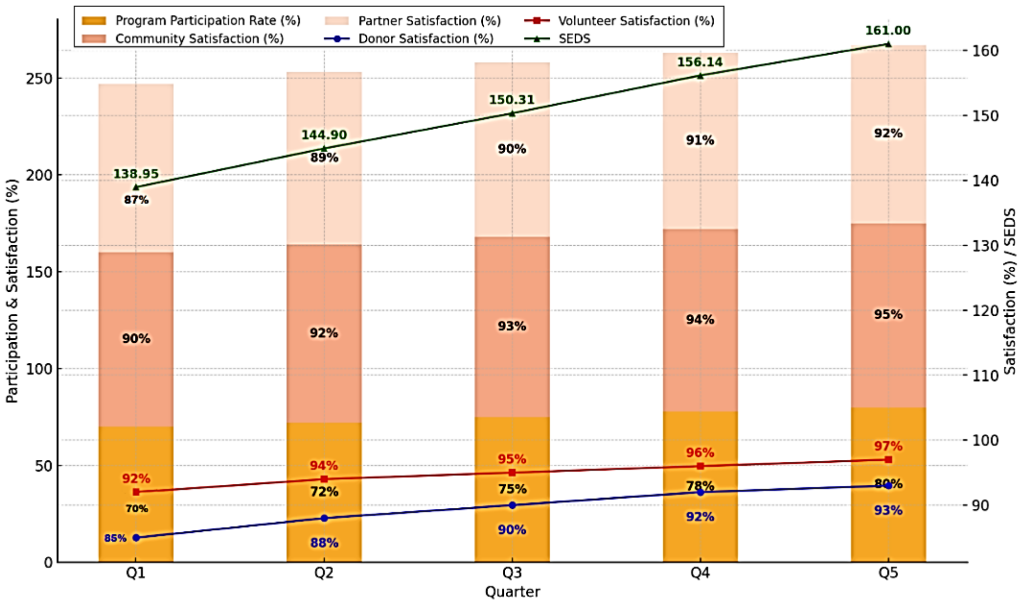

Fig.4

Satisfaction of stakeholders, among donors, volunteers, community members and partners, increased over the five quarters overall. The Stakeholder Engagement Dynamics Score (SEDS) increased month on month from 138.95 to 161, as satisfaction scores and researched participation increased. Volunteer satisfaction was 97% by Q5, which is a testimony to effective volunteer management. The fact that participation for the program has grown to 80% similarly suggests a heightened level of community ownership and confidence, that (more of) the organization's outreach implications are beginning to have traction with its flagship community stakeholders.

Operational efficiency evaluates how responsive are order deliveries and how much are the production errors being kept at a minimum. The Operational Agility Score (OAS) captures these operational results. Monthly rates of fulfillment, error, and estimated OAS values are provided in the Figure 5 below.

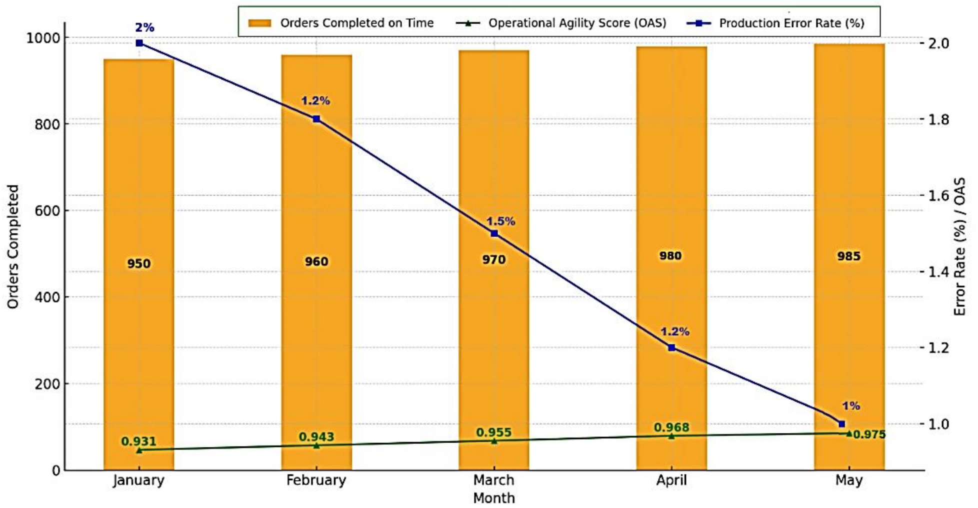

Fig.5

The information shows substantial efficiency gains in the five-month timeframe. Timely completions increased from 950 to 985 and production errors decreased from 2.0% to 1.0%. Accordingly, the Operational Agility Score (OAS) increased by 0.931 to 0.975. Better production scheduling, tighter quality control and more accurate supply chains coordination are all causes of such a trend. These improvements are not just reflected in the improved quality of service the organization provides, but also drive increased resource savings and beneficiary satisfaction points.

Discussion

The findings highlight that the importance of the use of domain-specific performance measures applicable to hybrid non-profit organizations combining operational sustainability with social and environmental performance. The resource efficiency assessment indicated improvements in material efficiency over time, expressed as an increasing material efficiency ratio. This is in contrast to previous literature [13], which tended to treat resource inputs as 'sunk costs' and did not specifically examine these outputs. This study thus contributes to a better understanding of optimal production strategies and their impact on efficiency by quantifying the interplay of raw material input and output volumes. Unlike previous work [14], where environmental considerations were separated from operational concerns, this paper shows the impact of environmental performance on operations by associating waste generation and recycling with savings and process improvement.

Measured through the Sustainability Impact Index, Social Impact increased consistently with added training hours and an increase in local hires. This contrasts with previous models which were largely based on qualitative reporting, for example through narrative reporting of community participation [15]. The method connects the delivery of mission in organizations with more structured outcomes in human development, which has been largely invisible in previous measures of non-for-profit performance.

Previous evaluations of textile-related sustainability efforts have often focused on compliance rather than performance optimization [16…18]. This article introduces a calculated Environmental Impact Ratio that effectively bridges recycling rates and emissions data, producing a singular metric that facilitates more strategic decision-making. Unlike older frameworks that treated environmental indicators as external mandates, this study positions them as central to organizational efficiency.

The clear trend in increasing engagement levels reflects deliberate organizational efforts to enhance transparency and trust. This reinforces the idea that stakeholder confidence correlates with long-term sustainability, a dimension largely absents from earlier comparative studies [19].

The operational efficiency metrics, as measured by the Order Completion Index and related indicators, illustrate a marked upward trajectory. Unlike past literature [20, 21] that examined operational metrics in isolation, this study situates them within a broader performance ecosystem. It reveals that improved logistics and lower error rates not only boost fulfillment rates but also enhance the social and environmental dimensions through reduced material waste and more effective labor deployment.

Collectively, these results not only support a multidimensional measurement model, but suggest that the understanding of what constitutes performance in mission-driven industries appears to be evolving. In contrast to classic sector approaches this takes into account the interrelationships between operational strategies and social goals [22].

With an increasing focus on the role of the non-profit textile sector in the sustainability and social justice movements, the establishment of a sound performance evaluation system is offered as an immediate and useful mechanism for self-assessment, benchmarking, and continual improvement.

Conclusion

The study suggested a muti-dimensional performance evaluation model on non-profit textile organizations, where the multiple dimensions of resource efficiency, social impact, environmental sustainability, stakeholder engagement and operational effectiveness are integrated within a single methodological framework. The methodological novelties implemented, including the working with the composite indicators as the Composite Resource Efficiency Score, Social Capital Formation Index, Eco-Sustainability Performance Index, Stakeholder Engagement Dynamics Score and Operational Agility Score, made it possible to penetrate into the inter-related actuality of organizations operations. These measures were capable of assessing performance with greater sensitivity to the dependencies from other dimensions rather than merely on a one-dimension-at-a-time basis, and hence within a more comprehensive organization.

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