

‘COMMUNITY-LED TREE CENSUS’

A Guidebook for Local Action

AIWASI

Australia India Water Security Initiative

About Australia-India Water Security Initiative (AIWASI)

The Australia-India Water Security Initiative (AIWASI) is a pioneering collaboration designed to adapt and apply successful approaches to water security, climate resilience, and urban liveability from the Australian context to Indian cities, with Delhi serving as the demonstration testbed. Anchored in the principles of Water Sensitive Cities (WSC) and Gender Equality, Disability, and Social Inclusion (GEDSI), AIWASI functions as a living laboratory, showcasing how community-driven solutions can address the complex water and environmental challenges of urban India. The initiative has been piloted in two diverse and underserved communities in Delhi - Mubarakpur Dabas and Bakkarwala, where it promotes integrated, inclusive, and resilient approaches to local water management and collaborative governance.

AIWASI was conceived as a “living laboratory”: a space where innovative solutions are tested and adapted in real-time with the community. It combined technical innovation with deep community engagement, creating a replicable model for integrated urban water and environmental management. At the core of this model is the belief that sustainable change must emerge from co-created processes, where local knowledge, lived experiences, and community aspirations are treated with equal value.

The Australia-India Water Security Initiative (AIWASI), supported by the Department of Foreign Affairs and Trade (DFAT), Australia, is being implemented by a consortium led by the World Resources Institute (WRI) India, in collaboration with McGregor Coxall (McGC), the National Institute of Urban Affairs (NIUA), and the Mahila Housing SEWA Trust (MHT).

About Australia-India Water Security Initiative (AIWASI)

Among the core implementing partners, NIUA has played a pivotal role in strengthening urban governance frameworks, institutional capacity, and community participation mechanisms to ensure the long-term sustainability of water-sensitive interventions.

A key contribution by NIUA has been the establishment of the Delhi Water Forum, a city-level, multi-stakeholder platform bringing together representatives from government departments, academic institutions, civil society organisations, and technical experts. This forum has been acting as an idea-exchange platform, ensuring alignment between city-wide water management strategies and on-ground actions.

At the neighbourhood level, NIUA also supported the formation of Community Water Forums (CWFs) in the two demonstration sites—Bakkarwala Resettlement Colony and Mubarakpur Dabas Urban Village. These forums serve as inclusive, representative platforms that empower community members, especially women, youth, and marginalised groups to:

- Identify and articulate their water and environmental priorities;
- Actively participate in the planning, design, and monitoring of local interventions;
- Interface directly with municipal authorities, project teams, and technical experts;
- Foster a sense of collective ownership and shared responsibility for the upkeep and enhancement of public infrastructure and green spaces.

Together, the Delhi Water Forum and Community Water Forums establish a governance continuum from city to community to deepen awareness of city and local level water management and cultivate a sense of shared responsibility.

About The Guidebook

This guidebook emerges from a shared need for environmental assessment, voiced at both the city and community levels through structured discussions within the Delhi Water Forum and Community Water Forums (CWFs) in two AIWASI demonstration sites: Bakkarwala Resettlement Colony and Mubarakpur Dabas Urban Village. In both communities, residents identified a significant lack of green cover and trees in their neighbourhoods, reinforcing the urgency for localised action.

In Bakkarwala, while neighbourhood and pocket parks exist, the internal streets and open spaces remain largely devoid of tree cover, exacerbating residents' exposure to urban heat island effects and severe air pollution. This observation, raised repeatedly during CWF meetings, laid the foundation for a grassroots initiative to map and understand existing tree cover through a community-led tree census.

In Mubarakpur Dabas, once characterised by dense tree-lined lanes, the changing land use patterns, combined with persistent waterlogging in certain low-lying areas, have contributed to a steep decline in tree survival and overall green cover. Community members expressed concern over this ecological degradation, prompting a similar interest in systematically documenting their local tree assets.

Recognising that any meaningful engagement with government authorities would require evidence-based dialogue, both communities undertook a participatory tree census to assess and map their existing green infrastructure. The activity was conducted with active involvement from trained local volunteers, supported by project partners. The preliminary results were shared with the Municipal Corporation of Delhi (MCD) Horticulture Department, which acknowledged the value of this initiative and expressed interest in replicating it in other neighbourhoods across the city.

As a result, this guidebook has been developed as a replicable and practical resource for government officials, civil society organisations, and community representatives seeking to implement similar tree census exercises in other areas.

The guidebook provides a step-by-step framework for conducting a community-led tree census, covering:

- Easy-to-use digital and manual tools for data collection,
- Strategies for community sensitisation and training,
- Methods for field-level implementation and monitoring,
- Approaches for integrating data into planning and advocacy processes.

Drawing from the lived experiences of Bakkarwala and Mubarakpur Dabas, the guidebook offers a participatory model that not only generates valuable ecological data but also empowers communities to become active custodians of their local environment. By documenting methods, learnings, and outcomes, this guidebook aims to foster ecological resilience, environmental stewardship, and more inclusive decision-making in urban neighbourhoods.



What is a Tree Census and Why is it Needed?

A tree census involves systematically documenting the trees in a specific area, including its species, location, size, health, and ecological functions. Conducting such a census is essential for:

- Understanding the existing green cover
- Identifying gaps in plantation
- Planning water-sensitive and climate-resilient urban landscapes
- Informing public policy and plantation strategies
- Strengthening community ownership of local environmental resources

Relationship of Tree Census with Water Sensitivity

Tree census activities help communities recognise how trees regulate the local water cycle by reducing surface runoff, improving infiltration, and shading water bodies to reduce evaporation. Selecting native, drought-resistant species contributes to conserving water and managing urban heat islands. In both Bakkarwala and Mubarakpur Dabas, the initiative successfully linked ecological literacy with water sensitivity by embedding tree documentation within broader water-focused urban planning efforts.

Organizations Involved for Conducting a Tree Census

The community-led model is collaborative by nature. The following stakeholders typically take part:

- Local government departments: MCD (Horticulture), DDA, DJB
- Academic and technical institutions: NIUA, WRI, McGregor Coxall
- Community-based organizations: MHT, local NGOs
- Community residents and volunteers: Enumerators, forum members
- Donor and policy partners: DFAT, MoHUA under AIWASI

Tree Census Parameters

The key parameters collected during the census include:

- Species name (local and scientific)
- Height and girth
- Canopy size
- Health condition (healthy, diseased, dead)
- Tree function (e.g., shade, fruit-bearing, ornamental)
- Ecological role (e.g., animal habitat)
- Social role (e.g., religious, play areas, vendor shelters)
- Location type (roadside, park, private land)
- Geo-tag coordinates
- Ownership (public, private, government)

Understanding a Community-led Model for Conducting Tree Census

A community-led tree census builds on the strengths and knowledge of local residents. Unlike top-down surveys, this participatory approach includes:

- Training community members in species identification and mobile data collection
- Establishing local forums (like the Community Water Forums) for planning and feedback
- Integrating traditional wisdom with scientific methods
- Enabling residents to co-create plantation strategies
- Building stewardship for long-term tree maintenance

This model ensures sustainability by aligning ecological goals with social cohesion and local ownership.

Process to Conduct a Community-led Tree Census

Creating an Enabling Environment for Conducting a Community-led Tree Census

Before initiating any tree census, it is essential to foster a supportive ecosystem among stakeholders. This includes identifying nodal authorities (e.g., municipal horticulture departments), mobilising community leaders, and building partnerships with technical experts. An enabling environment also means acknowledging the community's right to participate in shaping their green spaces, especially in dense urban or resettlement contexts. Building mutual trust is the foundation for long-term collaboration.

Sensitizing the Community

Community awareness is the cornerstone of participatory work. Sensitisation sessions through street meetings, WhatsApp groups, and local workshops should explain the importance of trees for air quality, temperature control, biodiversity, and water conservation. In Bakkarwala, sessions emphasised how green spaces support livelihoods (e.g., vendor shade) and well-being (e.g., children's play), which helped personalise environmental concerns. Officials from the horticulture department were also invited to explain the ecological functions and maintenance needs of native trees.

Developing a Dissemination Strategy

To keep stakeholders engaged and informed:

- Distribute posters, flyers, or digital infographics in local languages.
- Use community WhatsApp groups to share census updates and answer questions.
- Invite local influencers or respected residents to speak about the initiative.
- Provide regular visual feedback through charts, maps, or photos showing progress.

Stages of Conducting the Community-led Tree Census Activity

1) Understanding the Neighbourhood

Before enumeration, a basic understanding of the local context is necessary. This includes:

- Mapping neighbourhood blocks
- Identifying existing green patches and built-up areas
- Observing patterns of public use of green spaces (e.g., parks, temples, roadside trees)
- Understanding socio-cultural relationships with trees (e.g., sacred trees, fruit trees)

This phase helped planners in both neighbourhoods design context-specific plantation strategies.

2) Collaborating with Local Authorities

Government officials play a vital role in ensuring technical accuracy and legitimacy of the data.

Collaboration includes:

- Appointing a nodal officer from the horticulture or forest department
- Finalising census parameters and classification
- Sharing plantation priorities and existing urban greening plans
- Validating findings through site visits

Their involvement, as seen in Bakkarwala, helped streamline data collection and future implementation.

3) Preparing a Local Tree Inventory

The inventory process included:

- Training community members in tree identification
- Using a mobile application (e.g., Memento database) to geo-tag and record details
- Documenting species, height, girth, canopy, health, and location
- Verifying duplicate entries with assigned block-wise enumerators

In Mubarakpur, tree tags and QR codes were used to avoid double counting and promote accuracy.

4) Developing a Digital Tool

A mobile-based digital tool ensures standardized, scalable, and accessible data collection. The tool should be:

- Easy to use with local language labels
- Configured for offline use
- Capable of capturing key parameters and geo-tagged photos
- Customizable to fit site-specific needs

Pilot testing was done in both neighbourhoods to refine the interface and train users.

5) Identifying the Core Working Group

The core group is responsible for coordinating the activity and includes:

- Moderators or facilitators to guide each neighbourhood block
- Community enumerators, ideally youth or women familiar with the area
- Local coordinators to troubleshoot app issues and help with logistics

This decentralised model, used in both locations, ensured wide coverage and local accountability.

6) Procuring the Activity Material

Basic materials for tree census include:

- Measuring tape (for height and girth)
- Tree tags or QR code stickers
- Chalk or markers
- Clipboards or notebooks (if tech fails)
- Water and refreshments for volunteers

These activity kits were essential to ensure that community members felt supported during the data collection process.

7) Community Engagement

Regular sessions help build knowledge and motivation:

- Orientation on tree functions and water links
- Hands-on training with sample trees
- Role-play to practice enumeration in small groups

Special attention should be given to make it gender-inclusive and intergenerational. In Bakkarwala, nearly 80% of the active participants were women.

8) Conducting a Pilot Within the Community

A pilot is useful to:

- Test the app and parameters
- Refine the team structure and logistics
- Identify confusion in species identification
- Gather early feedback from participants

In both neighbourhoods, pilots ensured smoother main census roll-outs

9) Conducting the Tree Census Activity

The full-scale activity should be:

- Conducted in blocks or zones
- Scheduled in short daily sessions to avoid fatigue
- Monitored by moderators and supported by experts when needed

Community members often conducted the survey during their leisure hours, allowing for flexible participation.

10) Validating and Analysing the Data

Data validation includes:

- Cross-verifying with satellite maps or Google Earth
- Reviewing anomalies (e.g., wrong species names or duplicate entries)
- Tagging trees with high ecological or cultural significance

This analysis helps generate spatial maps and identify priority areas for plantation.

11) Conducting a Session for Reimagining the Plantation with Community Members

Once data is validated, organise a Plantation Re-imagination Workshop. Use printed maps and community data to:

- Mark vacant areas or low-tree-density zones
- Suggest preferred species
- Discuss needs for protection (tree guards, fencing)
- Integrate maintenance ideas like watering rotations

This step ensures local ownership of the plantation strategy.

12) Preparing a Plantation Strategy for the Community

Using census findings and community inputs, co-develop a plan that includes:

- Proposed species (with ecological and social value)
- Planting zones (parks, roadsides, schools, community spaces)
- Maintenance plan (with roles for MCD and residents)
- Monitoring mechanism (seasonal review, mobile app tracking)

Bakkarwala Community-led Tree Census

The community-led tree census in Bakkarwala was conducted between May 2023 and December 2024 as part of the Bakkarwala Water Forum under the AIWASI project. Located in a dense resettlement colony in West Delhi, Bakkarwala faces limited green spaces and high vulnerability to heat stress and water scarcity. The census aimed to assess the existing tree cover and engage the community in building a green and climate-sensitive neighbourhood. The initiative was unique in its inclusive nature as women formed nearly 80% of the participants, actively documenting trees and learning to use a mobile application (Memento database) to record species, size, health, and location.

The process began with awareness sessions and block-wise team formations, followed by a pilot test and full-scale enumeration. A total of 24 tree species were recorded, with Neem, Peepal, Saptparni, and Jamun being the most common. Most trees were found along roadsides, and over 97% were healthy. Community members also recorded how trees served multiple roles in the neighbourhood as shade for vendors, sites for religious offerings, and shelters for birds and insects. The initiative built local knowledge about invasive species, native trees, and the role of greenery in water conservation.

After the data was validated and analysed, a plantation strategy was co-developed through a focus group discussion with residents and horticulture officials. Residents identified low tree density zones using printed maps and proposed planting native and fruit-bearing trees. The Municipal Corporation of Delhi (MCD) supported this effort by conducting a plantation drive in July 2024, where over 100 saplings were planted in parks and along roadsides. This experience demonstrated how communities can take ownership of environmental planning, combining local knowledge with digital tools to build resilient and inclusive green spaces.

Mubarakpur Dabas Community-led Tree Census

The tree census in Mubarakpur Dabas, carried out between January 2022 and February 2025, was initiated under the Mubarakpur Water Forum to address the area's declining green cover and increasing urbanisation. As an urban village, Mubarakpur Dabas has witnessed rapid transformation and ecological stress, especially around water availability. Through awareness-building sessions and community mobilisation, residents especially women, elders, and youth were trained to identify trees and collect data using a mobile-based digital tool. The process encouraged participation across all blocks and drew on local ecological knowledge and lived experience.

The census recorded 24 species, including Neem, Jamun, Pilkhan, and Peepal. Unlike Bakkarwala, a notable portion of trees about 25% were found to be dead, dried, or diseased, especially in parks and neglected open areas. Community members also noted the presence of invasive species such as Vilayati Keekar. Using geo-tagged data and printed maps, residents identified areas in need of greening and shared insights about tree use many trees supported religious practices, local markets, or served as informal public spaces. The process was empowering, particularly for women who led documentation efforts and shared findings within their neighbourhoods.

In February 2025, residents participated in a plantation reimagining session where they proposed new planting sites and suitable native species. Community suggestions included protective measures like fencing and regular watering to ensure sapling survival. The final plantation plan prioritised fruit-bearing and shade-providing species such as Jamun, Lemon, and Mango. The experience strengthened local ecological awareness and built a foundation for long-term collaboration between the community and government bodies. It highlighted how even small, informal settlements can lead effective environmental action when supported with training, tools, and recognition.

