



Forest Afforestation Mapping and Plantation Management System

User Manual

Developed by



Forestry, Wildlife and Fisheries Department

Government of the Punjab, Lahore Pakistan



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Forest Afforestation Mapping and Plantation Management System

A web-based platform for Forest Afforestation Mapping along with Plantation Schemes Statistics and detailed view of plantation sites on map. It also provides an overview of Forest Cover classes and their covered area stats for the years 2024 and 2025.

Second module consists of insertion of new plantation inventories and updation of existing plantation points along with view stats and details on scan of barcode.

Key Modules:

Forest Afforestation Management System – Data Entry Module

1. Plantation Overview
2. Insertion of New Plantation Points.
3. Updation of existing Plantation Points
4. Plantation Details Table

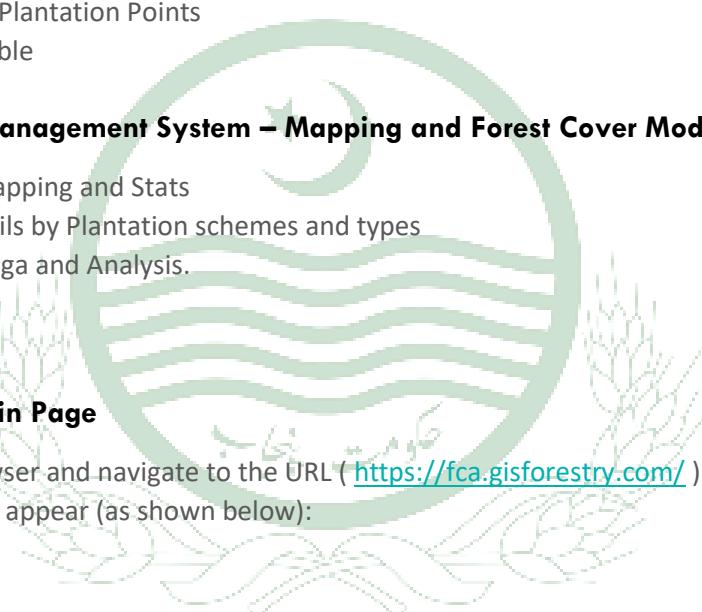
Forest Afforestation Management System – Mapping and Forest Cover Module

5. Afforestation Site Mapping and Stats
6. Summaries and Details by Plantation schemes and types
7. Forest Cover Mapping and Analysis.

Sign In / Login

Step 1: Access the Login Page

8. Open your web browser and navigate to the URL (<https://fca.gisforestry.com/>).
9. The Login screen will appear (as shown below):



Step 2: Enter Credentials

10. Username: Enter your assigned email / username (e.g., dfo_gujrat).
11. Password: Type your password (case-sensitive).

Step 3: Sign In

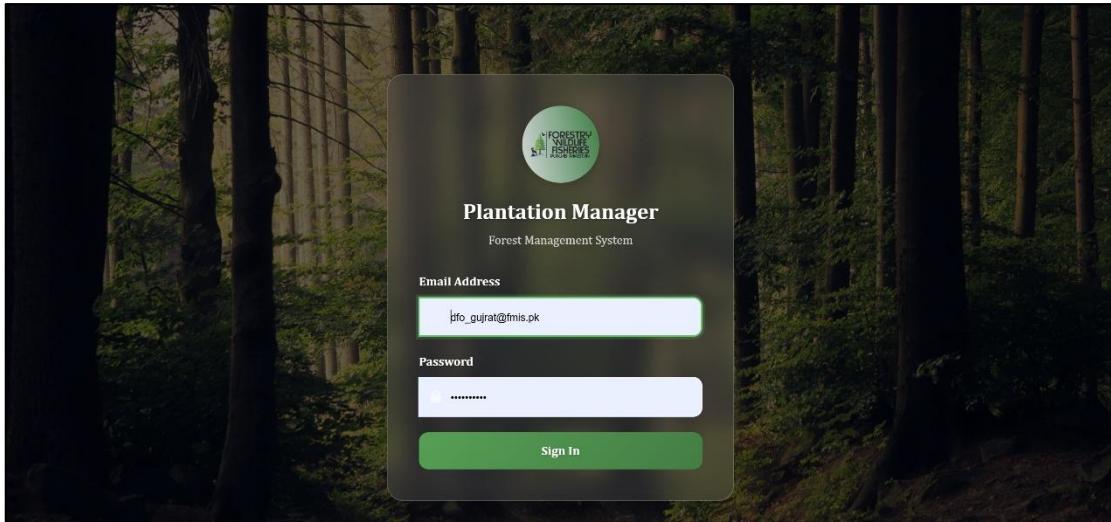
12. Click the "LOGIN" button.

If credentials are correct, you will be redirected to your role-specific welcome page.

Troubleshooting:

✖ Invalid Credentials: Ensure caps lock is off and retry. Contact admin if issues persist.

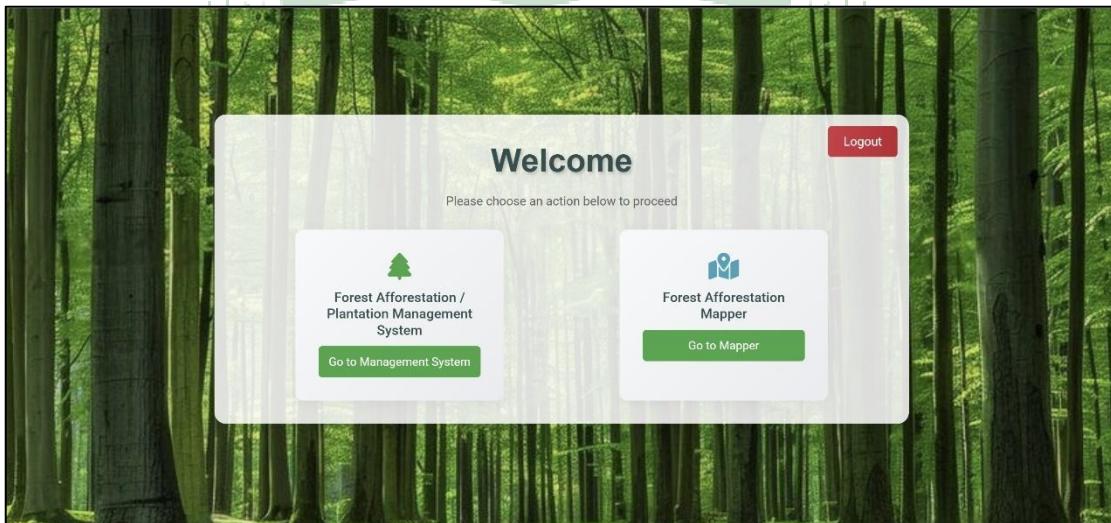
Login Screen Overview



Welcome Screen Overview

Two main modules:

1. Forest Afforestation/Plantation Management System
2. Forest Afforestation Mapper



Key Actions

1. Forest Afforestation/Plantation Management System

13. Click "Go to Management System".
14. A screen will appear with Cards, Map and Table View.

System Overview

This page allows users to monitor, add, update, and manage afforestation (tree-planting) sites in regions like Punjab, Pakistan (based on login from respective DFOs). It includes a dashboard with statistics, filters, an interactive map, and a data table.

FORESTRY
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Forest Afforestation Management System

dfo_gujrat |
Gujrat,
Gujranwala

Logout

Plantation Overview

Compact **35** 912,340 plants

Linear **2** 100,000 plants

Nursery **2** 1,00,000 plants

Total **39** 2,012,340 plants

Filters & Selection

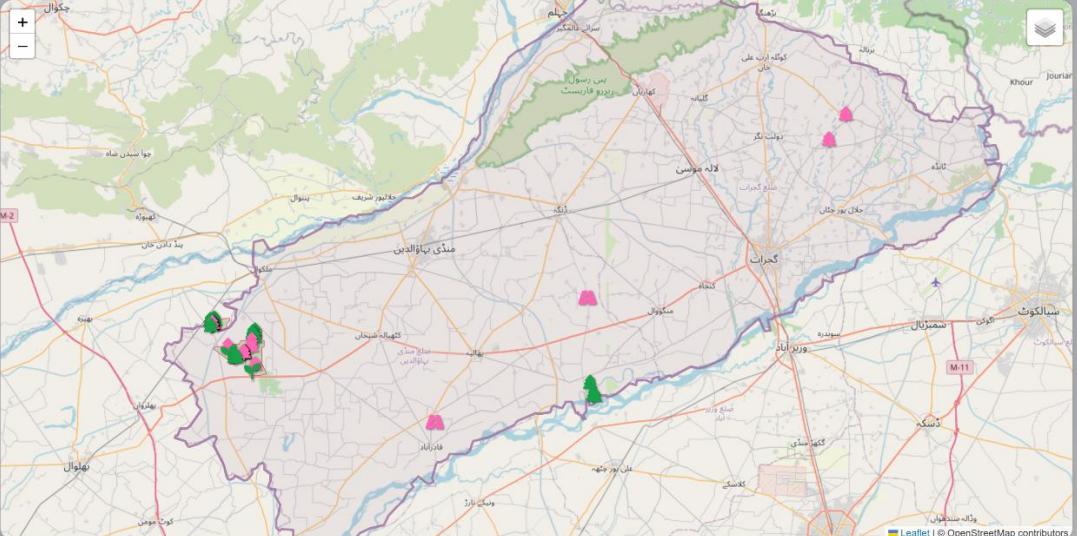
Zone: Central Zone

Circle: Gujranwala

Division: Gujrat

Plantation Type: All Types

Refresh Data



Plantation Details Table

| QR CODE | SITE | TYPE | YEAR | SCHEME NAME | CULTIVATION STATUS | Zone | Circle | Division | Forest Name | DISTRICT | TEHSIL | AVENUE KM | RD KM NO | TOTAL PLANTS |
|------------------------------|-------------|----------------------|------|-------------|--------------------|--------------|------------|----------|-------------|-----------------|--------|-----------|----------|--------------|
| View QR Code | Phalia | CANALSIDE PLANTATION | 2025 | CMPP | Proposed | Central Zone | Gujranwala | Gujrat | N/A | Mandi Bahauddin | Phalia | 120 | 0-90/L&R | 60000 |
| View QR Code | Pahrianwali | CANALSIDE PLANTATION | 2025 | CMPP | Proposed | Central Zone | Gujranwala | Gujrat | N/A | Mandi Bahauddin | Phalia | 80 | 0-32/L&R | 40000 |

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Statistics Cards (Plantation Overview):

- **Compact:** Tree icon, shows sites and plants (e.g., 35 sites, 912,340 plants).
- **Linear:** Road icon, for roadside plantations.
- **Nursery:** Seedling icon for Raising of Bed Nursery Plantations.

- **Total:** Pie chart icon, aggregates all.

Note: These update when filters are applied or data is refreshed.

Filters & Selection:

- **Zone:** Dropdown – will be already populated from login (e.g., "Central Zone").
- **Circle:** Dropdown – will be already populated from login (e.g., "Gujranwala").
- **Division:** Dropdown – will be already populated from login (e.g., "Gujrat").
- **Plantation Type:** Dropdown (options: All Types, Compact, Linear, Bed Nursery).
- **Forest (hidden by default):** Appears for **Compact** and **Bed Nursery** types.
- **Refresh Data:** Green button to reload data based on filters.

1. Map:

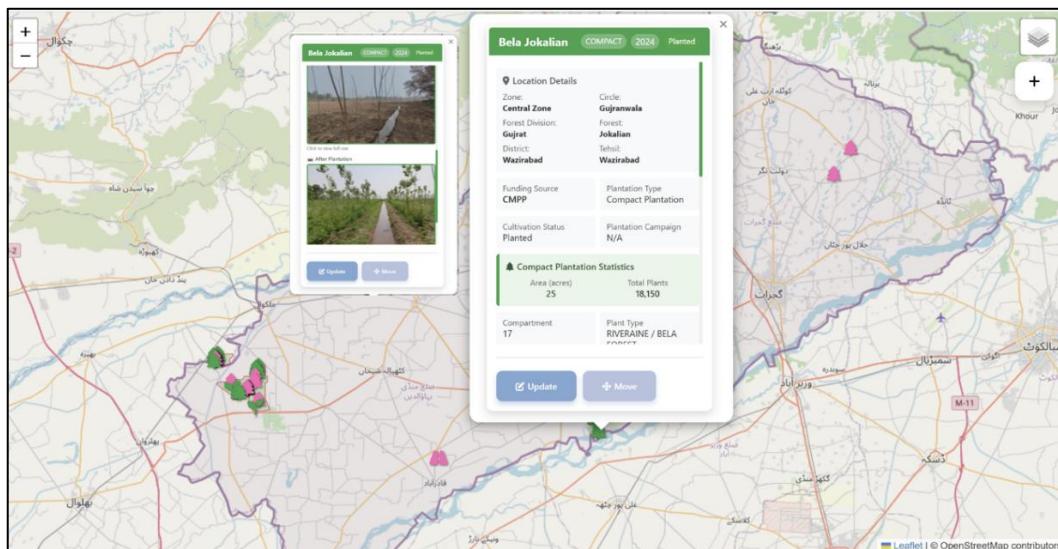
- Shows markers for plantations (e.g., green for compact, pink for others).
- **Controls:** "+" button to add new points (bottom-right).
- **Loading Overlay:** Spinner appears during data loads.

2. Table (Plantation Details):

- Scrollable table with sticky headers.
- **Columns:** Code, Site, Type, Year, Scheme, Cultivation Status, Zone, Circle, Division, Forest Name, District, Tehsil, Avenue KM, RD KM No, Total Plants.
- **QR Code:** Clickable for details (e.g., "View QR Code" buttons).

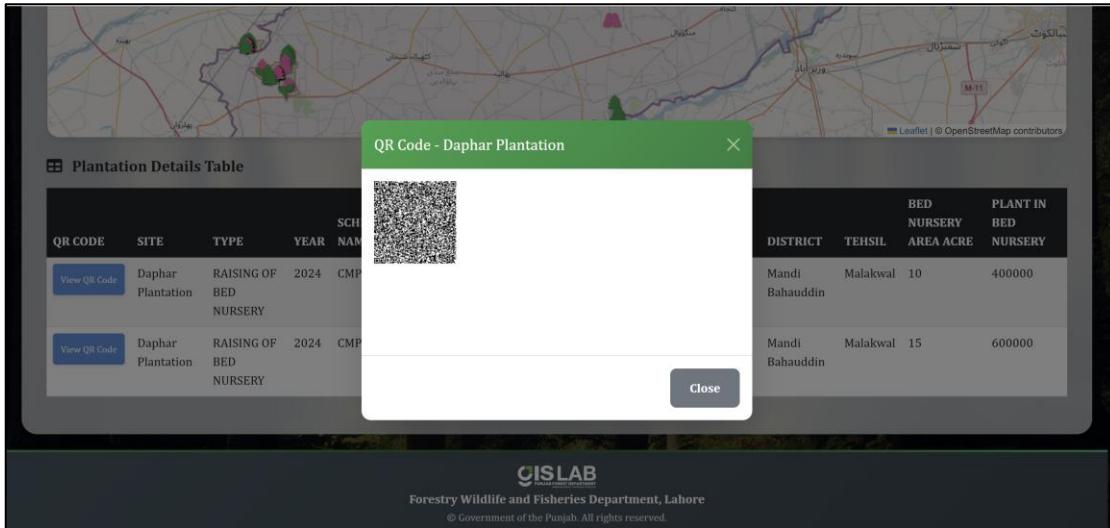
Viewing and Filtering Data

- **Apply Filters:**
 - Automatically Selected values from dropdowns on login, Select Plantation Type (e.g., "Compact").
 - Click "**Refresh Data**" to update the map, statistics, and table.
 - The map zooms to filtered areas; markers update.
- **Interact with the Map:**
 - **Zoom/Pan:** Use mouse wheel or controls.
 - **Click Markers:** Opens details (e.g., pop-up with site info).



- **View Table Data:**

- Scroll vertically for more rows.
- Can be updated type wise when clicked on cards above as well.
- Click "View QR Code" in a row to open the QR modal.



The screenshot shows a map of a forest area with several green plantations marked. A modal window titled "QR Code - Daphar Plantation" is open, displaying a QR code and the following table:

| QR CODE | SITE | TYPE | YEAR | SCH |
|------------------------------|-------------------|------------------------|------|-----|
| View QR Code | Daphar Plantation | RAISING OF BED NURSERY | 2024 | CMP |
| View QR Code | Daphar Plantation | RAISING OF BED NURSERY | 2024 | CMP |

Below the table is a summary table:

| DISTRICT | TEHSIL | BED NURSERY AREA ACRE | PLANT IN BED NURSERY |
|-----------------|----------|-----------------------|----------------------|
| Mandi Bahauddin | Malakwal | 10 | 400000 |
| Mandi Bahauddin | Malakwal | 15 | 600000 |

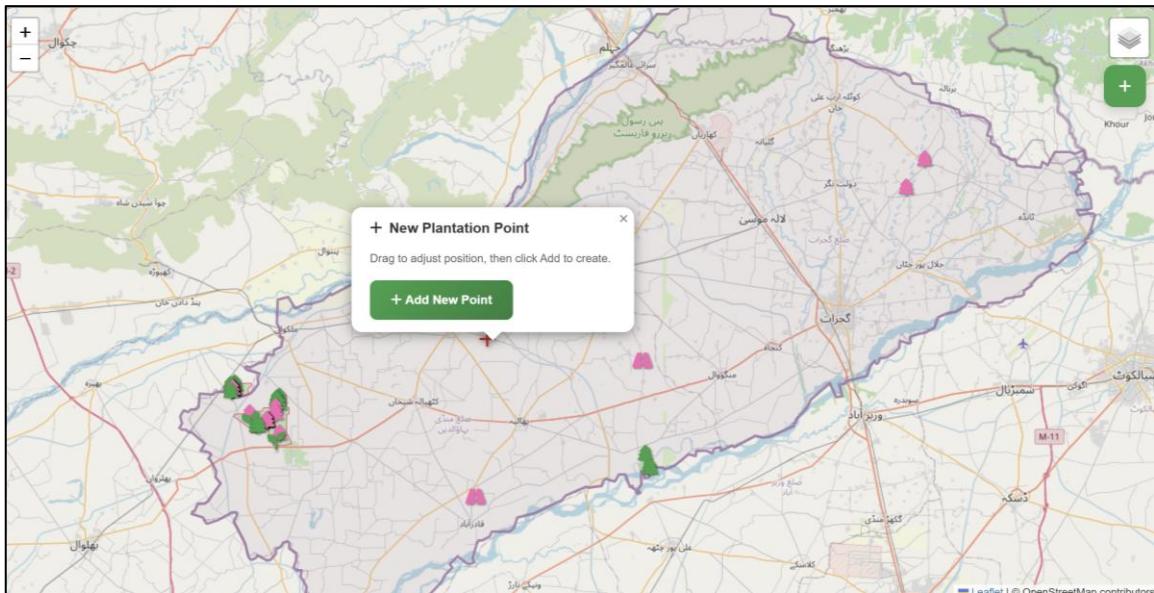
At the bottom of the modal is a "Close" button.

The footer of the page includes the "GISLAB" logo and the text "Forestry Wildlife and Fisheries Department, Lahore" and "© Government of the Punjab. All rights reserved."

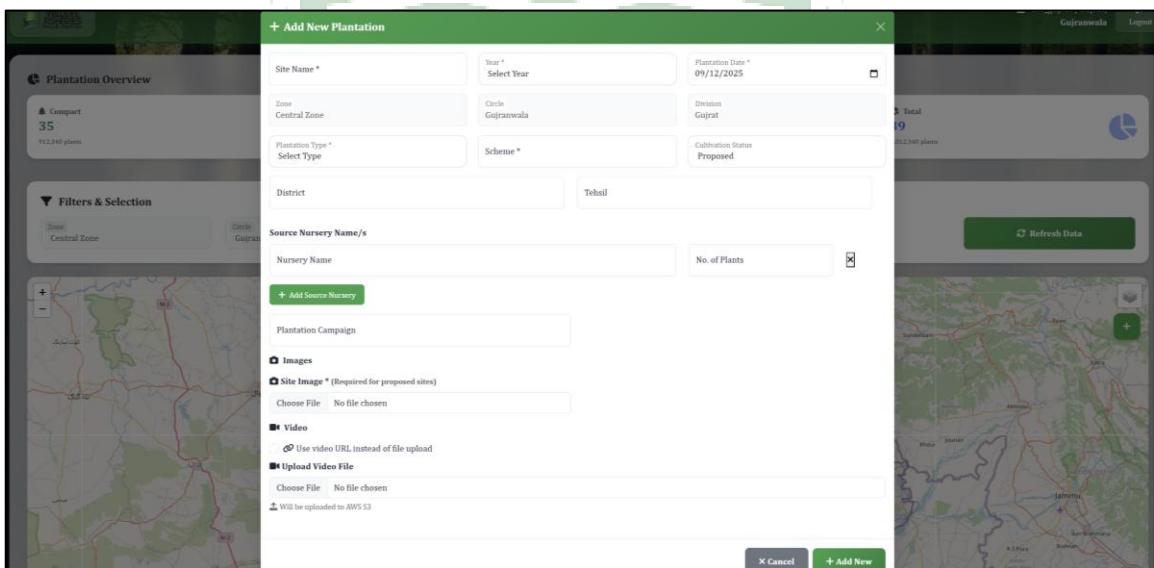
- **Adding a New Plantation**

- Click the "+" button on the map (bottom-right; title: "Add New Plantation Point").
- Click on the map to place a draggable marker (sets latitude/longitude).
- The Plantation Modal opens automatically:
 - **Title:** "Add Plantation" (or "Update" for edits).
 - **Fields (required marked with *):**
 - i. **Basic:** Site Name*, Year*, Plantation Date*.
 - ii. **Location:** Zone, Circle, Division (read-only, auto-filled).
 - iii. **Type*:** Compact, Linear, Bed Nursery, Others.
 - a. **Compact:** Shows Forest Name, Compartment No, Planted Area, Total Plants.
 - b. **Linear:** Shows Avenue KM, RD KM No, Total Plants.
 - c. **Nursery:** Shows Nursery Area, Plants in Nursery.
 - d. **Others:** Custom Type*, Area, Total Plants.
 - iv. Scheme*, Cultivation Status (Proposed, In Progress, Active).
 - v. District, Tehsil.
 - vi. Source Nursery Names: Add multiple (name and plant count) via "+ Add Source Nursery" (required for 2025+ years).
 - vii. Plantation Campaign.
 - viii. Images:
 - a. For Proposed: Site Image* (max 1MB; JPEG/PNG/GIF/WebP).
 - b. For Active/In Progress: Before/After Images (optional).
 - ix. Video: Upload file (max 5MB; MP4/AVI/etc.) or link (toggle checkbox).

Previews: Images show thumbnails after upload.

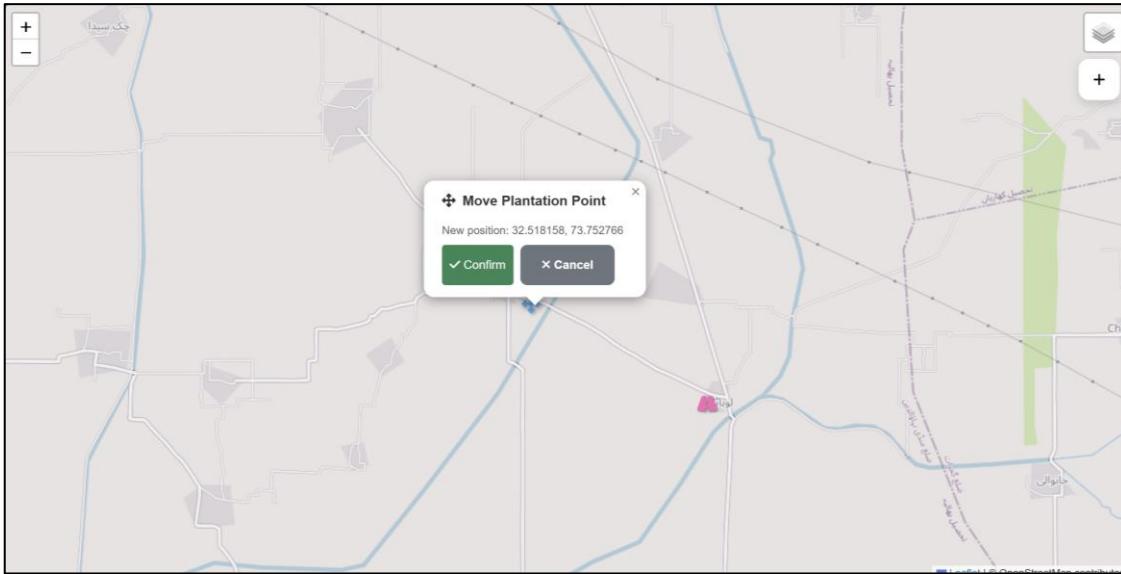


- **Click "Add New" (or "Update").**
 - Validates fields (e.g., required ones, file sizes).
 - Uploads Images.
 - Shows success alert; refreshes data.
- **Cancel: Close modal; removes temporary marker.**



Editing an Existing Plantation

1. Click a marker on the map or a table row and click on update button.
2. Plantation Modal opens with pre-filled data.
3. Same validation and upload process as adding.
4. For years <2025, source nurseries are hidden.



Pro Tip: Carefully see:

- Refresh only when needed; large datasets may slow loading
- Keep images <1MB, videos <5MB. Previews help verify
- Required fields turn red if invalid. Alerts show errors (e.g., "Please fill all required fields")
- Responsive, but map interaction is better on desktop

Troubleshooting

✗ Loader stuck?

- Refresh page (F5)

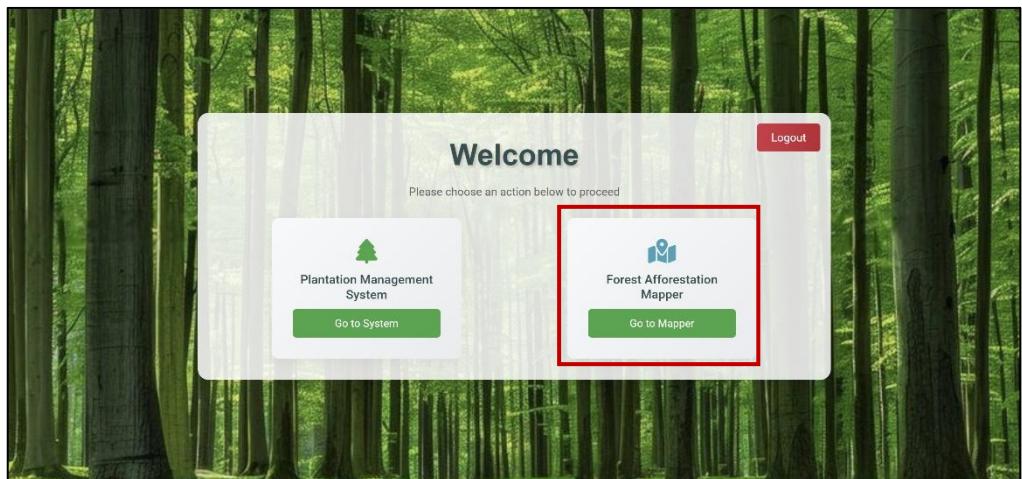
Forest Afforestation Management System (Dashboard Page)

This page serves as the main overview dashboard, providing visualizations, summaries, and maps for afforestation (tree-planting) activities and forest cover changes across regions (e.g., zones such as Central, Northern, Southern).

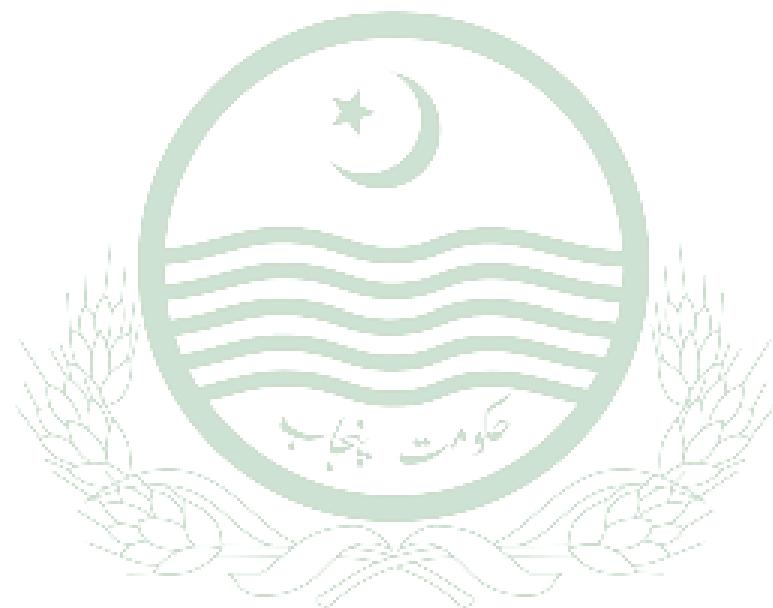
Key Actions

2. Forest Afforestation Mapper

1. Click "Go to Management System".
2. A screen will appear with Cards, Map and Table View.



Screen Overview




Forest Afforestation Management System

Afforestation / Plantation Mapping

Plantation Overview

Data for 2025

| | | | |
|---|--|--|--|
|  Compact Plantation |  Linear Plantation |  Bed Nursery |  Grand Total |
| 18,810,327 TOTAL PLANTS | 1,604,561 TOTAL PLANTS | 0 TOTAL PLANTS | 20,494,888 TOTAL PLANTS |
| Area: 21,971.5 acres | Length: 2,304 km | Area: 0 acres | Compact: 91.8% Linear: 8.2% Nursery: 0.0% |

Forest Cover Change Analysis

Afforestation Site Mapping Filters

| | | | | |
|--------------------|--------------------|-------------------|-----------------------|------------|
| Zone: Central Zone | Circle: Gujranwala | Division: Gujarat | Forest: Select Forest | Year: 2025 |
|--------------------|--------------------|-------------------|-----------------------|------------|

Geographic Overview of Plantation Sites

Summary by Type

| | | | |
|--|---|--|---|
| Central Zone Total Plants: 2,820,962 all types | Northern Zone Total Plants: 6,135,926 all types | Range Management Total Plants: 1,622,500 all types | Southern Zone Total Plants: 9,915,500 all types |
| Breakdown by Type: 3,839 acres, 400 ave. km, 0 acres | Breakdown by Type: 7,808 acres, 6.36 ave. km, 0 acres | Breakdown by Type: 1,642.5 acres, 0 ave. km, 0 acres | Breakdown by Type: 9,402 acres, 1,348 ave. km, 0 acres |

Detailed Statistics

Plantation Trends Analysis
Smooth curves showing individual plantation type growth

Plants Distribution by Funding Source
Interactive breakdown by plantation types

| Year | Scheme | Plantation Type | Plantation Sites | Plants | Area/Length | Unit |
|------|--------|-----------------|------------------|-----------|-------------|---------|
| 2025 | CMPP | Compact | 19 | 506,990 | 565 | acres |
| 2025 | CMPP | Linear | 2 | 100,000 | 200 | ave. km |
| 2024 | CMPP | Compact | 5 | 90,750 | 125 | acres |
| 2024 | CMPP | Nursery | 2 | 1,000,000 | 25 | acres |
| 2024 | UGPP | Compact | 11 | 314,600 | 300 | acres |

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Key Components

Plantation Mapping Tab:

- Overview cards (e.g., Compact: 18,810,327 plants, 21,071 acres).
- Filters (Zone, Circle, Division, Forest, Year).
- Interactive map with scheme legend (e.g., CMPP in green, UGFP in blue).
- Zone summary cards (e.g., Central Zone: 7,820,962 plants).
- Division table (e.g., Gujranwala Circle, Gujarat Division: 1,040,790 plants).
- Charts: Line for trends (2023-2025), Pie for funding sources.
- Statistics table (e.g., 2025 CMPP Compact: 19 sites, 506,590 plants).

1. **Change Analysis Tab:** Filters and map for satellite-based forest cover changes.

2. **Tabs:**

- **Afforestation / Plantation Mapping:** Active by default (seedling icon).
- **Forest Cover Change Analysis:** Line chart icon; switches content when clicked.

Plantation Mapping Tab:

- **Plantation Overview**
 - Compact (green): Plants and acres.
 - Linear (orange): Plants and km.
 - Bed Nursery (purple): Plants and acres.
 - Grand Total (red): Aggregated plants with percentages.
- **Filters:** Dropdowns for Zone (e.g., Central Zone), Circle (e.g., Gujranwala), Division (e.g., Gujarat), Forest (select after division), Year (e.g., 2025). Selections cascade (e.g., select zone to enable circle).
- **Map:** Leaflet-based with markers (e.g., yellow/orange icons), scheme control panel (checkboxes for schemes like CMPP, UGFP; toggle visibility).
- **Summary by Type:** Colored cards for zones (e.g., Central: Blue, Northern: Purple) with plant totals and type breakdowns (icons for compact, linear, nursery).
- **Division Table:** Scrollable table with sticky headers; columns: Zone, Circle, Division, Total Plants, Compact (acres), Linear (avenue km), Bed Nursery (acres). Example rows: Central Zone, Gujranwala, Gujarat: 1,040,790 plants.
- **Detailed Statistics:**
 - **Plantation Trends Analysis:** Line chart showing plants over years (2023-2025) by type (compact blue, linear orange, nursery green).
 - **Plants Distribution by Funding Source:** Pie chart (e.g., UGFP blue, CMPP green).
 - **Statistics Table:** Columns: Year, Scheme, Plantation Type, Sites, Plants, Area/Length, Unit. Example: 2025 CMPP Compact: 19 sites, 506,590 plants, 545 acres.

Viewing and Filtering Data

1. **Select Tab:**

- Click tabs to switch between Plantation Mapping and Change Analysis.

2. **Apply Filters (Plantation Tab):**

- Choose Zone (e.g., Central Zone) → Enables Circle (e.g., Gujranwala) → Enables Division (e.g., Gujarat) → Enables Forest.

- Select Year (e.g., 2025) to filter data.
- Changes auto-update: Overview cards, map markers, zone cards, division table, charts, and stats table refresh.
- If "ALL_ZONES" or no selection, shows province-wide data (e.g., Punjab boundary on map).

3. **Interact with the Map** (Plantation Tab):

- **Zoom/Pan:** Use mouse or controls.
- **Markers:** Represent sites; colors/icons by scheme/type (e.g., green for CMPP).
- Scheme Control: Top-right panel (layer icon); expand to check/uncheck schemes (e.g., CMPP, UGFP). "Select All" toggles all.
- **Boundaries:** Punjab province outline (red dashed); zooms to fit selected area.
- **Pop-ups:** Click markers for details (e.g., site info, not fully detailed in code).

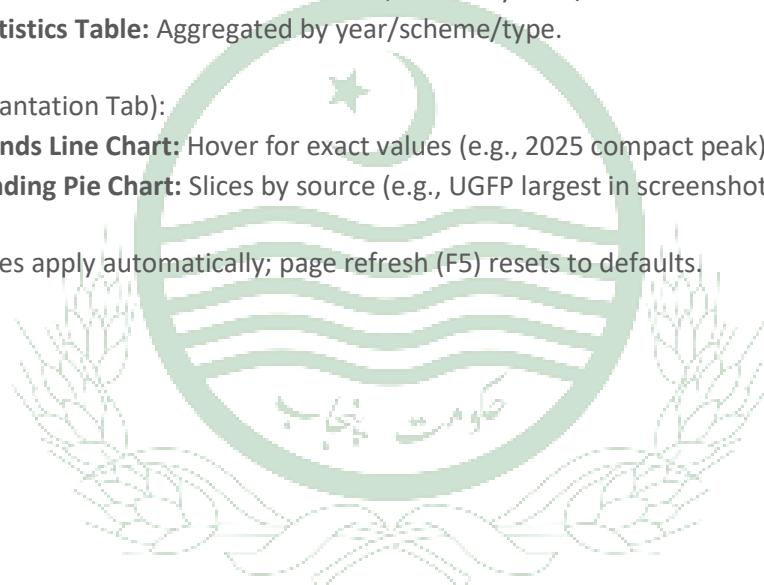
4. **View Summaries and Tables** (Plantation Tab):

- **Zone Cards:** Visual breakdowns by type (e.g., compact plants with tree icon).
- **Division Table:** Scroll for more rows; sorted by zone/circle.
- **Statistics Table:** Aggregated by year/scheme/type.

5. **View Charts** (Plantation Tab):

- **Trends Line Chart:** Hover for exact values (e.g., 2025 compact peak).
- **Funding Pie Chart:** Slices by source (e.g., UGFP largest in screenshot).

Refresh/Reload: Changes apply automatically; page refresh (F5) resets to defaults.



Change Analysis Tab:

It guides users through the features, navigation, and operations of the satellite-based forest cover change analysis section in the Forest Afforestation Management System. This tab focuses on visualizing and analyzing land use/land cover (LULC) changes over time using satellite data, helping forestry officials monitor environmental shifts (e.g., deforestation, tree cover expansion) in Punjab, Pakistan. Unlike the Plantation Mapping tab, this is view-only for insights into broader ecological trends.

System Overview

The screenshot displays the 'Forest Cover Change Analysis' tab of the system. The top navigation bar shows the 'Afforestation / Plantation Mapping' and 'Forest Cover Change Analysis' tabs, with the latter being the active one. Below the navigation is a 'Change Analysis Filters' section with three dropdowns: 'Zone' (set to 'Northern Zone'), 'Circle' (set to 'Select Circle'), and 'Division' (set to 'Select Division').

The main content area is divided into three sections:

- Geographic Overview of Satellite Based Change Analysis:** A map of the Northern Zone of Punjab, Pakistan, showing land cover changes between 2023-24 and 2024-25. The map highlights areas of tree cover expansion (green) and contraction (red). A legend on the right identifies the land cover types: Tree, Grass/Shrubs, Water, Barren Land, and Builtup. A sidebar on the left shows a dropdown menu for 'Change Analysis' with '2023-24' and '2024-25' selected.
- Forest Cover Change:** A bar chart titled 'Satellite based Forest Cover Change Analysis' comparing land area in acres for the two periods. The chart shows a slight decrease in total forest cover from 704.8K in 2023-24 to 715.3K in 2024-25. The chart includes a legend for '2023-24' (green) and '2024-25' (dark green).
- Land Use Land Cover Statistics:** A table showing the area in acres for each land cover type in both 2023-24 and 2024-25, along with the percentage change. The table includes a 'Total' row and a 'Change (%)' column indicating the percentage difference between the two years.

| Land Cover Type | 2023-24 (acres) | 2024-25 (acres) | Change (%) |
|-----------------|-----------------|-----------------|------------|
| Tree Cover | 704783.25 | 715273.47 | +1.5% |
| Grass/Shrubs | 78971.55 | 71546.05 | -9.4% |
| Water | 1887.19 | 1781.16 | -5.6% |
| Barren Land | 30744.29 | 27718.29 | -9.8% |
| Builtup | 7169.76 | 7237.06 | +0.9% |
| Total | 823556.04 | 823556.03 | - |

Page Footer: The footer contains the 'GISLAB' logo, the text 'Forestry Wildlife and Fisheries Department, Lahore', and a copyright notice: '© Government of the Punjab. All rights reserved.'

Key Components

1. Change Analysis Filters:

- **Zone:** Dropdown (e.g., "Northern Zone" selected).
- **Circle:** Dropdown (e.g., "Select Circle"; enabled after zone).
- **Division:** Dropdown (e.g., "Select Division"; cascades from circle).
- Selections filter the map and stats in real-time.

2. Geographic Overview of Satellite Based Change Analysis:

• Map with:

- **Layers:** Toggle for periods (e.g., "2023-24" in green, "2024-25" in blue polygons showing changes).
- **Legend:** Colors for land cover (green: Tree/Shrubs, brown: Barren Land, blue: Water, orange: Builtup).
- **Controls:** Zoom (+/-), layer switcher (e.g., checkboxes for change periods).
- **Base:** OpenStreetMap tiles with Urdu/English labels.

Example: Green polygons highlight tree cover expansions in northern areas.

3. Satellite Based Forest Cover Change Analysis:

- **Bar chart:** Vertical bars for area (sq km?) by type (e.g., 80k for Tree Cover in 2023-24).
- **X-axis:** Land Cover Types (Tree, Grass/Shrubs, Water, Barren, Builtup).
- **Y-axis:** Area scale (0-80k units).
- **Title:** "2023-24 vs 2024-25" with green bars for comparison.

4. Land Use/Land Cover Statistics:

- Table with columns: Land Cover Type, 2023-24 (acres), 2024-25 (acres), Change (%).

Green highlights for increases (e.g., Tree Cover); red for decreases.

Viewing and Filtering Data

1. Apply Filters:

- **Select Zone** (e.g., Northern Zone) → Enables Circle → Enables Division.
- Map updates to show filtered changes (e.g., zoom to northern Punjab); chart and table recalculate (e.g., tree cover gains in selected area).
- No year filter here (fixed to 2023-24 vs. 2024-25), but aligns with biennial surveys like India's Forest Survey (bi-annual since 1987).

2. Interact with the Map:

- **Zoom/Pan:** Mouse wheel or controls; auto-fits to Punjab boundaries.
- **Toggle Layers:** Check "2023-24" or "2024-25" for change polygons (e.g., green for gains, red for losses).
- **Legend:** Hover for details (e.g., "Tree/Shrubs" in green).
- **Click Polygons:** Potential pop-ups with stats (e.g., area changed; code supports via `onEachFeature`).

3. View Chart and Table:

- **Bar Chart:** Hover bars for exact values (e.g., Tree Cover: 707k acres in 2023-24). Shows trends like tree cover growth (+1.5%), consistent with Punjab's reported 177.22 sq km tree cover increase from 2021-2023.
- **Table:** Scroll if needed; percentages auto-calculate (e.g., +1.5% for trees indicates afforestation success amid barren land loss (-9.6%), possibly from urbanization).

4. Interpret Changes:

- **Positive %:** Gains (e.g., trees from plantations).
- **Negative %:** Losses (e.g., water/barren from development).
- Total near-zero change reflects stable land area, but shifts highlight priorities (e.g., protect water bodies).

Refresh: Filters update automatically; page reload (F5) resets to defaults.

