



Evaluating The Operational Dynamics and Financial Accountability of Kerala's Welfare Corporations in Promoting Socio-Economic Equity among Marginalized Groups

Varghese K. ^{1*}, M. Janarthanan Pillai ²

¹ Research Scholar, Department of Management Studies, Noorul Islam Centre for Higher Education, Kumaracoil, Tamil Nadu, India

² Research Supervisor, Professor, Department of Management Studies, Rohini College of Engineering and Technology, Palkulam, Kanyakumari District

*Corresponding author E-mail: varghesek69@gmail.com

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Abstract

Marginalized groups are communities that experience persistent social, economic, and political disadvantages, often resulting in limited access to essential resources such as education, employment, healthcare, and financial stability. In Kerala, efforts to promote inclusive development have led to the implementation of a wide range of welfare schemes. Among these, three key public sector organizations—Kerala State Women's Development Corporation (KSWDC), Kerala State Handicapped Persons Welfare Corporation (KSHPWC), and Kerala State Development Corporation for Scheduled Castes and Scheduled Tribes (KSDCSCST)—have been selected for this study based on their targeted welfare initiatives aimed at empowering women, Scheduled Castes (SC), Scheduled Tribes (ST), and persons with disabilities. This research evaluates the impact of these welfare schemes on the socio-economic development of marginalized communities in Kerala using a quantitative approach. Using Multiple Linear Regression ($R^2 = 0.78$) and MANOVA, the research finds statistically significant improvements in financial independence ($M = 3.8$), job security ($M = 3.5$), educational attainment ($M = 3.9$), and quality of life ($M = 4.0$). Factor analysis identifies strategic domains such as skill development, gender empowerment, and accessibility. These results demonstrate that targeted welfare policies yield measurable and meaningful socio-economic advancements. The study underscores the need for accountability-driven, inclusive policymaking.

Keywords: Factor Analysis; Marginalized Groups; Multivariate Analysis of Variance; Multiple Linear Regression; Socio-Economic Advancement; Welfare Schemes.

1. Introduction

Socio-economic inequality continues to be a significant issue in India, particularly for marginalized groups such as women, persons with disabilities, and SC/ST communities, who have long faced systemic challenges in accessing education, employment, and opportunities for social advancement. Kerala, with its high literacy rates and progressive social policies, stands out as a leader in implementing welfare initiatives aimed at supporting these disadvantaged communities. Over the years, the state government has introduced various schemes focused on improving financial security, enhancing skill development, and elevating the overall quality of life (Vermais, N. M. P., & Srivastava, A., 2021). Kerala's approach to social development has garnered both national and international acclaim for its strong emphasis on human capital and social justice. This commitment has been reflected in the state's substantial investments in public welfare, leading to notable successes in healthcare, education, and gender equality.

Despite these advancements, marginalized communities in Kerala continue to face socio-economic hardships. Studies indicate that while government welfare programs have contributed to poverty reduction and improved living conditions, challenges such as unemployment, income disparity, and limited access to advanced healthcare persist among these groups (Preethi et al. 2022). Kerala offers a wide range of welfare schemes specifically designed to support marginalized communities, including SC, ST, fishermen, elderly individuals, women, persons with disabilities, and migrant workers. Some notable initiatives include the SC/ST development schemes that provide financial aid for education, housing, and self-employment, the Kudumbashree Mission that empowers women through self-help groups and micro-enterprises, and the Comprehensive Health Insurance Scheme (CHIS) that ensures healthcare access for economically weaker sections. Additionally, schemes like the Ashwasakiranam and Snehapoorvam offer financial support to caregivers of bedridden patients and children who have lost their parents, respectively, reflecting Kerala's holistic approach to social welfare (Roshni 2025). These programs play an important part in improving the living standards of marginalized communities by enhancing financial stability, generating employment

opportunities, and increasing access to critical services such as healthcare, housing, and education (Marson et al. 2023). The purpose of this research is to examine how welfare schemes influence the socio-economic advancement of marginalized groups in Kerala. The study aims to identify the relationship between these welfare initiatives and key socio-economic factors, including financial stability, employment opportunities, education, healthcare, and overall quality of life. By analyzing these variables, the study determines the extent to which these schemes contribute to reducing disparities and improving socio-economic conditions.

1.1. Research questions

- 1) How do the welfare schemes implemented by the welfare corporations (KSWDC, KSHPWC, and KSDCSCST) impact the socio-economic advancement of marginalized groups in Kerala?
- 2) What are the strategic priorities and policy frameworks adopted by KSWDC, KSHPWC, and KSDCSCST in their welfare initiatives?
- 3) To what extent do the policies of KSWDC, KSHPWC, and KSDCSCST influence the socio-economic development of marginalized communities in Kerala?
- 4) How effective are welfare schemes in improving financial independence, job security, educational attainment, healthcare access, and quality of life among marginalized groups?
- 5) Are there statistically significant relationships between the implementation of welfare policies and measurable socio-economic outcomes for marginalized communities in Kerala?

1.2. Research objectives

- To examine the demographic distribution of the study sample, including factors such as age, gender, educational background, income level, and social category, to understand the characteristics of the beneficiaries of these welfare schemes.
- To explore the strategic priorities and policy frameworks of the welfare corporations (KSWDC, KSHPWC, and KSDCSCST) in addressing the socio-economic needs of marginalized groups in Kerala.
- To evaluate the measurable impact of welfare schemes on the financial independence, job security, educational attainment, healthcare access, and quality of life of marginalized communities in Kerala.

1.3. Research hypothesis

H₁₁: The strategic priorities and policy frameworks of the welfare corporations (KSWDC, KSHPWC, and KSDCSCST) significantly influence the socio-economic development of marginalized groups in Kerala.

H₀₁: The strategic priorities and policy frameworks of the welfare corporations (KSWDC, KSHPWC, and KSDCSCST) do not significantly influence the socio-economic development of marginalized groups in Kerala.

H₁₂: Welfare schemes have a significant impact on financial independence, job security, educational attainment, healthcare access, and quality of life of marginalized communities in Kerala.

H₀₂: Welfare schemes do not have a significant impact on financial independence, job security, educational attainment, healthcare access, and quality of life of marginalized communities in Kerala.

2. Literature Review

Swathy and Venugopal (2024) examined the effectiveness of tribal welfare schemes in Kerala, focusing on their impact on education, healthcare, livelihoods, cultural preservation, and community participation. The study provided a comprehensive analysis of achievements and challenges, highlighting progress in access to essential services and socio-economic empowerment. However, financial constraints, bureaucratic inefficiencies, and awareness gaps remained significant obstacles. The study emphasized the inclusive approaches, gender equality, and social integration to address diverse tribal needs. Findings indicated that sustaining long-term benefits required innovative strategies and better stakeholder coordination. Limitations included inadequate healthcare facilities, restricted employment opportunities, and poor infrastructure in remote areas, underscoring the targeted interventions to enhance tribal welfare. Jose and Prasad (2024) aimed to understand the perceptions of tribal communities in Kerala regarding their socioeconomic, environmental, and welfare conditions. A primary survey was conducted in tribal-concentrated areas of Wayanad, Idukki, and Thiruvananthapuram districts, selecting 384 households using a Google sample calculator with a 5% margin of error. The findings indicated generally positive perceptions of government welfare initiatives, with minimal variation in responses. However, significant differences emerged across districts and tribal communities, emphasizing the need for tailored policies. Despite their positive outlook on existing schemes, tribal communities continued to face socioeconomic disadvantages compared to other groups. The study underscored the necessity of well-structured programs and policy interventions to address disparities and improve the overall well-being of Kerala's tribal populations.

Kumar et al. (2024) investigated the socio-economic impact of developmental schemes in the tribal areas of Himachal Pradesh. The study aimed to assess the effectiveness of various government initiatives in improving economic growth, employment, infrastructure, and social upliftment. Data was collected through surveys and interviews with tribal communities. The analysis utilized statistical methods, including mean, standard deviation, skewness, kurtosis, chi-square test, and p-value criterion. Findings indicated that while the schemes led to improved living standards, increased agricultural production, and positive social transformation, challenges remained in sectors like livestock, jewellery, and land. The study emphasized inclusive policies, better infrastructure, and targeted capacity-building programs for optimizing developmental efforts. Meng (2024) examined the role of education policy in promoting social justice for marginalized groups, analysing how UK policies either perpetuated or mitigated inequities in access and outcomes. The study employed a qualitative content analysis of key policy documents, including the Pupil Premium Reports and Education White Paper (2021–2023), alongside secondary data from OECD and UNICEF. Using a policy analysis framework, the research assessed redistributive, recognition, and participatory justice in education. Findings indicated that while funding mechanisms partially addressed redistributive justice, marginalized students in rural areas and immigrant communities faced persistent disparities. Recognition justice remained inconsistent due to underdeveloped diversity training, and participatory justice was the weakest area, with limited involvement from marginalized families. The study was limited by its dependence on secondary data, which do not fully capture policy implementation nuances.

Ochieng (2023) examined the extent of EdTech deployment in Kenya during the COVID-19 pandemic, focusing on marginalized and vulnerable populations. The study adopted a cross-sectional design and utilized both primary and secondary data. The findings revealed

that marginalized learners, particularly those affected by poverty, had limited access to EdTech-supported learning due to low household access to smartphones, tablets, computers, and internet connectivity. Despite the increased use of radio, TV, YouTube, Kenya Education Cloud, Zoom, and WhatsApp for distance learning, approximately 6.1 million learners were left behind. The study also highlighted that learners with special needs, refugees, and stateless persons were inadequately covered in government interventions. The research underscored socioeconomic disparities as a key barrier to equitable access to EdTech in Kenya. Allotey et al. (2023) explored the impact of Dialogic Literary Gatherings (DLGs) on transforming the educational experiences of marginalized students in Ghana. The study focused on children from rural and urban poor communities, ethnic and linguistic minorities, and displaced populations who have historically faced discrimination in education. An ethnographic case study was conducted with 8th-grade students in a compulsory school in Southeastern Ghana, analysing personal accounts from seven participants. The findings revealed that DLGs fostered egalitarian dialogue, allowing students to share grievances, improve peer relationships, and boost self-confidence, ultimately transforming their educational experiences. The study provided valuable insights for educators and policymakers seeking innovative strategies to support marginalized students. However, it was limited by its inability to measure DLGs' impact on academic performance due to time constraints.

Kumar (2023) examined the socio-economic and educational conditions of marginalized communities in India, particularly the Scheduled Castes, the Scheduled Tribes, and other constitutionally recognized weaker sections. The study highlighted the persistent challenges these groups faced, including poverty, lack of necessities, and limited access to education and healthcare. The research underscored the impact of economic deprivation and social discrimination on their livelihoods. The findings revealed that, despite ongoing reforms since the 1970s, a significant portion of the population still struggled with resource scarcity. However, increased awareness of rights and education contributed to gradual improvements. Ali and Shafeeq (2021) analysed the educational challenges faced by marginalized women in India, emphasizing the impact of caste and class biases on their social and economic development. The study explored challenges such as parental illiteracy, poverty, early marriages, poor school environments, and gender discrimination, which contributed to high dropout rates. It reviewed various constitutional provisions and government schemes aimed at improving women's education and empowerment. The findings highlighted that, despite numerous initiatives, marginalized women continued to struggle with limited access to education. The study underscored enhanced policy implementation to ensure equal educational opportunities. Also, the study concluded that true national progress could only be achieved by addressing these systemic educational disparities among marginalized women.

Sharma et al. (2020) evaluated a community-based intervention aimed at improving marginalized women's awareness and utilization of maternal and child health (MCH) services while enhancing access to livelihood and savings. The study was conducted in two marginalized districts of Uttar Pradesh, covering 24 villages in each of the four selected development blocks. Using a peer-led approach, peer educators facilitated knowledge transfer and created a supportive environment at the household and community levels. The intervention was assessed through a non-experimental 'post-test analysis of the project group' with a mixed-method approach, tracking 37,324 participants. Results showed increased MCH awareness, with 90% and 85% of women attending sessions in Banda and Kaushambi, respectively. Additionally, 39% and 35% registered for livelihood schemes, with most securing employment. Women also utilized savings for essential needs. However, the study's lack of a control group limited the generalizability and validity of the findings. Devi (2020) assessed the impact of governmental initiatives on tribal development, focusing on women in Rayagada and Keonjhar districts. The study aimed to evaluate the absorption, response, and effectiveness of welfare schemes targeted at tribal communities. An empirical approach was employed to analyze socio-economic conditions, indebtedness, and access to essential services. Findings revealed persistent challenges, including inadequate healthcare, education, and financial exploitation due to dependency on private money lenders. Land ownership played a crucial role in reducing financial vulnerability.

In addition to socio-economic outcomes, financial accountability played a critical role in the success of public welfare programs. As Gray et al. (1996) emphasized, accountability in the public sector must extend beyond financial reporting to include social and ethical dimensions, especially where public resources are involved. Shah (2007) emphasized that performance-based budgeting and fiscal transparency were essential for efficient resource allocation and monitoring. Allen and Tommasi (2001) further argued that public financial management systems needed to integrate audit functions and policy-based budgeting to enhance institutional accountability. These frameworks were particularly relevant for welfare corporations such as KSWDC and KSDCSCST, which managed public funds under increasing scrutiny. While prior studies largely focused on welfare outputs such as access and coverage, limited attention had been paid to how these initiatives aligned with broader institutional accountability models. To address this gap, the present study drew upon the Balanced Scorecard framework (Kaplan & Norton, 1996) to assess performance across financial, developmental, and internal process dimensions. Additionally, Bovens' (2007) theory of public accountability provided a conceptual basis to examine transparency, answerability, and governance in welfare delivery.

2.1. Research gap

Despite extensive research on the socio-economic conditions of marginalized groups, significant gaps remain in evaluating the effectiveness and sustainability of developmental schemes in Kerala. While existing studies have highlighted disparities in education, healthcare, and livelihood opportunities among tribal communities, they often lack a long-term assessment of welfare programs' impact. Additionally, research has underscored regional variations in developmental outcomes, indicating the necessity of a context-specific analysis to understand disparities in economic growth, employment opportunities, and infrastructure accessibility. Although prior literature has examined educational barriers among marginalized communities, there is limited focus on the role of digital literacy and skill development in enhancing financial independence and social mobility. Moreover, despite numerous welfare initiatives implemented by government corporations, there is insufficient empirical evidence assessing their strategic priorities, policy effectiveness, and tangible socio-economic outcomes for marginalized groups. To bridge these knowledge gaps, this study critically analyzes the impact of Kerala's welfare schemes on the socio-economic advancement of marginalized communities, focusing on policy effectiveness, strategic priorities, and developmental outcomes. By examining the implementation and outcomes of initiatives by key welfare corporations such as KSWDC, KSHPWC, and KSDCSCST, this research provides a comprehensive evaluation of their influence on financial independence, employment stability, educational attainment, and healthcare access. Furthermore, it assesses whether these welfare policies demonstrate statistically significant relationships with measurable socio-economic progress.

3. Methods

3.1. Conceptual framework

This study explores the relationship between the strategic priorities and policy frameworks of welfare corporations (KSWDC, KSHPWC, and KSDCSCST) and their influence on the socio-economic development of marginalized communities in Kerala, particularly in addressing their socio-economic needs. Also, the study evaluates the effectiveness of welfare schemes in improving financial independence, job security, educational attainment, healthcare access, and quality of life. The conceptual framework proposed is shown in Figure 1.

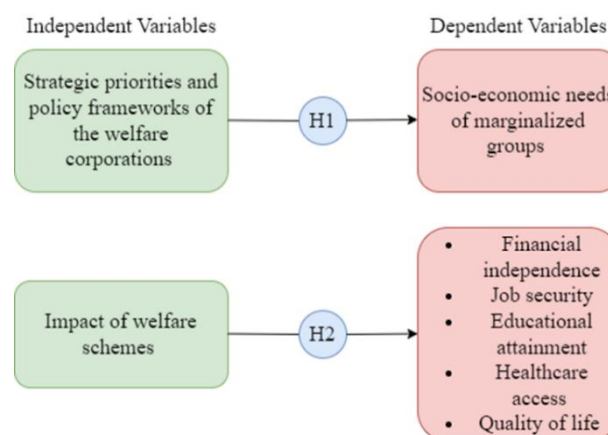


Fig. 1: Conceptual Block Diagram of the Proposed Study.

3.2. Research design

This study adopts a quantitative research design to measure the effectiveness of welfare schemes on socio-economic development. A descriptive and explanatory research approach is utilized to examine the relationships between welfare initiatives and key socio-economic indicators. The study follows a cross-sectional survey method, where data is collected to analyze the current impact of the welfare programs. The structured design ensures that findings are robust, reliable, and generalizable to similar socio-economic settings.

3.3. Population and sample

The population of this study consists of beneficiaries of welfare schemes implemented by KSWDC, KSHPWC, and KSDCSCST across Kerala. These beneficiaries include individuals from Scheduled Castes (SC), Scheduled Tribes (ST), Other Backward Classes (OBC), women, and persons with disabilities who have received financial aid, employment assistance, education support, health services, and social empowerment benefits through various welfare programs. To determine the appropriate sample size, Yamane's formula is used, which is a widely accepted method. Yamane's formula is given in (1).

$$n = \frac{N}{1 + N(e^2)} \quad (1)$$

where n is the required sample size, N is the total estimated population benefiting from welfare schemes and e is the margin of error (0.05 for a 95% confidence level). The study determines the appropriate sample size based on an estimated total of 9,500 marginalized individuals benefiting from these schemes.

$$n = \frac{9500}{1 + 9500(0.0025)}$$

$$n = \frac{9500}{1 + 23.75}$$

$$n = \frac{9500}{24.75}$$

$$n \approx 384$$

Thus, the appropriate sample size for a population of 9,500 with a 5% margin of error was initially calculated as 384 respondents. However, after data collection, only 375 complete and valid responses were obtained, as some responses were incomplete or inconsistent, making them unsuitable for analysis. To maintain the integrity of the study, a stratified random sampling technique was employed, ensuring proportional representation across all social categories and welfare corporations. Despite the slight reduction in sample size, the final dataset remains statistically robust, allowing for meaningful comparisons across different welfare programs and providing a comprehensive understanding of their impact on marginalized communities in Kerala.

3.4. Data collection

Data for this study were collected using a structured questionnaire designed to capture both demographic details and key socio-economic outcomes. The questionnaire included closed-ended questions to measure the effectiveness of welfare schemes using a five-point Likert scale, assessing respondents' perceptions of financial stability, employment opportunities, education, health, and quality of life. Primary

data were collected through both face-to-face interviews and online surveys to ensure inclusivity and accessibility for all respondents. However, recognizing potential digital literacy and accessibility challenges among marginalized groups, additional measures were taken to address these concerns. Respondents with limited digital access or literacy were given the option to participate through in-person interviews conducted at community centers, local government offices, and other accessible locations within tribal settlements. In cases where respondents were unable to travel, home visits were arranged to facilitate their participation.

To support online participation, field researchers provided step-by-step guidance to respondents unfamiliar with digital platforms. This included assisting with survey navigation, clarifying questions, and, when necessary, using intermediaries such as local community leaders or social workers to help respondents complete the online questionnaire. Efforts were made to ensure that assistance was provided in a non-intrusive manner, preserving respondents' autonomy in answering survey questions. Secondary data were gathered from government reports, policy documents, and previous studies on welfare interventions. Ethical considerations, such as obtaining informed consent, ensuring voluntary participation, and maintaining confidentiality, were strictly followed throughout the data collection process to protect respondents' rights and privacy.

3.5. Data analysis

The collected data is analyzed using both descriptive and inferential statistical techniques. Descriptive statistics summarize demographic characteristics and respondents' experiences with welfare schemes. Factor analysis is performed to group welfare schemes into distinct categories based on their primary objectives, such as skill development, social empowerment, and financial support. Multiple Linear Regression (MLR) assesses the relationship between welfare schemes and socio-economic factors, measuring their impact. Multivariate Analysis of Variance (MANOVA) evaluates differences in socio-economic indicators among beneficiaries. R^2 , F-statistic, Wilks' Lambda, and partial η^2 values determine the explanatory power of the models. Statistical analyses are conducted using SPSS version 27 for data computation and visualization.

4. Results

4.1. Demographic distribution

Demographic distribution refers to the statistical breakdown of a study's population based on characteristics such as age, gender, education, income, and social background. Table 1 and Figure 2 show the demographic distribution that helps to analyze the characteristics of marginalized groups benefiting from welfare schemes, providing insights into their socio-economic conditions.

Table 1: Demographic Distribution

Variable	Category	Frequency (N=375)	Percentage
Gender	Male	183	48.8%
	Female	192	51.2%
Age Group	18–35 years	137	36.5%
	36–50 years	129	34.4%
	Above 50 years	109	29.1%
	Primary Education	118	31.5%
Educational Qualification	Secondary Education	153	40.8%
	Graduate & above	104	27.7%
	Below ₹10,000	162	43.2%
Income Level (Monthly)	₹10,000 - ₹20,000	138	36.8%
	Above ₹20,000	75	20.0%
	Scheduled Caste (SC)	132	35.2%
Social Category	Scheduled Tribe (ST)	98	26.1%
	Other Backward Classes (OBC)	145	38.7%
	Unemployed	96	25.6%
Employment Status	Self-employed	103	27.5%
	Salaried (Private/Govt.)	97	25.9%
	Daily Wage Worker	79	21.1%
Beneficiary of Welfare Schemes	KSWDC	142	37.9%
	KSHPMC	115	30.7%
	KSDCSCST	118	31.4%
Disability Status	Yes	83	22.1%
	No	292	77.9%
Access to Financial Support	Yes	228	60.8%
	No	147	39.2%

The demographic distribution of the 375 respondents reveals a nearly equal gender representation, with 51.2% female and 48.8% male participants. The majority (36.5%) fall within the 18–35 age group, followed by 34.4% in the 36–50 age bracket, and 29.1% above 50 years. Educational qualifications indicate that 40.8% have completed secondary education, 31.5% primary education, and 27.7% are graduates or higher. A significant portion (43.2%) earns below ₹10,000 per month, highlighting economic vulnerability. Socially, Scheduled Castes (SC) form 35.2%, Scheduled Tribes (ST) 26.1%, and Other Backward Classes (OBC) 38.7%. Employment data show that 25.6% are unemployed, while 27.5% are self-employed. Beneficiaries of welfare schemes are distributed among KSWDC (37.9%), KSHPMC (30.7%), and KSDCSCST (31.4%). Notably, 22.1% of respondents have disabilities. Financial support access is relatively high, with 60.8% receiving assistance. Overall, the data underscores the socio-economic challenges among marginalized groups in Kerala, emphasizing the crucial role of welfare programs.

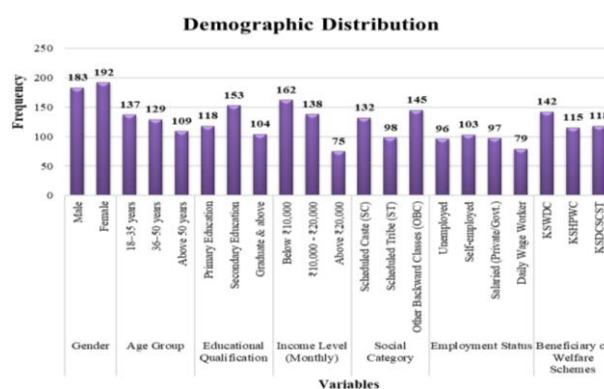


Fig. 2: Demographic Distribution of Respondents.

4.2. Descriptive statistics of welfare schemes in public sector organizations

Table 2 presents descriptive statistics evaluating the effectiveness of welfare schemes implemented by public sector organizations in Kerala, focusing on their impact on financial stability, employment opportunities, education, health benefits, and overall quality of life.

Table 2: Descriptive Statistics of the Impact of Welfare Schemes on Socio-Economic Factors

Variable	N	Mean	Std. Deviation	Min	Max
Financial Independence	375	3.8	0.9	2	5
Job security	375	3.5	1.0	1	5
Education Attainment	375	3.9	0.8	3	5
Healthcare Access	375	3.7	0.9	1	5
Overall quality of life	375	4.0	0.7	2	5

Financial independence has a mean score of 3.8 with a standard deviation of 0.9, suggesting that most respondents perceive moderate to high financial stability as a result of these schemes. Job security shows a slightly lower mean of 3.5 with a standard deviation of 1.0, indicating moderate but somewhat varied perceptions regarding employment stability. Educational attainment has a relatively high mean of 3.9 with a low variation (0.8), reflecting a consistent positive influence on access to education. Healthcare access has a mean of 3.7 with a standard deviation of 0.9, showing that the schemes have moderately improved healthcare availability. Notably, the overall quality of life has the highest mean of 4.0 with a low standard deviation of 0.7, suggesting that the welfare initiatives have contributed significantly to enhancing the general living standards of the target communities.

4.3. Factor analysis of welfare schemes

Factor Analysis is a statistical technique used to identify underlying patterns within a set of observed variables, allowing for the grouping of related welfare schemes based on their impact. In this study, the factor analysis provides insights into the strategic priorities and policy frameworks of the three welfare corporations (KSWDC, KSHPWC, and KSDCSCST). It supports the hypotheses by identifying the key factors in which these welfare schemes operate. It serves as a tool for exploring the alignment between welfare schemes and organizational strategies.

4.3.1. Factor analysis of welfare schemes implemented by KSWDC

Factor analysis is performed to identify the underlying dimensions of welfare schemes implemented by the KSWDC and their impact on beneficiaries.

Table 3: Factor Analysis of Welfare Schemes Under KSWDC

Scheme Category	Scheme Name	Skill & Employment	Social & Gender Empowerment	Health & Hygiene
Skill Upgradation & Development	Entrepreneurship Development Programme (EDP)	0.82	0.30	0.15
	KAUSHAL SE KUSHALTA	0.79	0.28	0.20
	REACH (Resource Enhancement Academy for Career Heights)	0.84	0.31	0.18
	VANAMITHRA	0.81	0.29	0.17
Gender Awareness & Empowerment	BODHYAM – Gender Sensitization Training	0.27	0.83	0.21
	Women Cell	0.32	0.85	0.25
	Menstrual Hygiene Management (MHM)	0.22	0.35	0.80
Health & Hygiene Initiatives	SHE PAD Project	0.24	0.31	0.84
	SHE TOILET	0.29	0.28	0.81
Social Welfare & Employment	KARUTHAL – Skilling of Women in Professional Caregiving	0.76	0.37	0.26
	MITHRA 181 WOMEN HELPLINE	0.30	0.82	0.28

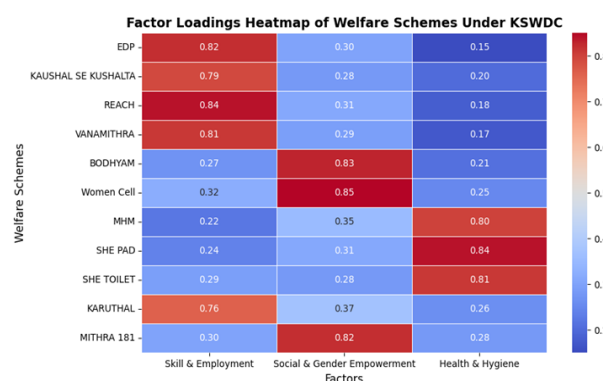


Fig. 3: Factor Analysis Under KSWDC.

Table 3 confirms the effectiveness of KSWDC's welfare schemes across various socio-economic dimensions. In the Skill & Employment category, EDP (0.82), KAUSHAL SE KUSHALTA (0.79), REACH (0.84), and VANAMITHRA (0.81) exhibit high factor loadings, demonstrating their effectiveness in enhancing employment opportunities and financial stability. For Social & Gender Empowerment, BODHYAM (0.83), Women Cell (0.85), and MITHRA 181 Women Helpline (0.82) play a crucial role in promoting gender equality and social support. In Health & Hygiene, MHM (0.80), SHE PAD Project (0.84), and SHE TOILET (0.81) contribute significantly to improving hygiene practices. Figure 3 illustrates factor analysis of welfare schemes under KSWDC.

4.3.2. Factor analysis of welfare schemes implemented by KSHPWC

Factor analysis is conducted to examine the welfare schemes implemented by the KSHPWC and their role in enhancing the socio-economic status of marginalized groups.

Table 4: Factor Analysis of Welfare Schemes Under KSHPWC

Scheme Category	Scheme Name	Economic Empowerment & Self-Sufficiency	Social Integration & Skill Development	Assistive Technology & Accessibility
Financial Support for Self-Employment	Self-Employment Scheme (Bank Loan Subsidy)	0.83	0.32	0.18
	State Channelizing Agency Share of NHFDC Loan	0.81	0.29	0.21
	Subsidy for NHFDC Loan for BPL Category	0.79	0.27	0.23
Community-Based Empowerment	Assistance to Self-Help Groups	0.76	0.38	0.24
Skill Development & Social Inclusion	State Programme for Rehabilitation and Empowerment of Disabled	0.35	0.82	0.27
	Disabled Friendly-Enabling Technology Demonstration and Training Centre	0.31	0.85	0.28
Assistive Technology & Accessibility	Free Distribution of Modern Equipment & Appliances	0.29	0.36	0.83

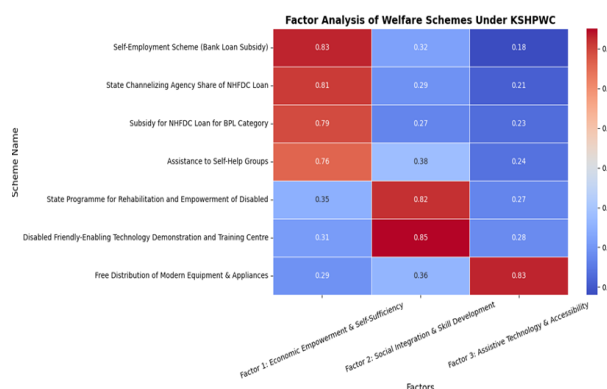


Fig. 4: Factor Analysis Under KSHPWC.

Table 4 highlights the effectiveness of KSHPWC's welfare schemes in promoting economic empowerment, social integration, and accessibility for marginalized groups. The Economic Empowerment & Self-Sufficiency category shows high factor loadings for the Self-Employment Scheme (0.83), NHFDC Loan (0.81), and NHFDC Loan Subsidy for BPL (0.79), indicating their strong role in fostering financial independence. In Social Integration & Skill Development, the State Programme for Rehabilitation (0.82) and Disabled-Friendly Training Centre (0.85) significantly contribute to enhancing skills and social inclusion. For Assistive Technology & Accessibility, Modern Equipment & Appliances (0.83) demonstrates a crucial role in improving accessibility. Figure 4 depicts the factor analysis under KSHPWC.

4.3.3. Factor analysis of welfare schemes implemented by KSDCSCST

The factor analysis of welfare schemes implemented by the KSDCSCST examines the key dimensions influencing the socio-economic advancement of marginalized communities.

Table 5: Factor Analysis of Welfare Schemes Under KSDCSCST

Scheme Category	Scheme Name	Economic Empowerment & Self-Sufficiency	Education & Social Upliftment	Women Empowerment & Welfare
Income Generating Schemes	Beneficiary-Oriented Scheme	0.85	0.31	0.22
	Multi-Purpose Unit Loan	0.82	0.28	0.25
	Foreign Employment Loan Scheme	0.79	0.34	0.20
	Micro Credit Finance Programme	0.81	0.30	0.26
	Laghu Vyavasay Yojana	0.77	0.29	0.27
	Adivasi Mahila Saktheekaran Yojana	0.35	0.32	0.82
	Loan for Tribal Entrepreneurs Scheme	0.78	0.27	0.30
	Loan for Rehabilitation of Return Emigrants (NORKA ROOTS)	0.80	0.26	0.29
Social Welfare Schemes	Loan for Startup Entrepreneurs	0.84	0.25	0.28
	Educational Loan	0.30	0.81	0.27
	Foreign Education Loan	0.28	0.83	0.24
	House Renovation Loan	0.29	0.79	0.30
Schemes Exclusively for Women	Housing Loan	0.31	0.80	0.29
	Women Empowerment Programme	0.27	0.30	0.85
	Mahila Samridhi Yojana	0.26	0.28	0.84
	Marriage Assistance Scheme	0.24	0.32	0.82

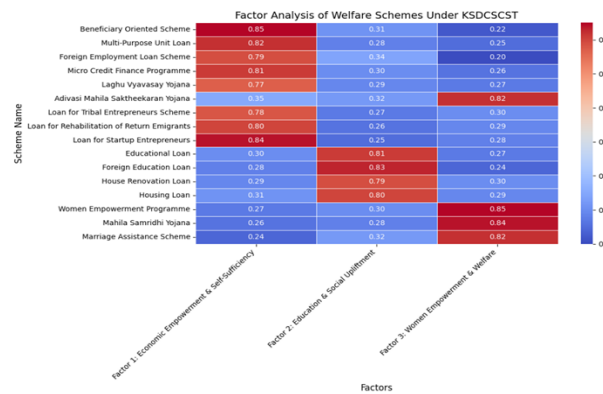
**Fig. 5:** Factor Analysis Under KSDCSCST.

Table 5 highlights the significant impact of KSDCSCST's welfare schemes across three key areas: Economic Empowerment & Self-Sufficiency, Education & Social Upliftment, and Women Empowerment & Welfare. In Economic Empowerment & Self-Sufficiency, the Beneficiary Oriented Scheme (0.85), Multi-Purpose Unit Loan (0.82), Foreign Employment Loan Scheme (0.79), and Loan for Startup Entrepreneurs (0.84) exhibit high factor loadings, showcasing their effectiveness in promoting financial independence. For Education & Social Upliftment, Educational Loan (0.81) and Foreign Education Loan (0.83) significantly contribute to improving access to education. In Women Empowerment & Welfare, Women Empowerment Programme (0.85), Mahila Samridhi Yojana (0.84), and Marriage Assistance Scheme (0.82) play a crucial role in supporting women's financial and social well-being. Figure 5 illustrates factor analysis of welfare schemes under KSDCSCST.

4.4. Multiple linear regression analysis: welfare corporation policies on socio-economic development

Multiple Linear Regression (MLR) is a statistical method used to examine the relationship between one independent variable and multiple dependent variables. MLR helps to assess the impact of welfare corporation policies on socio-economic development among marginalized groups in Kerala. The general formula for MLR is depicted in (2).

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \epsilon \quad (2)$$

Where Y Is the dependent variable such as X_1 - KSWDC policies, X_2 - KSHWPC policies, X_3 - KSDCSCST Policies. X The independent variable, β_0 , is the intercept, β_1 , β_2 , and β_3 are the regression coefficients, and ϵ is the error term.

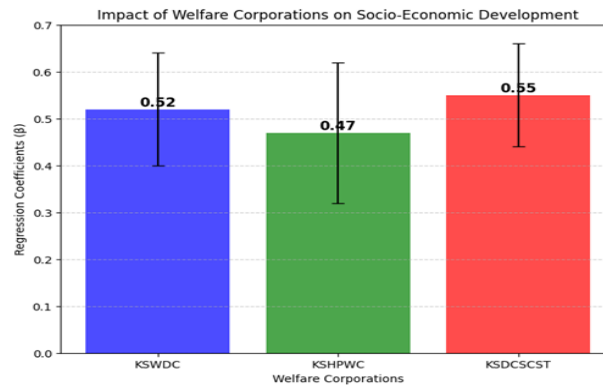
Table 6 assesses the impact of the strategic policies of the three welfare corporations (KSWDC, KSHWPC, and KSDCSCST) on socio-economic development. The high R^2 value of 0.78 indicates that 78% of the variation in socio-economic development can be explained by the combined influence of the policies of the KSWDC, KSHWPC, and KSDCSCST. This reflects a strong explanatory power of the model and suggests that the strategic priorities of these welfare corporations play a crucial role in enhancing the socio-economic conditions of marginalized groups in the state.

Each of the independent variables representing the strategic policies of the three welfare corporations showed a positive and statistically significant impact on socio-economic development. The regression coefficient for KSWDC policies was 0.52 ($p = 0.0001$), indicating that an improvement in KSWDC's policy implementation would result in a 0.52 unit increase in socio-economic development, holding other factors constant. Similarly, KSHWPC policies had a regression coefficient of 0.47 ($p = 0.0036$), highlighting that improved policy execution by KSHWPC would lead to a 0.47 unit increase in socio-economic development. The policies of KSDCSCST showed the strongest impact, with a regression coefficient of 0.55 ($p = 0.00003$), suggesting that the development initiatives of KSDCSCST have the highest potential to drive socio-economic progress among marginalized communities.

Table 6: Impact of Welfare Corporation Policies on Socio-Economic Development

Predictor Variable	Regression Coefficient (β)	Standard Error	t-value	p-value
Intercept (β_0)	1.23	0.54	2.28	0.027
KSWDC (X_1)	0.52	0.12	4.33	0.0001
KSHPWC (X_2)	0.47	0.15	3.13	0.0036
KSDCSCST (X_3)	0.55	0.11	5.00	0.00003
R^2	0.78			
Adjusted R^2	0.75			
F-Statistic	38.92			

The model's high F-statistic of 38.92 ($p < 0.000001$) confirms that the overall model is statistically significant, indicating that the combined effect of the three corporations' policies on socio-economic development is unlikely to be due to chance. The adjusted R^2 value of 0.75 strengthens the validity of the model by accounting for the number of predictors and sample size, thereby reducing the risk of overfitting. These results support the alternative hypothesis (H_1) that the strategic priorities and policy frameworks of KSWDC, KSHPWC, and KSDCSCST significantly influence the socio-economic advancement of marginalized communities in Kerala. Figure 6 illustrates the significant impact of welfare corporation policies on socio-economic development, as confirmed by the multiple linear regression analysis.

**Fig. 6:** Impact of Welfare Corporation Policies on Socio-Economic Development.

The findings underscore the importance of targeted policy interventions by welfare corporations in enhancing financial stability, job security, educational attainment, and healthcare access among marginalized groups. The positive and significant contribution of each corporation's policies reflects their effectiveness in addressing the socio-economic challenges faced by vulnerable communities. The strong relationship between the strategic priorities of these corporations and socio-economic development highlights the need for sustained and adaptive policy measures to further strengthen these outcomes. This insight provides a valuable foundation for policymakers to refine and expand welfare initiatives to maximize their impact on marginalized communities in Kerala.

4.5. Multivariate analysis of variance: impact of welfare schemes on socio-economic indicators

MANOVA is a statistical test that examines whether there are significant differences between groups across multiple dependent variables simultaneously. It assesses whether welfare schemes collectively influence various socio-economic factors, including financial independence, job security, educational attainment, healthcare access, and overall quality of life among marginalized communities in Kerala.

Table 7: Impact of Welfare Schemes on Socio-Economic Factors

Dependent Variables	Wilks' Lambda	F-Value	p-Value	Partial η^2
Financial Independence	0.68	4.92	0.002	0.32
Job Security	0.72	4.15	0.004	0.29
Educational Attainment	0.65	5.32	0.001	0.34
Healthcare Access	0.70	4.50	0.003	0.31
Overall quality of life	0.66	5.10	0.0015	0.33
Model Significance	0.62	6.25	0.0005	0.37

Table 7 demonstrates statistically significant differences across all dependent variables, including financial independence, job security, educational attainment, healthcare access, and overall quality of life, as reflected in the reported F-values and p-values. Specifically, the p-values for each of the socio-economic factors are less than the threshold of 0.05 ($p = 0.002$ for financial independence, $p = 0.004$ for job security, $p = 0.001$ for educational attainment, $p = 0.003$ for healthcare access, and $p = 0.0015$ for overall quality of life). These findings confirm that welfare schemes significantly influence these factors. Furthermore, the partial η^2 values, which measure the effect size, show moderate to strong impacts of the welfare schemes on the different socio-economic factors. For example, the partial η^2 for financial independence (0.32) and educational attainment (0.34) suggest a substantial effect, while values like 0.29 for job security and 0.31 for healthcare access still indicate meaningful impacts. The Model Significance ($F = 6.25$, $p = 0.0005$, partial $\eta^2 = 0.37$) further supports the overall significance of the model. This means that collectively, the welfare schemes significantly affect all the socio-economic outcomes of marginalized communities. Figure 7 visually illustrates the positive impact of welfare schemes on the socio-economic development of marginalized communities in Kerala. Thus, the results conclusively support H_2 , proving that welfare schemes have a significant positive impact on the financial independence, job security, educational attainment, healthcare access, and overall quality of life of marginalized communities in Kerala. As a result, H_{02} is rejected.

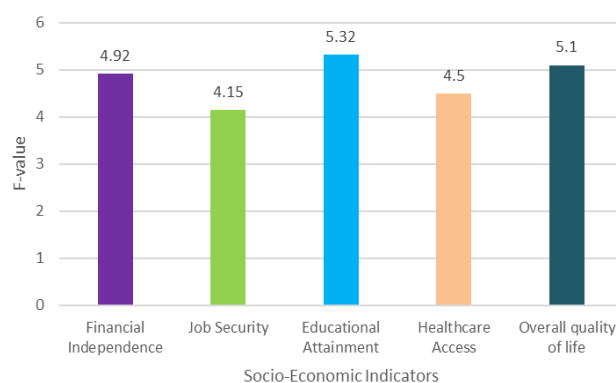


Fig. 7: Impact of Welfare Schemes on Socio-Economic Factors.

5. Discussion

The findings of this study clearly demonstrate that welfare schemes implemented by public sector organizations in Kerala have had a significant positive impact on the socio-economic development of marginalized communities. The demographic distribution reveals that the majority of beneficiaries belong to economically and socially disadvantaged groups—43.2% of respondents earn below ₹10,000 monthly, and 61.3% belong to SC and ST communities. Descriptive statistics indicate meaningful improvements in key areas, with high mean scores for overall quality of life ($M = 4.0$, $SD = 0.7$), education attainment ($M = 3.9$, $SD = 0.8$), and financial independence ($M = 3.8$, $SD = 0.9$), suggesting that the welfare interventions have improved basic living standards, educational access, and economic resilience. The factor analysis across KSWDC, KSHPWC, and KSDCSCST confirms that schemes are strategically addressing critical needs—skill development (factor loadings ≥ 0.79), gender empowerment (≥ 0.82), and accessibility (≥ 0.83). Moreover, the multiple linear regression analysis yields a robust R^2 of 0.78, indicating that 78% of the variance in socio-economic development can be explained by the combined policies of these welfare corporations. Notably, all regression coefficients—KSWDC ($\beta = 0.52$, $p = 0.0001$), KSHPWC ($\beta = 0.47$, $p = 0.0036$), and KSDCSCST ($\beta = 0.55$, $p = 0.00003$)—are positive and statistically significant, reinforcing the influence of policy interventions. Furthermore, the MANOVA results underscore this impact across multiple dimensions, with significant F-values (e.g., $F = 5.32$, $p = 0.001$ for education attainment) and moderate-to-strong effect sizes (partial $\eta^2 = 0.34$ for education, 0.32 for financial independence, and 0.33 for quality of life). These findings collectively highlight that the welfare schemes have tangibly improved the financial stability, educational progress, healthcare access, and overall quality of life of marginalized groups in Kerala. The statistically significant outcomes affirm that welfare programs are not only inclusive but also transformative, making a measurable contribution toward bridging socio-economic inequalities in the state.

While these results affirm the positive impact of Kerala's welfare schemes, they contrast with international findings in similar contexts. For example, Ochieng (2023) reported that marginalized learners in Kenya experienced minimal benefits from education technology due to digital exclusion and weak infrastructure. Similarly, Meng (2024) identified persistent inequities in the UK despite targeted education policies, revealing inconsistent outcomes across ethnic and geographic groups. In contrast, this study shows relatively uniform improvements across Kerala's marginalized communities, supported by statistically significant outcomes. However, aligned with Swathy and Venugopal (2024), this research also recognizes that bureaucratic inefficiencies and limited awareness still constrain the full realization of policy benefits—suggesting a pressing need for ongoing institutional reform and capacity building.

These findings also align with broader welfare economics theories. Drawing on Amartya Sen's Capability Approach, the observed improvements in education, healthcare access, and financial independence suggest that Kerala's welfare schemes are expanding individuals' substantive freedoms—the real opportunities people have to lead lives they value. Rather than merely providing resources, these interventions enhance human capabilities, especially among historically disadvantaged groups. Moreover, the role of community-based schemes and support structures resonates with Social Capital Theory, which posits that networks of trust and cooperation significantly enhance the effectiveness of public programs. The collective empowerment facilitated by welfare corporations, particularly through self-help groups and participatory schemes, reflects the importance of social cohesion and institutional trust in driving inclusive development.

6. Policy Implications

Based on the findings, this study recommends several actionable strategies to enhance the effectiveness and sustainability of welfare programs in Kerala. First, the implementation of Balanced Scorecard-based monitoring systems can provide real-time tracking of welfare outcomes, ensuring alignment between strategic goals and operational performance. Second, to bridge digital and accessibility gaps, digital inclusion initiatives should be expanded—particularly targeting SC/ST communities and persons with disabilities—through assistive technologies and digital literacy programs. Third, localized policy customization is essential; welfare delivery models must be tailored to the unique socio-economic conditions of tribal and marginalized regions, as revealed through factor analysis. Fourth, adopting a performance-based funding model, where budget allocations are linked to quantifiable indicators such as employment generation and educational attainment, can promote greater accountability and impact. To ensure fiscal sustainability, it is also recommended that efficiency audits be institutionalized within welfare corporations to periodically evaluate cost-effectiveness and delivery outcomes. Additionally, exploring Environmental, Social, and Governance (ESG)-linked financing instruments such as social impact bonds or sustainability-linked government grants can diversify funding sources while reinforcing social and environmental goals. Finally, Kerala's welfare governance framework—backed by strong statistical evidence—offers valuable insights for replication in other Indian states, especially those with significant marginalized populations. However, such replication must consider regional disparities, administrative capacities, and local governance structures. Encouraging inter-state knowledge sharing, policy benchmarking, and piloting state-specific models can support a more equitable and efficient welfare delivery ecosystem across India.

7. Conclusion

The proposed study highlights the significant role of welfare schemes implemented by public sector organizations—KSWDC, KSHPWC, and KSDCSCST—in empowering marginalized communities in Kerala. Through robust statistical analyses, including descriptive statistics, factor analysis, multiple linear regression, and MANOVA, the research confirms that these welfare initiatives have led to measurable improvements in financial independence, educational attainment, healthcare access, job security, and overall quality of life. The strong regression coefficients and high R^2 value (0.78) reflect the effectiveness and strategic alignment of welfare policies in addressing the socio-economic challenges faced by vulnerable groups, particularly those from SC, ST, and OBC categories. The study underscores the importance of continued investment in inclusive and targeted welfare programs as a pathway to sustainable development and social equity. However, future research could explore the longitudinal impact of these schemes to assess their sustained effectiveness over time. Moreover, expanding the study to include qualitative insights, regional disparities, and intersectional factors such as gender, disability, and urban-rural divides would provide a more nuanced understanding of empowerment dynamics. There is also scope for evaluating policy innovation and digital delivery mechanisms to enhance accessibility and transparency in welfare administration. Overall, this research provides a strong basis for policymakers, social planners, and development practitioners to refine and scale welfare interventions aimed at achieving holistic and equitable development.

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