

# TERMS OF REFERENCE FOR THE R&D PROJECT

**TITLE: Study of Greenbelt Development and Management for Projects and Activities.**

## 1. BACKGROUND

**2.1** Developmental projects and activities may fulfil the needs of people but can also cause potential environmental impacts. Therefore, many of the projects and activities require environmental clearances from concerned authorities before initiation of the project (EIA Notification, 2006). In order to mitigate the extent of pollution from such projects, one of the pollution mitigation method recommended by concerned authority is the development of greenbelt since trees and plantations are natural filters and barriers against pollution. It is imperative that the term 'Greenbelt' has a proper definition and its development adheres to scientific planning.

**2.2** Considering the importance of greenbelt, Environmental Services Sectional Committee, SSD 07 has decided to formulate an indigenous Indian Standard covering guidelines on 'Greenbelt Development and Management'. A well designed and scientifically developed, managed and maintained greenbelt can be highly effective for curbing pollution emerging from the concerned projects and therefore, the committee decided to conduct study of the requirements of various phases involved in development and management of such greenbelts. This study will also provide opportunity to standardise the definition of terms such as, but not limited to, Greenbelt, Green Space, Green Cover, Green Avenues and Green Corridors to provide clarity and consistency in understanding and using these terms.

## 2. OBJECTIVE

To collect and analyse information and data from primary and secondary sources on the prevalent practices, principles, processes and methodologies associated with development of greenbelts in for projects and activities spread across different Agro-Climatic zones of India.

## 3. SCOPE

**3.1** Undertake study of existing literature which includes published research papers, established documents, guidelines, study conducted by any other organization, Standard Operating Procedures (SoPs), best practices, international standards/standards of NSBs of foreign country, if any.

**3.2** Comparative analysis of data collected on parameters given in para **3.1**.

**3.3** Identification of the greenbelts existing in different agro-climatic zones as per the sampling plan given in para **3.4** to study the following:

- a) Definition of Greenbelt and other related terms.
- b) Applicable Regulatory and Statutory requirements.
- c) Processes and methodology to be adopted for development and management of Greenbelt.
- d) Planning and implementation adopted for Greenbelt development.
- e) Infrastructure required for Greenbelt development.

- f) Criteria to decide on size /area of greenbelt.
- g) Parameters involved in soil quality assessment.
- h) Methodology for site preparation and planning (also include eligibility of experts responsible for the Planning)
- i) Criteria for the selection of the suitable plant species to be taken up in the greenbelt located at different ACZs.
- j) Planting pattern based on the site and pollutant load and emission characteristics (in case of industrial green belt) including
  - i. Criteria for length and width of the greenbelt;
  - ii. Criteria for optimum density of plants;
  - iii. Pit size for plantation of trees and shrubs;
  - iv. Criteria for length, width, age, and size of plants;
  - v. Different planting pattern designs considering site-specific, micro-climate and dispersion of the pollutants;
- k) General Greenbelt Development Plan
  - i. activity timeline;
  - ii. resource requirements;
  - iii. roles and responsibilities of the service provider and other stakeholders;
- l) Nursery management
  - i. criteria of plant selection and procurement;
  - ii. nutrient requirements;
  - iii. pest and weed control requirements;
  - iv. rearing of plant sapling/ seedlings;
  - v. water resources;
- m) Operation & Maintenance (O&M) plan
  - i) fencing and staking practices for plant protection;
  - ii) water management at the site;
  - iii) criteria of frequency of watering and quality of water to be used for plantation;
  - iv) survival rate and replacement of saplings on non-survival;
- n) Procedures for waste management during development of Greenbelt (waste management plan to be studied).
- o) Social, economic and environmental benefits.
- p) Workplace safety and training.
- q) Emergency response preparedness.
- r) Performance/review of greenbelt service provider.
- s) Criteria for the evaluation of greenbelt (covering assessment of plant survival rate, Survival percentage, UAV ariel photography of Plants, Density of trees, Leaf area index)

**3.4** Identify the greenbelts (10 in number) in different agro-climatic zone and relevant stakeholders to visit and conduct a study in context of para **3.3**, as per the sampling plan given below:

<b>Agro-Climatic Zone</b>	<b>Number of Greenbelts to be studied</b>
Zone 3- Lower Gangetic Plains	2
Zone 7- Eastern Plateau and Hills region	2
Zone 8 - Central Plateau and Hills region	2
Zone 12 - West Coast Plain and ghat region	1
Zone 10 - Southern Plateau and Hills	2
Zone 14 - Western Dry region	1

*Note: In case of any modification in Agro-climatic zone in sampling plan is needed , the same may be communicated to BIS with justification before proceeding further for visits.*

**3.5** Prepare an analytical report covering the details mentioned in para from **3.1** to **3.4**.

#### **4. RESEARCH METHODOLOGY**

The development of the report should follow a structured methodology that includes, but not limited to the following:

- a. A thorough literature reviews as per para **3.1**.
- b. Identification of greenbelt complying to condition as given in para **3.4**. Before conducting on-site visits for the study of Greenbelt, the consent of BIS shall be taken. No sample collection and laboratory analysis shall be undertaken under this R&D project.
- c. Witness and observe the requirements given in para **3.3** during the visits.
- d. Focused group discussions after the visits to analyze and comparative analysis of the collected data.
- e. Prepare a report based on the findings and data collected as per para **3**.

#### **5. DELIVERABLES**

An analytical report containing information/data as mentioned in Clause **3** along with the evidence containing statements, questionnaire, details of interviews, outcome of consultation with experts and data collected during literature review and visits. Hard as well as soft copy of the report shall be submitted within the timeframe.

#### **6. TIMELINE AND METHOD OF PROGRESS REVIEW**

The time frame of completing the study and submitting the Final Report is **6 months** from the date of the award of the project.

### **Stagewise timelines:**

- a) Interim Report covering the review of the literatures, existing stipulations and visits plan for approval of BIS – **within 1 month** from the date of award of project from BIS.
- b) Report of site visits by **end of 4 months** from the date of award of project from BIS.
- c) Draft project report covering all the aspects of the ToR – By end of **5 months** from the date of assignment received from BIS.
- d) The researcher taking up the project shall clear all doubts on provisions of research including ToR and BIS guidelines before acceptance.

### **7 BIS SUPPORT**

BIS will provide access to latest available editions of Indian standards and/or international standards relevant to the project, on request.

### **8. SECTIONAL COMMITTEE AND NODAL PERSON**

#### **Sectional Committee:**

Environmental Services Sectional Committee, SSD 07

#### **Nodal Person:**

Member Secretary, SSD 07  
Services Sector Department  
Bureau of Indian Standards  
Mail: [ssd@bis.gov.in](mailto:ssd@bis.gov.in)