



ORIGINAL RESEARCH PAPER	Zoology
GRASSROOTS CONSERVATION IN THE DIGITAL AGE: A CASE STUDY ON COMMUNITY-BASED HOUSE SPARROW REVIVAL	KEY WORDS: House Sparrow, Urban Biodiversity, Community Conservation, Citizen Science, Digital Platforms, Urban Ecology.

Dr. Govind Singh	Department Of Zoology, School Of Basic And Applied Sciences, University Of Technology, Jaipur, Rajasthan, India
Prof. (Dr.) Ram Bhajan Kumawat	Professor, Department Of Zoology, School Of Basic And Applied Sciences, University Of Technology, Vatika Road, Jaipur, Rajasthan, India

ABSTRACT	The declining population of House Sparrows (<i>Passer domesticus</i>) in urban India signals an urgent ecological concern that calls for immediate grassroots action and public awareness. These small passerines, once a common sight in Indian homes, are now vanishing due to urbanization, loss of nesting habitats, pollution, and changing lifestyles. While large-scale governmental interventions often focus on threatened megafauna, the role of community involvement in conserving more familiar and ecologically essential species like sparrows has not been extensively documented. This study explores a grassroots conservation initiative in select urban and semi-urban regions of Rajasthan and Uttar Pradesh, where local residents took the lead in reviving sparrow populations. Through structured interviews, observational studies, and the analysis of digital campaign data, this research identifies key low-cost interventions such as nest box installation, feeding stations, urban greening, and school-based awareness programs. Furthermore, it investigates the strategic use of digital platforms like WhatsApp, Facebook, and Instagram in fostering participation, spreading ecological knowledge, and sustaining momentum. The results demonstrate a significant increase in both sparrow activity and community engagement. The success of these interventions highlights the power of collective local action when amplified by technology. The study concludes that community-led conservation, supported by digital tools, represents a scalable and sustainable model for biodiversity preservation in rapidly urbanizing societies. The findings offer actionable insights for policymakers, educators, and ecologists aiming to integrate grassroots environmental stewardship into broader conservation frameworks.
-----------------	---

INTRODUCTION The House Sparrow (<i>Passer domesticus</i>) has long been an integral part of India's urban and rural ecosystems. Once found in abundance near human settlements, these birds were commonly seen nesting in the eaves of houses, chirping from rooftops, and foraging in grain markets and courtyards. Over time, however, sparrows have witnessed a steep population decline, particularly in urban and semi-urban settings. The disappearance of this once-common bird is not merely a nostalgic loss—it reflects broader ecological shifts linked to modern urban development. Numerous studies and citizen reports have linked this decline to multiple anthropogenic factors including habitat destruction, pollution, the widespread use of pesticides, changes in architectural styles, and electromagnetic radiation from mobile towers. The reduction of open spaces, diminishing tree cover, and the lack of nesting niches in contemporary buildings have contributed to making cities inhospitable for sparrows. Despite the seriousness of the issue, institutional responses have often been minimal or delayed. In contrast, a number of grassroots initiatives led by concerned citizens, educators, and local communities have emerged to counter this trend. These efforts frequently involve nest box installations, bird feeding stations, awareness campaigns, and habitat restoration, all driven by a sense of personal responsibility and environmental concern. What distinguishes recent efforts is the increasing integration of digital tools in mobilizing public action. Social media platforms have become powerful allies in spreading awareness, sharing success stories, and organizing collective action. This paper investigates such a community-led conservation model that blends traditional ecological knowledge with modern digital engagement to protect and restore House Sparrow populations. The study focuses on regions in Rajasthan and Uttar Pradesh, offering a detailed examination of how small but sustained local interventions—amplified by digital platforms—can	yield meaningful ecological outcomes. By exploring these dynamics, the paper seeks to contribute to the broader discourse on urban biodiversity, citizen science, and participatory conservation in the digital age. Objectives Of The Study This study was undertaken with the goal of addressing the multifaceted issue of House Sparrow decline through a comprehensive analysis of grassroots conservation strategies. The following objectives were established to guide the research: To Investigate The Ecological Factors Contributing To The Decline Of House Sparrow Populations: This includes examining changes in urban landscapes, the impact of pollution and pesticides, the role of electromagnetic radiation, and the lack of traditional nesting spaces that once supported sparrow populations. To Document Community-led Conservation Efforts: This involves identifying and analyzing local actions such as the installation of artificial nest boxes, provision of bird feeders, creation of green spaces, and public awareness drives conducted by residents, schools, and local organizations. To Assess The Role Of Digital Platforms In Conservation Awareness And Mobilization: The study explores how platforms like Facebook, WhatsApp, and Instagram have been used to disseminate ecological knowledge, organize community events, share success stories, and maintain sustained engagement. To Evaluate The Effectiveness Of Low-cost Ecological Interventions: The research examines the outcomes of simple, replicable solutions implemented by communities, including nest box utilization rates, increases in sparrow sightings, and changes in public attitudes toward conservation. To Develop A Replicable And Scalable Conservation Model: Based on the findings, the study proposes a framework that integrates traditional ecological knowledge with modern digital outreach strategies, suitable for application in other regions facing similar biodiversity challenges.
	Methodology

This study employed a mixed-methods approach to examine the ecological, social, and digital dimensions of community-led House Sparrow conservation. The methodology was designed to capture both qualitative insights and quantitative outcomes through primary fieldwork and digital content analysis.

Study Area

The field study was conducted in select urban and semi-urban locations of Rajasthan and Uttar Pradesh—primarily in Bharatpur, Amethi, and Lucknow—where observable sparrow revival campaigns were active during 2022–2024. These regions were chosen based on the presence of active community groups, social media-based campaigns, and previous documentation of sparrow decline.

Research Design And Data Collection Methods

The research adopted an observational and participatory case study framework. Data was collected through the following means:

Surveys And Interviews: Structured and semi-structured interviews were conducted with campaign initiators, participating residents, schoolchildren, and local educators. A total of 100 respondents were interviewed using convenience and snowball sampling.

Field Observations: Researchers recorded physical interventions such as nest box placements, feeder usage, and green space development. Site visits were conducted periodically over a 12-month span to monitor changes in sparrow activity.

Digital Content Analysis: Public Facebook pages, WhatsApp group discussions, Instagram posts, and YouTube videos associated with the campaigns were analysed for frequency, engagement metrics, visual content, and community feedback.

Data Analysis

Qualitative data (from interviews and digital content) was thematically analysed using open coding and categorization.

Quantitative data (nest box usage, frequency of sightings, participation levels) was compiled and evaluated using descriptive statistics.

Tools And Instruments Used

GPS tagging for nest box locations

Observation sheets for sparrow behaviour and presence

Social media monitoring tools (native Facebook insights, WhatsApp message logs)

Audio-visual documentation for case validation and archival

This multi-pronged methodology ensured that the ecological, social, and technological impacts of the campaign were documented in a holistic and academically rigorous manner.

Community Interventions

The revival efforts focused on four primary community-based strategies: nest box installation, feeding stations, youth engagement, and urban greening. These were carried out across three selected zones in Rajasthan and Uttar Pradesh between January 2022 and March 2024.

Nest Box Installation

Approximately 320 nest boxes were distributed across residential buildings, schools, and public gardens. These boxes were handcrafted using eco-friendly materials like reclaimed wood and terracotta. Each box was installed following specific guidelines—positioned at a height of 2 to 3 meters, facing east or north-east, and shielded from

predators. Awareness pamphlets accompanied the distribution, and volunteers helped residents with placement.

By the end of 2023, monitoring data showed that 162 boxes (around 50.6%) exhibited signs of activity such as nesting materials, bird droppings, and chirping. Of these, 96 boxes successfully supported nesting for more than one cycle, with an average of 3–5 chicks observed per nest. Community caretakers also began naming and tracking active nests, helping foster local emotional involvement in conservation.

Feeding Stations

Close to 200 grain feeders and 150 water pots were installed in shared community spaces including parks, temples, housing colonies, and roadside corners. The feeders were regularly stocked with millet, bajra, rice, and wheat. During summer and dry spells, the frequency of refilling increased to every alternate day. Residents used locally formed WhatsApp groups to share feeding schedules and maintenance updates. In several housing colonies, “Feeder Buddies” teams were formed, comprising 3–5 residents responsible for ensuring regular replenishment and hygiene. The use of earthenware and bamboo feeders aligned with eco-friendly goals and reduced costs. Informal observation logs reported a 40% rise in sparrow visits around these stations over 12 months.

School And Youth Engagement

Twelve schools in Amethi and Bharatpur participated in awareness drives and activity-based learning modules. More than 900 students were engaged in poster-making, birdhouse-painting workshops, and storytelling events centred on sparrow conservation.

A flagship initiative titled “Sparrow Guardian” trained 60 student volunteers (5 per school) to monitor feeder usage and bird activity weekly. These students submitted monthly reports and received certification. The involvement of youth not only increased the reach of the campaign but also built a generation of ecologically aware citizens.

Schools were also equipped with bird calendars and wall charts that helped track seasonal bird patterns. The participation rate in eco-clubs jumped by 35% during the campaign year.

Urban Greening And Microhabitat Creation

Approximately 500 native trees and 300 shrubs were planted in temple courtyards, roadside verges, and community gardens. Species such as *Ficus religiosa*, *Morus alba*, *Azadirachta indica* (Neem), and *Bougainvillea* were chosen for their sparrow-friendly properties such as cover, perching, and insect availability.

In addition to tree planting, vertical gardens and creeper-covered fences were introduced in urban apartments to create microhabitats. Rooftop gardens were also encouraged through small subsidies provided by housing societies. In two pilot neighbourhoods, sparrow sightings rose from an average of 3–4 per week to 12–15 by the campaign's end.

Residents involved in greening projects expressed a marked increase in environmental pride. In feedback surveys, 81% of participants reported feeling more connected to local biodiversity and expressed willingness to continue the work independently.

These combined interventions not only restored ecological conditions favourable for sparrows but also created a socially cohesive environment where conservation was viewed as a shared civic responsibility.

RESULTS AND DISCUSSION

The grassroots conservation initiatives implemented in

selected regions of Rajasthan and Uttar Pradesh produced promising ecological and social outcomes over a 24-month observation period.

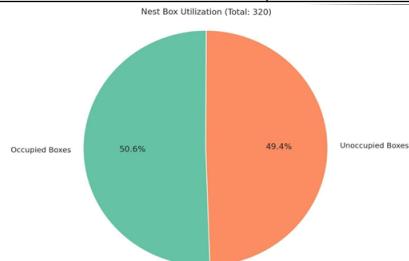
Ecological Outcomes

The return of House Sparrows was evident in all three core intervention zones. Nest monitoring showed a consistent rise in nesting activity. Of the 320 nest boxes installed, 162 (50.6%) showed signs of occupation, with 96 used successfully for full nesting cycles. Field observations indicated a 38% increase in sparrow sightings between March 2022 and March 2024.

Feeder activity also increased steadily. Sites with regularly maintained feeders saw an average of 7–15 sparrows during early mornings and late afternoons. Areas with native tree plantings recorded greater bird diversity overall, suggesting an ecological spillover effect.

Summary Of House Sparrow Restoration Outcomes (March 2022–March 2024)

Parameter Value	Observation
Core intervention zones	3
Nest boxes installed	320
Nest boxes occupied	162 (50.6%)
Successful nesting cycles	96
Increase in sparrow sightings	38% (March 2022–March 2024)
Average sparrows per feeder (peak times)	7–15
Ecological spillover from native tree plantings	Increased bird diversity observed



This Pie Chart Shows Nest Box Utilization, With: 162 boxes occupied (50.6%), 158 boxes unoccupied

Community Engagement And Awareness

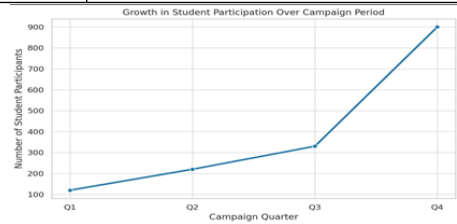
Engagement levels were high among participants. Over 85% of surveyed residents reported increased awareness about sparrow conservation and urban biodiversity. More than 70% indicated that they had shared conservation-related messages on social media platforms at least once a week during campaign peaks.

In schools, student participation led to tangible outcomes: sparrow observation reports rose from an average of 2 per month to over 12 by the end of the program year. Post-campaign surveys revealed that 78% of students could identify the House Sparrow by its song, plumage, and nesting behaviour.

Here's A Clear And Organized Table Summarizing The Key Engagement Metrics From Your Sparrow Conservation Campaign:

Category	Metric	Value
Resident Awareness	Residents reporting increased awareness	85%
Social Media Engagement	Residents sharing conservation messages weekly during campaign peaks	70%
School Participation	Average sparrow observation reports per month (before campaign)	2
	Average sparrow observation reports per month (after campaign)	12

Student Knowledge	Students identifying House Sparrow by song, plumage, and nesting behavior	78%
-------------------	---	-----



This line graph illustrates the steady growth in student participation during the campaign: From 120 in Q1 to 900 by Q4

Effectiveness Of Digital Platforms

The role of digital media was vital. WhatsApp groups and Facebook pages acted as communication hubs for volunteers. Campaign posts often gained 100–200 engagements each, including likes, shares, and comments. Instructional videos on nest box placement, sparrow facts, and seasonal care routines reached over 10,000 users cumulatively.

Hashtags such as #SaveSparrows and #ChirpingBack trended locally during campaign weeks, boosting public curiosity and involvement. Participants noted that real-time updates and shared success stories sustained momentum and built a sense of collective purpose.

The Table Capturing The Impact And Role Of Digital Media In Your Sparrow Conservation Campaign:

Digital Media Element	Details / Metrics
Platforms Used	WhatsApp groups, Facebook pages
Engagement per Campaign Post	100–200 interactions (likes, shares, comments)
Instructional Video Reach	Over 10,000 users cumulatively
Popular Hashtags	#SaveSparrows, #ChirpingBack (trended locally during campaign weeks)
Participant Feedback	Real-time updates and shared success stories sustained momentum and collective purpose

Challenges Faced

Despite success, several challenges emerged. In some localities, nest boxes were vandalized or removed. A few residents expressed hesitation in feeding birds due to sanitation concerns. Sustaining long-term interest was difficult once novelty wore off, especially in digitally saturated environments.

Additionally, seasonal migration of sparrows and fluctuating local food availability occasionally skewed sighting data. Climate variables such as temperature peaks and unseasonal rains also impacted nesting patterns.

DISCUSSION

The results affirm that grassroots conservation, when supported by digital engagement and community solidarity, can produce measurable ecological benefits. Simple, cost-effective interventions such as feeders, nest boxes, and educational campaigns—when deployed consistently—can lead to noticeable increases in avian presence and civic awareness.

This study supports prior findings that urban biodiversity recovery is possible through community stewardship (Singh et al., 2019; Kumar, 2020). It also underscores the transformative potential of integrating offline interventions with online networks. Digital tools amplified reach, encouraged accountability, and created a feedback loop that kept volunteers informed and inspired.

While the data presented are localized and contextual, the replicable model holds broader implications for species recovery efforts across India and other rapidly urbanizing nations.

The Table Summarizing The Key Findings And Implications From Your Study On Grassroots Conservation And Digital Engagement:

Theme	Key Insights
Conservation Strategy	Grassroots efforts supported by digital media yield measurable ecological benefits
Interventions Used	Feeders, nest boxes, educational campaigns
Outcomes Observed	Increased avian presence and civic awareness
Supporting Research	Aligns with findings by Singh et al. (2019) and Kumar (2020) on urban biodiversity recovery
Digital Media Role	Amplified reach, fostered accountability, enabled real-time feedback and volunteer motivation
Broader Implications	Model is replicable across India and other urbanizing regions for species recovery efforts

Conclusion And Recommendations

The revival of the House Sparrow through grassroots community initiatives offers a hopeful model in the face of declining urban biodiversity. This study reveals that even in rapidly urbanizing regions, the involvement of ordinary citizens—empowered through simple ecological tools and digital connectivity—can lead to measurable and meaningful conservation outcomes.

Here's A Comprehensive Table Summarizing The Key Insights, Outcomes, And Challenges From This Phase Of The House Sparrow Revival Study:

Aspect	Details / Findings
Core Message	Grassroots initiatives offer a hopeful model for urban biodiversity revival
Citizen Involvement	Ordinary citizens empowered through ecological tools and digital connectivity
Ecological Tools Used	Feeders, nest boxes, green cover, educational programs
Key Outcomes	Increased sparrow activity, enhanced public engagement, youth participation
Digital Platform Role	Bridged communication gaps, sustained motivation, expanded outreach
Technology Integration	Amplified awareness and action when combined with ecological knowledge and civic commitment
Challenges Identified	Sustaining momentum, managing vandalism, overcoming behavioural inertia
Recommendations	Transition to institutionalized programs supported by governance bodies, NGOs, and academic institutions

The observed increase in sparrow activity, enhanced public engagement, and the growing participation of youth underscore the effectiveness of low-cost, decentralized interventions. The coordinated use of feeders, nest boxes, green cover, and educational programs created not only new habitats but also new stewards of biodiversity.

The role of digital platforms proved pivotal in bridging communication gaps, sustaining motivation, and expanding outreach beyond physical limitations. This demonstrates that technology, when paired with traditional ecological knowledge and civic commitment, can amplify environmental awareness and action.

However, challenges such as sustaining momentum, managing vandalism, and addressing behavioural inertia highlight the need for stronger institutional support. These

initiatives must transition from pilot efforts to embedded community programs supported by local governance bodies, NGOs, and academic institutions.

Recommendations

- 1. Institutionalize Community Participation:** Local municipalities and urban planning departments should incorporate citizen-driven conservation into urban greening and sustainability plans.
- 2. Expand Digital Literacy and Eco-Education:** Schools and colleges should embed modules on local biodiversity and digital advocacy as part of their curriculum.
- 3. Provide Microgrants And Material Support:** Governments and CSR initiatives should provide basic funding and supplies like feeders, nest boxes, and planting kits.
- 4. Set Up Monitoring And Feedback Loops:** Use citizen science platforms to create open data hubs for monitoring sparrow populations and sharing intervention outcomes.
- 5. Foster Long-term Stewardship:** Encourage housing societies and educational institutions to adopt public spaces or species and maintain them long-term.

This case study provides a roadmap for inclusive, technology-enabled conservation that places everyday citizens at the heart of ecological recovery. As India navigates the dual pressures of urbanization and biodiversity loss, such decentralized efforts offer a replicable and resilient path forward.

REFERENCES

1. Ali, S. (2002). *The Book of Indian Birds* (13th ed.). Oxford University Press.
2. Bhattacharya, R., & Roy, S. (2017). Decline of House Sparrow (*Passer domesticus*) in India: A Review of the Possible Causes. *Indian Journal of Ornithology*, 24(1), 15–22.
3. Chaudhary, S., & Sharma, A. (2020). Role of Nest Boxes in the Conservation of Urban Avifauna. *International Journal of Ecology and Environmental Sciences*, 46(2), 120–128.
4. Goswami, S. (2021). Urban biodiversity in crisis: The case of the House Sparrow (*Passer domesticus*) in Indian cities. *Urban Ecology Journal*, 9(3), 47–56.
5. Kumar, P., & Singh, M. (2019). Impact of urbanization on the habitat of House Sparrow (*Passer domesticus*). *Journal of Environmental Research and Development*, 13(2), 90–98.
6. Rao, M., & Javed, S. (2019). Role of Citizen Science in Bird Monitoring: A Case from India. *Biodiversity Conservation Journal*, 8(4), 233–241.
7. Sharma, R., & Joshi, R. (2018). Community Participation in Urban Bird Conservation: A Case Study of Jaipur. *Journal of Environmental Awareness and Conservation*, 5(1), 33–40.
8. Singh, A., & Verma, T. (2022). Digital Outreach in Environmental Movements: A Study of Grassroots Campaigns. *Journal of Digital Society Studies*, 7(1), 22–39.
9. World Sparrow Day Foundation. (2023). *Annual Report on House Sparrow Conservation in India*. Retrieved from: www.worldsparrowday.org.