



# Role of Haritha Karma Sena in Advancing Sustainable Development Across Kerala and Its Contribution to Key UN SDGs

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**Abstract:** Kerala has emerged as a model for sustainable development in India by integrating economic growth with environmental conservation and social well-being. The Haritha Karma Sena (HKS), established in 2017 under the Harithakeralam Mission, plays a pivotal role in the state's waste management system. Comprising over 35,352 trained women waste management professionals, HKS promotes waste reduction, segregation, and recycling, aligning with Kerala's broader sustainability goals. This study examines the role of HKS in advancing sustainable development and its contribution to key UN Sustainable Development Goals (SDGs), specifically SDG 1 (No Poverty), SDG 5 (Gender Equality), SDG 11 (Sustainable Cities & Communities), SDG 12 (Responsible Consumption & Production), and SDG 13 (Climate Action). Utilizing both primary and secondary data, the findings highlight HKS's effectiveness in managing non-biodegradable waste, fostering community participation, and providing stable employment opportunities, particularly for women and marginalized groups. The study underscores HKS's impact on environmental sustainability by preventing hazardous waste accumulation and promoting a circular economy, thus reducing pollution and greenhouse gas emissions. To enhance its long-term effectiveness, further expansion, technological advancements, and stronger policy support are recommended to ensure scalability and sustainability of its initiatives.

**Keywords:** Sustainable Development, Haritha Karma Sena (HKS), Circular Economy, Women Empowerment, Waste Management

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## INTRODUCTION

Kerala has emerged as a leading model of sustainable development in India by integrating economic growth with environmental conservation and social well-being. According to the NITI Aayog SDG India Index 2023-24, both Kerala and Uttarakhand scored 79 points, demonstrating strong performance across the 16 Sustainable Development Goals (SDGs). Kerala's overall score has improved from 75 in 2020-21 to 79 in 2023-24, reflecting progress in various developmental areas (NITI Aayog & United Nations Development Programme, 2024). Initiatives such as the Harithakeralam Mission, which emphasizes waste management and afforestation, along with responsible tourism efforts, have significantly contributed to environmental sustainability. The handling of waste is a crucial aspect of Kerala's sustainable development, as improper waste disposal leads to environmental degradation and public health concerns. Engaging communities through organizations like the Haritha Karma Sena is one of the most effective ways to address these challenges and drive sustainable development forward.

### Harithakarma Sena (HKS) (Green Army)

The Haritha Karma Sena (HKS) is a community-driven initiative established in 2017 under the

Harithakeralam Mission, Kerala's flagship cleanliness project. Comprising over 35,352 trained women waste management professionals, HKS represents a transformative approach to waste management, emphasizing reduction, segregation, and recycling over mere disposal. The initiative collaborates with organizations like Kudumbashree, Suchitwa Mission, Clean Kerala Company, and local bodies to promote sustainable waste management and green practices. By converting waste into valuable resources, such as using shredded plastics for road construction, HKS not only reduces environmental impact but also generates employment and fosters self-sufficiency in the waste management sector (Haritha Kerala Mission).

### **Statement of the Problem**

Effective waste management is a critical challenge in Kerala, where rapid urbanization, increasing consumption, and inadequate disposal mechanisms contribute to environmental pollution and health hazards. Despite various government initiatives, inefficient waste segregation, lack of public awareness, and limited infrastructure for recycling continue to pose significant obstacles to sustainable waste management.

Harithakarma Sena (HKS) was introduced as a decentralized, community-driven initiative to address these challenges by promoting responsible waste disposal, recycling, and environmental conservation. So it is essential to know the role of HKS in promoting sustainable development of Kerala. Additionally, the impact of HKS on achieving global sustainability targets, particularly the UN Sustainable Development Goals (SDGs), needs to be systematically analyzed to strengthen its effectiveness.

This study seeks to examine the role of Harithakarma Sena in Kerala's sustainable development, assessing its contributions to waste management, community engagement, and the circular economy. Furthermore, it aims to explore how HKS aligns with the UN SDGs and identify strategies to enhance its efficiency and long-term impact.

### **Objective of the study**

- To identify the role of Harithakarma Sena in promoting sustainable development in Kerala
- To identify the contribution of Harithakarma Sena's initiatives towards achieving the UN Sustainable Development Goals (SDGs), with a focus on SDG 1 – No Poverty, SDG 5 – Gender Equality, SDG 11 – Sustainable Cities & Communities, SDG 12 – Responsible Consumption & Production, and SDG 13 – Climate Action.

### **Research Methodology**

This study is descriptive and analytical in nature, utilizing both primary and secondary data to assess the role of Haritha Karma Sena (HKS) in advancing sustainable development practices in Kerala and its contribution to the implementation of the UN Sustainable Development Goals (SDGs).

### **Data Collection:**

Primary data was collected from 80 officials of Local Self-Government (LSG) bodies in Alappuzha district who are directly involved in the implementation and monitoring of HKS, including Chairpersons, Presidents, Ward Councillors/Members, CDS Officials and Consortium Leaders. The judgment sampling method was used to select the respondents. A structured questionnaire was developed and distributed to these officials to gather relevant information on their experiences and insights regarding the initiative.

Additionally, secondary data was sourced from various studies, reports, and records collected by both government and non-governmental organizations. These sources provided a comprehensive understanding of the HKS initiative and its alignment with sustainable development goals (SDGs).

## **DATA ANALYSIS**

The primary data collected was analysed using statistical tools such as percentages, mean scores, and standard deviation. Percentages were used to determine the distribution of responses, while mean scores assessed the intensity of officials' opinions. Statistical analysis was conducted using SPSS to ensure accuracy and reliability. The combination of these tools allowed for a detailed evaluation of the effectiveness and contributions of Haritha Karma Sena towards sustainable development in Kerala.

## **LITERATURE REVIEW**

### **Haritha Karma Sena**

Haritha Karma Sena (HKS) has been instrumental in waste collection, recycling, and community engagement initiatives in Kerala. Their waste reduction efforts generate revenue through the recycling of metals, plastics, organic waste, and other materials, making a significant contribution to the state's environmental sustainability. Women who are part of HKS are empowered with financial independence, with the program offering not only employment opportunities but also a platform for active community participation (Sajeev Kumar, B., 2024). However, one of the challenges HKS faces is the limited public participation in waste management efforts, especially in waste segregation at the source (Nishad, A., 2024). To effectively address the waste management issue in Kerala, increased public involvement and source segregation are critical. Community-based organizations like HKS play a transformative role in fostering a waste-conscious society, which is essential for managing the waste crisis and achieving sustainable development (Rajendran & Nair, 2017). HKS serves as an entrepreneurial platform for women, providing not only employment but also contributing to gender equality by offering financial autonomy and empowering women in the waste management sector (Sivakumar, 2019). With substantial revenue generated from recycling projects, HKS supports women's financial independence and contributes to the broader goal of sustainable development (Kumar, S. B., 2024).

## **SUSTAINABLE DEVELOPMENT**

Sustainable development is closely linked to urban waste management, as cities significantly contribute to climate change through waste practices. Involving informal waste workers in the waste management sector is essential for addressing hazardous waste in a sustainable manner (Onyanta, A., 2016). Landfilling has a notable environmental impact, particularly due to methane emissions that contribute to greenhouse gases. However, alternatives like composting and recycling can reduce emissions by up to 40%, highlighting the importance of sustainable waste management (Umar, T., 2020). According to the IPCC assessment report, effective waste management plays a crucial role in achieving various Sustainable Development Goals (SDGs), both directly and indirectly, while addressing climate change (Kopecká, Hrad, & Huber-Humer, 2024).

The integration of Circular Economy (CE) business models into waste management practices strengthens the connections between multiple SDGs, such as SDG 4 (Quality Education), SDG 5 (Gender Equality), SDG 7 (Affordable and Clean Energy), SDG 8 (Decent Work and Economic Growth), SDG 9 (Industry, Innovation, and Infrastructure), SDG 11 (Sustainable Cities and Communities), and SDG 12 (Responsible

Consumption and Production) (Puntillo, P., 2023). These models drive sustainable development by encouraging resource efficiency and minimizing waste.

As Mahajan and Bose (2018) define, sustainability involves integrating economic, social, and environmental factors into organizational strategies. Balancing these three dimensions is crucial for long-term success, with economic performance, social performance, and environmental performance being key indicators of sustainability (Medeiros, E., 2021). By focusing on profitability/earnings, community engagement, and waste reduction, organizations and communities can effectively measure their contributions to sustainable development.

This study identifies a research gap in understanding the specific role of Haritha Karma Sena (HKS) in advancing sustainable development in Kerala. While HKS is recognized for waste management, limited research explores its direct contributions to key UN Sustainable Development Goals (SDGs), including poverty reduction (SDG 1), gender equality (SDG 5), clean water and sanitation (SDG 6), responsible consumption (SDG 12), and climate action (SDG 13). Existing studies have not fully addressed the link between HKS's initiatives and broader sustainability efforts. This research aims to bridge this gap by analyzing HKS's impact on these SDGs within Kerala's sustainability framework.

## **ROLE OF HARITHAKARMA SENA IN KERALA'S SUSTAINABLE DEVELOPMENT**

The concept of the Triple Bottom Line (TBL), introduced by John Elkington in 1997, broadens the scope of business success beyond just economic profit, encompassing three interconnected dimensions: economic, social, and environmental sustainability. This framework suggests that an organization's success should be evaluated not only by its profitability but also by its impact on society and the environment (Govindan et al., 2013). Sustainable development is the concept of meeting present needs without compromising the ability of future generations to meet their own needs. It focuses on a balanced approach that integrates economic growth, environmental protection, and social well-being.

Harithakarma Sena (HKS) plays a vital role in Kerala's sustainable development by promoting efficient waste management, encouraging community participation, and contributing to the circular economy. Through its structured approach, HKS supports environmental conservation while generating social and economic benefits.

### **III.1 Environmental Performance of HKS-Waste Management and Recycling Initiatives**

**Table-1: Plastic waste Collection Per Month**

<b>Waste Collection in KG</b>	<b>No of Respondent</b>	<b>%</b>
Below 500Kg	6	7.5
500Kg to 1000Kg	13	16.25
1000Kg to 1500Kg	17	21.25
1500Kg to 2000Kg	37	46.25

Above2000 Kg	7	8.75
Total	80	100

Source: Primary Data

**Table-2: Other type of non-Bio-degradable waste Per Month**

Waste Collection in KG	No of Respondent	%
Below 500Kg	7	8.75
500Kg to 1000Kg	18	22.5
1000Kg to 1500Kg	32	40
1500Kg to 2000Kg	12	15
Above2000 Kg	11	13.75
Total	80	100

Source: Primary Data

The data clearly highlights the strong environmental performance of Haritha Karma Sena (HKS) through their active role in waste collection and management across Kerala. As shown in Table-1, a significant share of respondents (46.25%) collect 1500–2000 kg of plastic waste per month, while 21.25% manage 1000–1500 kg, indicating consistent and high-volume collection. In Table-2, 40% collect 1000–1500 kg of other non-biodegradable waste, and 13.75% handle over 2000 kg, reflecting HKS’s engagement beyond plastics—covering items such as metal, glass, and multilayer packaging.

This extensive grassroots operation is further emphasized by secondary data,( Equator Initiative 2024) which shows Kerala annually produces 6.47 lakh metric tons of non-biodegradable waste, with 1,553 metric tons of e-waste diverted to recyclers. These figures indicate that the decentralized waste management system led by HKS plays a crucial role in reducing landfill burden, promoting recycling, and preventing environmental hazards.

**Table-3: Effectiveness of Managing Wase by HKS**

Sl No	Effectiveness	No. of respondent	Percentage
1	Not Effective	0	0
2	Need Improvement	15	18

3	Moderately Effective	14	17
4	Effective	20	25
5	Highly Effective	31	38
<b>Mean Score</b>		<b>3.85</b>	
<b>SD</b>		<b>1.14</b>	

Table-3 reinforces this environmental impact by assessing the perceived effectiveness of HKS's waste management practices. Among 80 respondents, 38% rated their work as "Highly Effective," and another 25% as "Effective," with a mean score of 3.85 on a 5-point scale. The absence of any rating under "Not Effective" and the moderate standard deviation of 1.14 suggest a consistently positive performance with room for focused improvement.

Overall, this combination of quantitative waste collection data and qualitative effectiveness ratings clearly demonstrates that Haritha Karma Sena is a vital force in Kerala's environmental sustainability efforts. Their structured and large-scale waste management practices reflect a high level of operational effectiveness, contributing meaningfully to Kerala's green goals and circular economy framework.

### III.2 Social Performance of HKS-Community Engagement and Awareness Programs

**Table 4: Training/awareness Programme attended by HKS members per year**

No of Awareness	Frequency	Percentage
Less than 5	21	26.3
5 to 10	48	60.0
10-15	3	3.8
15-20	2	2.5
More than 20	6	7.5

The majority of officials (60%) believe that Haritha Karma Sena (HKS) members participate in at least 5 to 10 training or awareness programs on waste disposal, green protocols, and eco-friendly practices. These programs enhance their knowledge and skills, earning them the title of "Green Warriors." HKS members actively engage in community initiatives, collaborating with government agencies, educational institutions, and social gatherings to promote sustainable practices. Their efforts play a crucial role in spreading environmental awareness and fostering a greener society (Ministry of Jal Shakti, Department of Drinking Water & Sanitation). . Additionally, Haritha Karma Sena members, working in pairs, visit 250 households

per month, making this a highly effective community engagement program.

From this perspective, Haritha Karma Sena plays a crucial role in community engagement, strengthening their social contribution to sustainable development.

### III.3 Economic Performance of HKS-Contribution to Circular Economy and Green Employment-

**Table 5: Average Monthly salary received by HKS**

Salary	Frequency	Percentage
Below 5000	14	17.5
5000 to 10000	42	52.5
10000 to 15000	18	22.5
15000 to 20000	6	7.5
More than 20000	0	0

Based on primary data, Haritha Karma Sena (HKS) members earn an average salary of INR 5,000 to 10,000 per month. With a total of 35,352 members (Suchitwa Mission, n.d.), this results in an approximate salary distribution of over 200 crore annually through waste collection and processing.

#### Cash Paid by Clean Kerala Company to Haritha Karma Sena

**Table 6: Cash paid to Haritha Karma sena**

Sl No	Year	Cash Paid
1	January to March 2021	4467825
2	2021-22	23550519
2	2022-23	50805380
3	2023-24	95633229
4	April to November 2024	67219015
	Total	<b>241675968</b>

The data from Clean Kerala Company highlights the increasing financial support for Haritha Karma Sena (HKS), reflecting its growing role in Kerala's circular economy. The cash payments to HKS have significantly risen from ₹44.67 lakh in early 2021 to over ₹95.63 crore in 2023-24, with ₹67.21 crore



already disbursed in the first eight months of 2024. This upward trend indicates the expanding scale of waste collection, recycling, and resource recovery efforts led by HKS. The consistent increase in payments underscores HKS's contribution to sustainable waste management, employment generation, and economic empowerment, particularly for women. By reintegrating waste into productive use, HKS strengthens Kerala's

The initiative of HKS is not only reduces environmental impact but also provides economic empowerment, especially for women and marginalized communities, integrating them into the state's sustainability efforts and enhancing its economic performance

#### **IV. Contribution of Harithakarma Sena's initiatives towards achieving the UN Sustainable Development Goals (SDGs),**

Harithakarma Sena (HKS) plays a crucial role in achieving the UN Sustainable Development Goals (SDGs) by addressing key environmental and social challenges. Through its systematic waste management practices and community-driven approach, HKS directly contributes to multiple SDGs, enhancing Kerala's sustainability efforts.

**Table 7: Harithakarma Sena's Contribution to UN SDGs**

SI No	SDG	Statement	Mean	SD
1	SDG 1	To what extent do you agree that your work with Harithakarma Sena provides you with stable employment and financial security?	3.38	1.07
2	SDG 5	To what extent do you agree that your work with Harithakarma Sena has improved women's empowerment and financial independence?	3.41	0.96
3	SDG 11	To what extent do you agree that Harithakarma Sena's waste management efforts have contributed to cleaner and healthier communities	3.56	1.16
4	SDG 12	To what extent do you agree that Harithakarma Sena promotes waste recycling and upcycling, reducing environmental pollution?"	3.74	1.13
5	SDG 13	To what extent do you agree that your role in waste management through Harithakarma Sena helps in reducing environmental degradation and combating climate change?	4.03	0.95

1. The study assessed the contribution of Haritha Karma Sena (HKS) to achieving UN Sustainable Development Goals (SDGs) by collecting opinions from 80 officials using a 5-point Likert scale. The results indicate that HKS has a notable impact across various SDGs.
2. SDG 1 (No Poverty): The mean score of 3.38 suggests that HKS provides moderate financial



security and stable employment to its members.

3. SDG 5 (Gender Equality): With a mean score of 3.41, HKS is seen as contributing to women's empowerment and financial independence.
4. SDG 11 (Sustainable Cities & Communities): A mean score of 3.56 highlights HKS's role in maintaining cleaner and healthier communities.
5. SDG 12 (Responsible Consumption & Production): The highest mean score after SDG 13, at 3.74, reflects HKS's strong efforts in promoting recycling and reducing environmental pollution.
6. SDG 13 (Climate Action): Achieving the highest mean score of 4.03, HKS's waste management initiatives are perceived as significantly contributing to environmental protection and climate change mitigation.
7. Overall, the findings indicate that HKS plays a crucial role in sustainable development, with its strongest contributions in waste management, recycling, and climate action

## **FINDING AND SUGGESTIONS**

### **Findings**

#### **To identify the role of Harithakarma Sena in promoting sustainable development in Kerala**

The analysis of Harithakarma Sena's (HKS) role in promoting sustainable development in Kerala highlights its contributions across environmental, social, and economic dimensions.

##### **1. Strong Environmental Contribution:**

- Harithakarma Sena (HKS) demonstrates a significant environmental role by actively engaging in decentralized waste management across Kerala.
- As per primary data, 46.25% of respondents reported collecting 1500–2000 kg of plastic waste monthly, and 40% managed 1000–1500 kg of other non-biodegradable waste, highlighting their extensive contribution to minimizing landfill pressure and promoting recycling.
- The effectiveness of their waste management practices was rated positively, with 38% considering it “Highly Effective” and 25% as “Effective,” achieving a mean score of 3.85 on a 5-point Likert scale, indicating overall satisfaction with HKS's environmental performance.

##### **2. Social Empowerment through Community Engagement:**

- The social dimension of sustainable development is strengthened by HKS through awareness campaigns, household visits, and participation in training programs.
- A majority (60%) of the members attend 5 to 10 awareness or training programs annually, equipping them with knowledge on eco-friendly practices.
- The structured interaction with 250 households per month per team further emphasizes their grassroots presence, building community participation in sustainable practices.

##### **3. Economic Impact and Promotion of Circular Economy:**

- Economically, HKS contributes to the circular economy by converting waste into a source of livelihood, especially for women and marginalized sections.

- The majority (52.5%) of members earn between ₹5,000 to ₹10,000 per month, offering a sustainable source of income.
- Financial records from Clean Kerala Company indicate a rising trend in payments, from ₹44.67 lakh in early 2021 to ₹95.63 crore in 2023–24, and ₹67.21 crore in the first eight months of 2024 alone. This growing investment highlights the expanding economic footprint of HKS in waste management and green employment.

**Contribution of Harithakarma Sena (HKS) towards achieving the UN Sustainable Development Goals (SDGs), particularly focusing on SDG 1 (No Poverty), SDG 5 (Gender Equality), SDG 11 (Sustainable Cities & Communities), SDG 12 (Responsible Consumption & Production), and SDG 13 (Climate Action). Based on data collected from 80 officials using a 5-point Likert scale, the following findings were derived:**

#### **Contribution to SDG 1: No Poverty**

- The study found that HKS provides moderate financial security and stable employment to its members, as indicated by a mean score of 3.38.
- With over 35,352 members, HKS has generated substantial employment opportunities, particularly for marginalized groups, thereby reducing economic vulnerability.
- The increasing financial support from Clean Kerala Company, amounting to over ₹241 crore between 2021 and 2024, highlights the economic sustainability of HKS's waste management initiatives.

#### **Contribution to SDG 5: Gender Equality**

- HKS has played a significant role in empowering women through employment opportunities and financial independence, as evidenced by a mean score of 3.41.
- A large portion of HKS members are women, contributing to gender-inclusive economic activities and fostering social empowerment.
- The initiative has enabled women to actively participate in community development while gaining financial stability, thereby reducing gender disparities in employment.

#### **Contribution to SDG 11: Sustainable Cities & Communities**

- With a mean score of 3.56, the study highlights HKS's effectiveness in maintaining cleaner and healthier communities through organized waste collection and recycling.
- Prior to HKS's formation, unorganized waste disposal led to environmental hazards such as pollution and greenhouse gas emissions.
- By collecting and processing 6.47 lakh metric tons of waste annually, HKS has significantly improved urban and rural cleanliness, enhancing public health and sustainable urban management.

#### **Contribution to SDG 12: Responsible Consumption & Production**

- HKS's role in promoting recycling and upcycling has been recognized with a mean score of 3.74, reflecting its strong efforts in sustainable waste management.
- The initiative prevents hazardous waste accumulation by systematically collecting and directing non-

biodegradable waste to Clean Kerala Company and other recyclers.

- By encouraging the use of eco-friendly alternatives such as cloth and paper bags, HKS has contributed to reducing plastic pollution and fostering a circular economy.

#### **Contribution to SDG 13: Climate Action**

- HKS's contribution to environmental sustainability and climate change mitigation received the highest mean score of 4.03.
- By diverting significant amounts of waste from landfills and incineration, HKS has helped in reducing greenhouse gas emissions, which directly impact global warming.
- The initiative aligns with the 'Reduce, Reuse, Recycle' principle, fostering sustainable waste disposal practices that contribute to climate resilience

#### **Suggestions**

Suggestions to enhance the role of Harithakarma Sena (HKS) in promoting sustainable development in Kerala while strengthening its contribution to achieving the UN SDGs

#### **Environmental Initiatives**

1. Expand Waste Collection Infrastructure – Strengthen waste collection systems by increasing the number of collection centers and providing better waste segregation facilities to enhance recycling rates.
2. Introduce Incentives for Households – Provide rewards or discounts on utility bills for households that effectively segregate and minimize waste, encouraging responsible waste disposal.
3. Enhance Awareness Campaigns – Increase the frequency of educational programs in schools and communities to promote the 3R (Reduce, Reuse, Recycle) principle and sustainable waste management.
4. Promote Biodegradable Alternatives – Collaborate with local businesses and self-help groups to scale up the production and distribution of eco-friendly alternatives like cloth and paper bags.
5. Improve Data Monitoring & Reporting – Implement a digital tracking system for waste collection and recycling to measure HKS's impact and optimize resource management.

#### **Social & Economic Empowerment**

6. Increase Financial Support for Members – Advocate for higher wages and better financial incentives for HKS members to ensure job security and improve their standard of living.
7. Enhance Gender Inclusion Strategies – Develop special training programs for women to take leadership roles within HKS, promoting gender equality and skill development.
8. Expand Employment Opportunities – Create additional job roles within HKS, such as trainers, supervisors, and sustainability consultants, to boost green employment.

#### **Policy & Collaboration**

9. Strengthen Public-Private Partnerships – Work closely with private companies, NGOs, and local governments to enhance waste processing technologies and expand funding opportunities.

10. Integrate HKS Initiatives into Urban Planning – Encourage local governing bodies to incorporate HKS-led waste management solutions into city development plans, ensuring long-term sustainability and resilience.

## CONCLUSION

Harithakarma Sena (HKS) plays a crucial role in promoting sustainable development in Kerala by effectively managing non-biodegradable waste and enhancing recycling practices. Its initiatives have significantly improved environmental sustainability while fostering community participation through awareness programs and household waste collection efforts. Economically, HKS has provided stable employment opportunities, particularly for women and marginalized groups, contributing to financial security and social empowerment. The study highlights HKS's contribution to achieving key UN Sustainable Development Goals (SDGs), including SDG 1 (No Poverty), SDG 5 (Gender Equality), SDG 11 (Sustainable Cities & Communities), SDG 12 (Responsible Consumption & Production), and SDG 13 (Climate Action). By preventing hazardous waste accumulation and promoting a circular economy, HKS has strengthened Kerala's waste management system while reducing pollution and greenhouse gas emissions. To enhance its impact, further expansion, technological advancements, and stronger policy support are needed to ensure long-term sustainability and scalability of its initiatives.

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