

Women, Waste, and Decentralised Urban Environmental Governance: A Comparative Analysis of Haritha Karma Sena and Global Community-Based Waste Management Models

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Abstract

This paper attempts to analyse the case of Haritha Karma Sena (HKS) in Kerala and some of the waste management systems in the world that are based in local communities, to compare three aspects of decentralised waste governance, namely social inclusion of women, financial independence of the community, and environmental benefits of the system. Officially, it is a waste collection and resource recovery model for inorganic waste, institutionalised by the women through the Kudumbashree and the local self-government system of Kerala and described as a statewide mechanism for collecting, sorting and transferring inorganic waste to authorized waste processing systems as HKS. The models of HKS and SWaCH in Pune, waste picker cooperatives in Brazil and community waste banks in Indonesia are compared with each other because they represent different configurations of labour organisation, municipal partnership, value capture from recycling and gendered participation in the process.

The analysis reveals that HKS is particularly successful in institutionalizing women's participation in public environmental service delivery, mainly because it is situated in an already established women's economy and does not see women as “incidental” labour in a male-dominated recycling industry. Meanwhile, the model is up against major institutional hurdles such as disparities in compensation, fee-recovery issues, infrastructural limitations, occupational stigma, and ambiguities due to the mixed nature of the model as micro-enterprise and public-service mechanism. The figures released by the state recently show that in the last 12 months (April 2024 to February 2025), 35,214 active members of the HKS from 4,438 units collected 50,190 tonnes of non-biodegradable waste and received Rs 341 crore in user fees, in addition to Rs 7.8 crore for handing over sorted waste to the Clean Kerala Company, which suggests a significant livelihood base in the Kudumbashree system. The paper concludes that HKS can only be transferred to urban areas in developing countries as an institutional package, comprising women's collectives, the municipal authority, user fee legitimacy, decentralised sorting infrastructure and secure downstream recovery system.

Keywords: Haritha Karma Sena, Kudumbashree, decentralised waste management, women's empowerment, community-based waste systems, circular economy, urban environmental governance

Introduction

Waste management is one of the most conflictual spheres of urban governance in the global South, interrelating with the domains of public health, environmental sustainability and infrastructure inequity and with the informal sector of labour. Many developing areas have not had a high rate of coverage of centralised collection and disposal services and are facing difficulties with technical service models, particularly in areas with dense settlements, limited municipal capacity and low source segregation. This has brought back to focus the decentralised and community based waste management systems which manage collection, sorting, recycling, and citizens participation near the households and neighbourhoods. Of these, Kerala's Haritha Karma Sena is a key model. According to official and mission sources, HKS is a women-led collective, which is primarily engaged in collecting, sorting and bringing inorganic waste to the authorised agencies for recycling and final processing, among the local self-governments. Created under the wider decentralised waste governance system under Kerala, HKS has emerged as a large-scale environmental service system and not a small pilot intervention. The model can be said to be significant not only for waste management but also for the combination of livelihood, local environmental management, and social recognition by means of the women's collective framework supported by the government.

This paper is an attempt to position HKS in a comparative perspective with other community-based waste management systems around the world (in particular, SWaCH in Pune, waste picker cooperatives in Brazil and waste bank systems in Indonesia). These comparisons can clarify if there are any particular characteristics of HKS with respect to social inclusion of women, women's financial autonomy, and effectiveness in environmental protection, and if the institutional structure is transferable to other urban areas in developing countries. The central arguments made here are that, while HKS is a strong model of decentralised environmental governance, it relies critically on the everyday institutional support, labour dignity and, infrastructural coordination.

Research purpose and analytical approach

This paper has four aims. Firstly, it is a record of the institutional logic of HKS as an model of waste management system in the form of decentralisation based on the collaboration of women's collective labour and local governments. Second, it compares HKS with selected other international community-based waste systems to analyse the various pathways of gender inclusion and environmental service delivery. Third, it pinpoints critical institutional issues that are relevant to the HKS units, including issues of earnings, recognition, compliance and infrastructure. Finally, it assesses the applicability of the model in cities in other developing nations, where governance is fragmented and informal economies are prevalent, thus affecting the nature of waste systems in distinct ways from Kerala.

This paper adopts a comparative conceptual review approach based on institutional documents publicly accessible, mission reports, secondary case materials and comparative urban waste governance literature. The discussion is organized along the three analytical dimensions of women's social inclusion, financial self-sufficiency, and environmental performance. Social inclusion of women, in this context, is the extent to which the model provides women working in the waste sector with a public role, collective identity, decision-making opportunities and social recognition. Financial autonomy is the regularity of income, control over income, opportunities for enterprise growth, and waste work to meaningful livelihood security. Environmental effectiveness is defined as collection coverage, segregation quality, material

recovery, prevention of littering and dumping, and trusted chain from households to recycling or to an authorised disposal.

Haritha Karma Sena in context

HKS has to be seen in the unique governance architecture of Kerala. The model is a reaction to the constant waste problem and the pressure that has been growing to adopt decentralised waste management due to the failures of centralised dumping and local opposition to disposal sites. The state government placed HKS in a governance framework that has Kudumbashree, local governments, Suchitwa Mission, Haritha Keralam Mission, and Clean Kerala Company. This created a multi-level institutional base for the model: households segregated waste, womens groups daily collected and sorted waste, local bodies supported the model and downstream agencies received waste for processing.

Official descriptions state that the HKS workers periodically pick up non-biodegradable waste from households and establishments, sorting the waste and conveying it to the shredding units or to the authorized recycling channels. According to the Local Self Government Department of Kerala, HKS is a group of workers from Kudumbashree network who take up the task of collection, segregation and handing over of inorganic waste to the proper authorities and that more than 36,000 workers participate in the removal of inorganic waste from the state, with each removing approximately 10,000 tonnes of waste per month. According to a recent report from the state sponsored organizations, from April 2024 to February 2025, 35,214 women in 4,438 units collected 50,190 tonnes of non-biodegradable waste. These numbers make the HKS one of the biggest female-led decentralised waste service systems recorded in the current debates on urban governance in South Asia.

The significance of the model is also in the context in which waste work is presented. Collection is not only low status sanitation labour, official discourses define the people doing the job as green workers who are involved in protecting the environment, maintaining cleanliness and promoting local sustainability. The symbolization of waste work has significance as social meaning shapes public cooperation, worker dignity and the women's legitimation in public space. HKS is thus at once a waste collecting system, a women's livelihood program and an environmental citizenship project.

Comparative models from the global South

One of the closest comparators is SWaCH in Pune which also includes door-to-door collection, user-fee financing and waste picker organisation in the municipal service arrangement. SWaCH is a cooperative entity of waste pickers, with all workers as members and supported by the Pune Municipal Corporation, which collects segregated waste from households and generates income by charging user fees and selling the recyclable waste. Additionally, it has been reported that workers usually provide services to 250-350 households, and that direct user-fee is appreciated because it is transparent, accountable, and empowers women. In contrast to HKS, however, SWaCH was formed out of labour organising and municipal co-operation, and not as a result of a state sponsored network for the alleviation of women's poverty.

Another big comparator comes from Brazilian waste picker cooperatives. WIEGO estimates that there are approximately 281,000 waste pickers in Brazil, of which approximately 30% are women. The membership in cooperative or association is a vital pathway to collective organisation, occupational identity and strengthening bargaining power within the recycling chains. Meanwhile, WIEGO's research on gender reveals that the women in these cooperatives remain subjected to various forms of oppression and gender-

based inequalities, highlighting that collective organisation is not necessarily an automatic cure for internal power relations.

The third important model is the waste bank systems in Indonesia. Research on women in waste banks highlights the importance of creating environmental awareness through such systems, in addition to strengthening household waste segregation, creating local social capital and sometimes providing women with additional income from waste exchange and valorisation. Community waste banks have also been recently portrayed as a factor for the environmental resilience of the community and for the practice of the circular economy. However, many waste banks are not so much collection networks with formal public-service responsibilities, as a system of savings, awareness and mobilisation, which is territorially universalised.

Each of these three comparators represents a different pathway or track for community based waste systems to function. Laboratory case studies on SWaCH show how labour is integrated in the cooperative organisation and through negotiated recognition by the municipality. The possibilities and limits of formalisation of informal recyclers through association and collective enterprise are illustrated in the Brazilian cooperatives. The waste banks in Indonesia illustrate effective community behavioural mobilisation and women's participatory environmental action. Although overlapping with all three, HKS is unique in that it integrates women's collective mobilisation, official decentralised governance, and regular service provision, all at the statewide level.

Women's social inclusion across models

The institutionalisation of women's participation from the beginning is an aspect which is particularly remarkable in HKS. Because the system is predominantly populated by women from Kudumbashree, participation is built into an existing federated system with previous experience of self-help organisation, local development activities, and mobilisation at the neighborhood level. This organisational legacy is what separates HKS from other waste systems in which women are integrated into a pre-existing, male dominated, or stigmatised waste economy without collective leverage. In HKS women are not only filling the gap in the labour force but they are the recognised frontline in local environmental service.

It has a number of social implications. First, HKS provides public roles for women, which are more than domestic, and assigns them to regular service contacts with residents and local institutions, within a space that is known to them. Second, green talk and green care raise their profile above the social stigma often associated with waste management. Thirdly, the collective could enhance solidarity and mutual support, which are essential to women when they participate in precarious and publicly visible work.

In contrast to Brazil, HKS has a more overtly gender intentional model of inclusion. The research conducted by WIEGO on waste picker cooperatives in Brazil reveals that women are often excluded and are subjected to invisibilised work and unequal power dynamics in some organisations that are not necessarily gender equitable. This is not the fault of the Brazilian cooperatives, but it demonstrates that organizing themselves into cooperatives is not enough to ensure participation. Although this design might still reflect the gendered expectation that women must assume the responsibility for cleaning up and taking care of their communities, HKS minimises this by placing women at the centre of the model's organisation from the beginning.

HKS, in contrast to waste banks in Indonesia, engenders greater labour inclusion but of a more demanding institutional nature. Women's participation may be facilitated by flexible community engagement, environmental education and recycling with a savings-oriented approach, such as may be found in waste

banks. This can have a socially empowering effect as networks are being created and environmental literacy is promoted, yet participation may not be full-time. In contrast, HKS needs to be scheduled for services, fees need to be collected, routes need to be managed, and segregated waste needs to be physically collected, resulting in greater public awareness and more demanding labour requirements.

SWaCH offers an educational middle ground. The cooperative is said to be mainly made up of women and Dalit waste pickers, while the direct user-fee model is directly linked with women's empowerment and a better occupational identity. But SWaCH's approach to inclusion is based on labour rights, unionisation, and municipal partnership, not a state-driven women development mission. Thus, whereas there are some similarities, HKS also differs in the way that it integrates women's participation within a broader poverty alleviation and community development initiative, potentially providing it with greater social acceptance in environments where women's collective self-help groups exist.

Financial autonomy and livelihood generation

A key indicator for many women-led environmental programmes is whether they achieve financial autonomy. The importance of HKS is that it transforms the act of waste collection from a decentralised, unpaid or volunteer community service into a monetised one. The model is heavily dependent on user-fee that is collected from the households and the establishments and supplementary income can be generated by transferring sorted waste to legal downstream entities like Clean Kerala Company. That provides women workers a more transparent source of income as compared to awareness raising programmes or small scale collection of recyclables.

Recent quantified evidence points to the economic size of the model. According to state linked reports, during the period from April 2024 to February 2025, 35,214 members of the HKS in 4,438 units generated Rs 341 crore in user fees and Rs 7.8 crore in handing over sorted waste to Clean Kerala Company. When these amounts are divided by the members, the earning per user-fee is about Rs 96,840 per member in the eleven months, or Rs 8,800 per month. When added to this, the extra Rs 7.8 crore makes the average approximately Rs 99,055 per member of the period, or about Rs 9,000 per month. The unit level combined receipts are at the average of Rs 7.86 lakh over the same period.

These figures are not necessarily an indicator of net income. They do not cover transport costs or the cost of equipment or lost payments or the administrative labour which goes unrewarded at the local level or route size variations or operational differences. Nevertheless, they reveal that HKS is not an add-on activity in the Kudumbashree programme, but can be a significant livelihood platform. They also demonstrate the importance of service payments in enhancing income stability, and distinguish HKS from income regimes where income is largely reliant on the volatile markets for recyclables.

It is telling how different it is to SWaCH. SWaCH workers also generate direct income from user fees and selling of recyclables, and the cooperative model has been commended for the transparency and relationship to citizens. According to institutional materials the workers are not paid by the municipality, but recoup user fees from residents and retain ownership of recyclables. This can lead to greater value capture from materials than some publicly channelled systems, but greater income volatility, also to the politics of municipal agreements.

Waste picker cooperatives in Brazil can provide avenues for capturing the value of materials and organising collective enterprises, but the gender distribution of benefits is not always equal. Women can be intensely involved in sorting and in lower paid labour, and they can have less leadership roles or less recognition for what they do. Economic returns in Indonesia's waste banks tend to be more modest, with

researchers describing the income as a side income or as a supplement to the income. HKS thus exists in a unique middle ground: it provides more continuity of income than community recycling through volunteers or savings, but its income stream is nonetheless subject to payment discipline, local support, and institutional continuity.

Environmental effectiveness in decentralised systems

But environmental effectiveness requires not only citizen awareness, it also hinges on whether waste is channeled through an ongoing supply chain from waste generation to waste recovery or authorized disposal. In this aspect, HKS has done well as it has a household collection system in place, along with local sorting and downstream institutional linkage. Households submit segregated and cleaned non-biodegradable waste to HKS workers, who collect and sort it and pass it to formal agencies or facilities for further processing. This helps minimise the typical problems of decentralised waste systems, where source separation incentives are given without supply of regular collection or safe onward movement.

Official figures reflect the environmental size of HKS. Kerala's Local Self Government Department estimates that the model removes around 10,000 tonnes of inorganic waste every month. Also, the state-run reports state that the HKS units collected 50,190 tonnes of non-biodegradable waste from April 2024 to February 2025. Volumes like these indicate a great deal of redirection away from open dumping, roadside accumulating and environmentally damaging informal disposal methods, particularly in a state that has historically caused public concern and political pressure over issues of waste.

The waste bank model in Indonesia is an environmentally effective waste management approach that is more behavioural and educative. Research reports its contributions to household segregation, to the awareness of waste reduction, to recycling practices, and to community resilience. This can be very useful for building lasting citizen participation, and may have mixed environmental outcomes, depending on citywide collection and downstream processing. Cooperatives and SWaCH in Brazil also have a significant impact in material recovery and diversion, although its results are subject to the availability of municipal support, storage facilities, collection contracts and market conditions for secondary materials. The administrative anchoring is the source of HKS's environmental strength. Household compliance can be reinforced by public rules, local monitoring and larger scale sanitation campaigns, as it is connected to the local government and mission-based waste facilities. This is not a risk-free approach. If segregation is poor, or payment is not accepted or the frequency of collection decreases, or facilities are not adequate, the environmental chain can weaken quickly. In this regard, HKS exemplifies the potential and the vulnerability of decentralized waste governance – it functions well when social involvement and institutional arrangements are mutually supporting and mutually reinforcing on an ongoing basis.

Institutional challenges faced by Haritha Karma Sena units

Despite its strengths, HKS faces several institutional challenges that complicate both worker welfare and service effectiveness. A major issue is uneven income across local bodies. A district-level reality audit reported in 2021 found that many HKS members were earning very little, with some units in early or weakly functional areas earning nothing, while many others earned below Rs 4,000 per month and only stronger-performing local bodies crossed higher thresholds. This evidence is important because it shows that aggregate statewide success can mask highly uneven local outcomes.

A second challenge concerns the dependence on user-fee recovery. Because income is closely tied to direct household and establishment payments, workers may bear the burden of negotiating, persuading, or

chasing residents for fees. This can be socially draining, especially when the public does not fully recognise waste management as a paid service deserving routine expenditure. In effect, women workers may be required to mediate the contradiction between collective environmental benefit and individual reluctance to pay.

A third challenge relates to occupational dignity, protection, and stigma. Official narratives celebrate HKS members as green workers, but the continued need to stress dignity indicates that waste labour still occupies an ambivalent social position. Some case-study literature also points to concerns about health risks, irregular support, and the broader burden associated with low-status environmental work. Comparative evidence from gender and waste literature suggests that without stronger safety measures, social protection, and recognition, women-centred waste systems can reproduce exploitation under the language of empowerment.

A fourth challenge is infrastructural inconsistency. HKS depends on functional local sorting spaces, collection routes, transport support, material recovery facilities, and downstream agencies willing and able to receive waste. If any part of that chain fails, waste can accumulate, worker productivity can decline, and household trust can erode. This is particularly important for urban expansion because land scarcity, traffic congestion, and storage constraints can make decentralised logistics more difficult than in smaller settlements.

A fifth challenge concerns institutional ambiguity. HKS is framed both as a micro-enterprise and as a public sanitation mechanism. This hybrid identity gives the model flexibility, but it also raises questions about responsibility for equipment, compensation during disruptions, grievance redressal, and long-term labour protections. When states rely on community-based systems to deliver public goods at low cost, the line between empowerment and burden-shifting can become thin.

Quantitative summary of economic outcomes within the Kudumbashree framework

It is possible to give a brief economic summary of the available recent HKS data. Between April 2024 and February 2025, 35,214 members across 4,438 units have collected 50,190 tonnes of non-biodegradable waste and generated Rs 341 crore through user fees as well as an extra Rs 7.8 crore from delivering segregated waste to Clean Kerala Company. The same report highlights other forms of green-enterprise diversification: 223 cloth bag units and 540 paper bag units, indicating that waste management livelihoods are connected to a larger green-enterprise ecosystem of micro enterprises.

There are four indicative ratios which are analytically useful. First, in the 11-month period average waste handled per member was approximately 1.43 tonnes, and average waste handled per unit was approximately 11.31 tonnes. Second, the average user-fee earnings per member during the period amounted to approximately Rs 96,840; these earnings were brought up to approximately Rs 99,055 when user-fee income is adjusted for income from the handover. Third, this means an average of close to Rs 8800 per month through user revenues and approximately Rs 9000 per month inclusive of handover revenues. Fourth, the average direct receipts per unit were about Rs 7.86 lakh during the period.

There are three reasons why these numbers are significant. They demonstrate that HKS is working on a large scale within the workforce, as well as that women's environmental labour is monetised in a measurable way and that a significant portion of the revenue comes not merely from the sale of "recyclables" but also from services. The same numbers should not be interpreted, however, as a full livelihood assessment as they do not reflect the net take-home income, the local differences or the distribution of the income over members having different workloads and responsibilities. The next step is

therefore to move toward more transparent unit-level and worker-level income accounting that is connected to route size, payment recovery and cost burdens for research and policy purposes.

Transferability to urban areas in developing countries

One of the key policy questions posed by this case is the transferability of HKS. The model is obviously of international relevance as it shows how women's collective organisation can be combined with decentralised waste governance at a significant level. However it should not be viewed as an easy blue print to be replicated merely by allocating women's groups to collect waste. HKS is effective because it takes into account social organisation, administrative power, user-fee authority, local value chains and a broader mission-oriented governance context.

At least five institutional components seem to be required for transferring to urban areas in developing countries. The first is a strong, community-based or women's groups platform that can recruit, hold peers accountable, resolve conflicts, and have local legitimacy. The second type is municipal support that goes beyond the rhetoric, such as route allocation, recognition, enforcement of segregation norms and assistance in securing land or facilities. The third is a financing model that is socially acceptable, such as user fees, payments from the municipality or a mixed system which does not leave workers completely vulnerable to the risk of payment failure. The fourth is the decentralised sorting and aggregation infrastructure that is appropriate for dense neighbourhoods. The fifth is a reliable downstream system for transport, recycling and disposal to prevent secondary dumping as a result of local collection.

In larger metropolitan areas with weak governance structures, influential contractor networks, established informal recycling networks and high levels of informal settlements, transferability is more challenging. In this kind of context, new women-led waste systems can be in conflict with incumbent actors if designed for substitution instead of negotiated inclusion. The SWaCH experience is illustrative here in that it demonstrates how partnership with organised waste pickers can be a viable model if the identity of labour and roles of services are negotiated as a group. A transferable model, based on the principles of the HKS, in other countries would therefore require more robust labour relations agreements, urban logistics planning and the ability to link with the existing waste economy than is sometimes suggested by the rhetoric of community participation.

What is the most realistic way forward - it is not replication but adaptive translation. HKS could be especially relevant for secondary cities or medium-density urban regions where there are dynamic women's federations and decentralised local government structures. For large cities, a hybrid approach of HKS and SWaCH women's collectives might be necessary, with negotiated rights and value capture for workers, and negotiated rights for women. If it fails to adapt to the new context, the language of inclusive environmental governance can be used to mask poor infrastructure and low-paying jobs.

Conclusion

Haritha Karma Sena is one of the most interesting current cases of women-led decentralised waste governance in the global South. Its comparative strength is focusing on the integration of environmental service delivery with the collective organisation of women, public institutional support and a recognisable local livelihood framework through Kudumbashree. While very important to understand labour rights, waste value capture, and community mobilisation, SWaCH and the waste pickers in Brazil and Indonesia have weaker architecture of gender-intentional inclusion and territorialised service organisation than HKS.

The paper also indicates that the success of HKS can not be overstated. It relies on fee recovery, the effectiveness of the other local bodies, continuity in the infrastructure, social recognition, and the daily efforts of women who continue to work within an environment characterised by stigma and unequal support provision. While the economic and environmental value of aggregate income and collection figures is significant, it does not negate the importance of improved wage security, occupational protection, and institutional accountability.

The message to urban areas in developing countries is obvious. HKS is not a waste collection formula, but an institutional model of inclusive decentralised environmental governance that needs to be rebuilt by women's collectives, public authority, infrastructure, financing and recognition of labour. In places where such conditions can be brought together, HKS provides a compelling model for connecting women's empowerment, circular economy action and urban environmental success in a socially rooted and managerially implementable way.

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