Department of Local Government, Punjab

Urban Greening and Tree Plantation Strategy & Guidelines

ABSTRACT

This is a guidance document for the Urban Local Bodies for ensuring effective outcomes while undertaking plantation and tree protection action plans and bringing technology to measure the outcomes of the urban greening initiatives.

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I. Introduction and Background

Growing trees and undertaking planned plantation drives presents a significant environmental and economic opportunity in Punjab. With effective and planned urban greening programmes our cities have a huge opportunity to contribute in adopting climate sustainable urbanization in Punjab.

This strategy paper is drafted as guideline for Urban Local Bodies (ULBs) for undertaking future plantation interventions in their respective ULB areas to not only ensure greening of cities and towns but also to maintain and strengthen the existing green cover. This strategy paper builds on the earlier urban greening guidelines, 2014 published by Ministry of Housing and Urban Affairs (MoHUA) and takes notes of the best practices prescribed by the Horticulture department.

Apart from promoting sustainable tree plantation guidelines, this strategy paper also includes using Geo-spatial and IT based enabling mapping tools to conduct both Tree census survey and plotting of the plantation efforts on maps to bring right evidence in measure success in terms of green cover growth, monitoring tree and plantation sustenance over the cycles of plantations in each ULBs across seasons.

II. Objectives

There are several challenges that impede implementation of plantation and greening initiatives, including lack of quality planting material; technical capacity and knowledge gaps; finance gaps; and inadequate attention to issues around land and tree tenure etc. Hence, the strategy paper here was drafted keeping following objectives in mind as ULBs endeavored on their plantation drive this year:

- Strategically Identify and prioritize targeted Tree plantation drives within urban areas: (a) experiencing highest heat stress zones with large vulnerable populations; (b) in available government lands; (c) along existing natural streams (edge stabilization and erosion control) and green zones (expand vegetated areas); (d) in areas with higher air pollution
- Planning for and implementing adequate pre-plantation and post-plantation measures
- Ensuring sustenance and adopting right variety of trees (native) and plantation
- Correctly accounts all the tree plantation and monitor the progress of plantation over the time using technology platforms.
- Protection and safeguarding of existing trees and greens

III. Plantation/Greening Action plan

It's recommended for every ULB to come-up with an advanced Annual plantation / greening action plan for their jurisdictions. This document will be a succinct set of actions and includes estimates of tree targets to be planted on sites pre-selected for plantation drive. The year wise action plan would guide the ULB on creating an advanced budget which needs to be set out for carrying out both new plantation drives and covering for operational expenditures for existing greens. The action plan should include details for follow key aspects:

- Identification of the plantation stretches with accurate estimate of land size, location, ownership status
- Identification of nursery (micro-nurseries) area and preparation of nurseries in joint cooperation with forest departments / CSR / community partners.
- Calendar and scheduling timelines for – soil preparation, construction and clearance of sites from decay plantation/debris/ construction wastes etc.
- Operation and Maintenance estimates for minimum three years (watering, pruning, manpower cost, etc.), year-end annual reporting of survival rate for plantation
- Greening Committee – to implement, regularly monitor and coordination a short committee should be instituted with representative from - ULB, Forest department, horticulture/landscaping specialist – academic institution (if possible), one elected member nominated by house, CSR partners (if any) and this committee should be headed by Municipal commissioner.

Based on the guidelines issued earlier by Department of Local Government (DoLG) vide letter no: CE(IT) - 2017/1313-29 dated 25/07/2017, the plantation targets for each ULB are set as following and regular monitoring would be done over the online dashboard:

ULB Category	Annual Plantation Target	Total Trees
All Municipal Corporation (13nos)	Minimum 5000 each	65,000
Class I MCs (27 nos)	Minimum 2500	67,500
Class II MCs (51 nos)	Minimum 1500	76,500
Class III MCs (23 nos)	Minimum 500	11,500
Minimum Total Annual Target		**220,500**

IV. Urban plantations – planning process

a) Tree species selection guidelines

The most common use of trees is on urban roads and avenues apart from the guarded compounds which include mostly public buildings and institutional lands which have open green spaces as reservations under the building norms. Hence, it is necessary to lay down certain criteria before undertaking any plantation drive for such public realm areas. The selection process of tree species shortlisting should include:

- Indigenous / native variety tree which should suit the soil and climatic conditions
- Shortlisted species should be hardy, robust and shouldn't need continued support once its achieved sustenance age after plantation
- Preferably should have long life term (more than 20 years)
- The species must be either evergreen or nearly evergreen during the extreme summer season
- Fast growing and resilient to common pest attacks
- Deep rooted trees should be preferred, however, this should be avoided for pavements designs
- Easy transplantation should be possible
- To increase biodiversity or help food security in an area, high nutrition value trees (fruit trees, moringa) can be considered particularly in mixed or group plantation opportunities

b) Area selection for Plantation guidelines

Selection of sites for plantation of trees is the most critical decision for ensuring both sustenance and safety of the tree as well as public space. At many occasions, due to rampant paving and impervious side walk planning and design the existing plantation suffers growth due to lack of air and water causing damage to the tilling and pavement strength. Hence following plantation guidelines should be kept in mind while making selection of sites:

- Enclosed compounds public buildings/ complexes – identify such government owned premises which are well compounded with walls and have sufficient space for organizing plantation drive.
- Public parks and gardens
- Vacant Municipal land
- Reservation land for future expansion of road
- All vacant areas in notified slum sites where land titles have been awarded in ULBs
- Water bodies and sidewalks along the rejuvenated ponds
- Avenue plantation along the sidewalks
- Along the rotary junctions and important intersections – for flowering and mixed plantation selection of different varieties of trees and creating aesthetic and place making impact.
- Avenues and plazas along pedestrian corridors of parking sites – markets, community centers, neighborhood commercial sites.
- Public / institutional buildings – Education (schools, etc), hospitals, Health centers, community centers etc.
- Along the boundaries of public utility / service facilities – WTP, STP, GVPS, re-claimed land-fill sites, Material recovery facility (MRF), compost pit sites, cremation grounds
- Heritage building and structures of historic importance

c) Site preparation

To create a favorable environment for ensuring the vegetation to thrive, it's important to consider few key tasks before plantation.

- Assessing soil quality and amendment of soil for better vegetation growth
- Grading of the soil to prevent waterlogging
- Plan for suitable irrigation system to water the planted trees until they are established
- Removal of weed and pest control (preferably using non-chemical, natural methods)
- Appropriate timing and season for planting (per species) for better growth (planning right before the monsoons or during irrigation period will ensure water availability, thereby increasing the chance of survival for the trees)

d) Tree Planting guidelines

While the plantation can be classified broadly in 3 types – avenue, group and Mixed plantation types. Mostly, linear pattern along the roads would follow avenue plantation with minimum distance of 10-12m between two trees. Also, it should be ensured that at intersections, the trees should be at least 3 m away from closing in towards the intersection for better visibility.

As advised by the horticulture department, the minimum accepted height for the sapling tree should not be less than 1.8 m and preferably above 7 feet and 2.5 cm caliper size and the plant should have been grown in polythene bags having a minimum size of 10 inch.

A minimum area of 1.25m x 1.25m around the trees should be left open and un-cemented widening of roads up to the trunk of the trees should be stopped as roots come under the asphalted roads which may cause impact on tree growth.

Topsoil or good earth shall be a friable loam, typical of cultivated topsoil of the locality containing at least 2% of decayed organic matter (humus). It shall be taken from a well-drained arable site. It shall be free of subsoil, stones, earth skids, sticks, roots or any other objectionable extraneous matter or debris. It shall contain no toxic material. It shall have pH value ranging in between 6 to 8.5.

New trees which may be called second generation of trees must be planted preferably 2-3m behind the existing line of trees in an alternate position or inside the compounded areas, a mix of foliage and fruits trees should be chosen for this purpose. Following are the selection of tree varieties shortlisted:

S. No.	Name of Tree	S. No.	Name of Tree
1	Alostonia	13	Bahera
2	Chukrasia	14	Sukhchain
3	Putranjeeva	15	Meterophragma
4	Neem	16	Milletia
4	Pipal	17	Sterculia
5	Banyan	18	Toona
6	Pilkhan	19	Silver Oak
7	Gulmohar	20	Ficus (golden, black, green)
8	Amaltas	21	Mango
9	Jacaranda	22	Bael
10	Lagarstroemea	23	Jammun
11	Mahagony		
12	Arjun		

e) Procurement of plants by ULBs

In guidelines issued by DoLG vide letter no: CE(IT) -2017/1313-29 dated 25-7-2017, procurement of plants by ULBs has been advised. The ULBs may procure the plants from the government nurseries of forest department/horticulture department at the government approved rates or purchase the plants after adopting due approved process of procurement specified by the Local Government in existence. Each and every such procurement should be entered in stock/property/asset register

f) Protection of existing trees

To ensure the sustenance of the new and existing trees, ULBs must undertake stringent measure to safeguard the growth of trees by

- Removal of hoarding/ banners/ wires/ debris / nails entangled to tree branches
- Removal of tree guards obstructing the fully grown trees
- De-concretization of the roots of the trees at-least 1 m from the trunk for better growth

V. Geo-Tagging and GIS Mapping of the Plantation

Using technology-based solution for accounting green cover area, conducting tree census and monitoring sustenance of the trees over the time is very crucial. Hence, an application has been developed by the PMIDC which will facilitate to conduct geo-enabled Tree census survey and plot the same on city map. This application will be further linked to a dashboard that will provide information on plantation programme progress, Quality checks status, layout of different varieties/specifies, distribution under different wards etc.

- Geo tagging of all the trees in the ULB
- Query Search for trees by species, location, or advanced filters such as diameter, date planted, or tree characteristics, etc.
- Tree photos.
- Monitor the progress on real time basis
- Get optional integrated tree key to assist in identifying tree species

Spatial Inventory

- Through geotagging a spatial inventory will be available for urban trees. This can be used to schedule maintenance, tree care and other regular operations.
- In addition, such inventory will be crucial when applying green or carbon credit calculations in urban regions which would be cross-verified with the plantation records kept during each plantation drive by ULBs and future urban planning actions.

VI. Operation and Management of parks developed under the ULBs

The DoLG issued policy guidelines notification no. 5/65/2017-1LG-II/1021 dt. 11/05/2017 for all ULBs with the objective of having systemic maintenance, management of services and amenities in the parks developed under AMRUT scheme. The items considered for maintenance of park included

- House keeping
- Solid waste management

- Water supply
- Maintenance of street/park lighting
- Children play area maintenance
- Civil structure maintenance
- Onsite composting of horticulture waste in parks/green belts, institutional open lands.

The policy documents also include multiple modes for maintenance including PPP models, community-based participation models which can be explored and adopted by the ULBs while planning for maintenance of parks and plantation areas.

The plantation programs can be leveraged as a crucial tool to engage the local community in deployment of urban services and increase urban residents' interaction with nature and natural spaces. Such engagement fosters a sense of stewardship for implemented plantation drives and existing urban greenery, making citizens active partners in the protection, restoration and creation of urban natural and green spaces.

Encouraging communities' participation and involving NGO's in organizing collective events to celebrate flower blooming seasons – similar to Rose festival organized in Chandigarh, Tulip Garden in Srinagar would ensure sustainability beyond the plantation drive and develop active convening roles which community and NGO volunteers can take up supporting the greening actions objectives for the ULBs.

Additional methods to engage the community in plantation drives is to promote rewilding initiatives around natural spaces (drains and streams) in the pre and early monsoon seasons by providing seed bombs, seedlings to interested parties, engaging them as custodians of planted trees for upkeep and maintenance, creating biodiversity hotspots on private lands (butterfly gardens, bird havens) by creating a citywide vision for plantations and greening as part of the greening action plan outlined by each ULB.

- **Fixing Pricing and Rates for plantation**

While the price for each sampling would be different for each ULB, however, for purpose of estimating budget and for the Calculation of Cost for Plantation Plan, following parameters should be considered:

For Capital Cost	For Recurring Cost:
• **Cost of Sapling (Trees/Shrub/Herbs)** • **Transportation Charges** • **Planting cost (including soil & moisture workings, pits etc.)** • **Fencing Cost/Tree Guard** • **Labour Charges/Gardner/Others**	• Cost of drip irrigation if required • Annual weeding and soil working • Requirement of water for irrigation • Fertilization Cost • Security and Vigilance