GREENING CHANDIGARH ACTION PLAN

2021-2022


Look deep into the nature
to understand everything better

Message

Tress give us food and oxygen; two elements required to support life. As we evolved, they provided additional necessities such as shelter, medicine and tools. Trees contribute to our environment by conserving water, preserving soil and supporting wildlife. One acre of forest absorbs six tons of carbon dioxide and puts out four tons of oxygen. Trees, shrubs and turves also filter air by removing dust and absorbing other pollutants like carbon monoxide, sulfer dioxide and nitrogen dioxide.

I am happy that like in previous years, Forest Department, Chandigarh Administration has prepared the Greening Chandigarh Action Plan 2021-22 that includes specific targets and way forward to implement the Green Plan. I appreciate the persistent endeavour of the residents of Chandigarh, NGOs, Government and Private Schools and Chandigarh Green Action Task Group for contributing towards greening of the City Beautiful.

My heartiest congratulations to all the participants of the Greening Chandigarh Campaign and wishes for the success in their endeavours.

V.P. Singh Badnore
Governor of Punjab and Administrator
Union Territory, Chandigarh

सत्यमेव जयते

सत्यमेव जयते

Message

Chandigarh is a dream city that attracts many. It is a city of peace and tranquility so much so that people aspire to spend their best years by living a peaceful life here. With an appreciable combination of superior infrastructure, planned roads and cleanliness, the city of Chandigarh is designated as the City Beautiful. However, there is another factor that adds sparkle to the Chandigarh dream and that is the greenery and natural beauty around. Decked up with plants of all sizes, this place is a sight to behold.

Plants are a boon not only to the mankind but to every living being on the planet. In recent years, with Global Warming showing its adverse effects on us, the importance of trees has been understood and acknowledged manifold.

With the invaluable contribution of residents of Chandigarh and NGOS, Forest Department of Chandigarh has been able to maintain the balance between the nature and the technological advancements.

I congratulate Forest Department of Chandigarh for its continuous efforts in making this city one of the best places and most sought after. I also wish everyone luck for commendable role in achieving the green goals.

Manoj Parida, IAS
Advisor to the Administrator
Union Territory, Chandigarh

सत्यमेव जयते

Message

Forests are a home to wildlife as they protect water systems. They are a source of wellbeing and recreation. Forests also provide renewable material for various products, from everyday necessities to ground-breaking innovations. And that's why they are always more important than ever.

Forests are renewable natural resource providing several forest products. In Chandigarh, forests consist of and conserve a variety of flora and fauna, which forms a rich bio-diversity and plays a vital role in the environmental stability.

Indian State of Forest Report indicated a substantial increase of 15 km^2 in the green cover of Chandigarh. This increase in forest and tree covers is the result of sustained conservation, protection and afforestation efforts and focused implementation of 'Greening Chandigarh Action Plan' by all the greening agencies, community groups and residents of Chandigarh.

My hearty congratulations to the Greening Chandigarh Task Group led by Forest Department, Chandigarh for bringing out a comprehensive Greening Action Plan for 2021-22.

Arun Kumar Gupta, IAS
Home Secretary-cum-Principal Secretary
(Forests & Wildlife)
Union Territory, Chandigarh

सत्यमेव जयते

Message

Scientists have made many predictions. We've all heard the warnings and seen the evidence in the form of COVID-19. In spite of all this, we are using our resources unsustainably, polluting our atmosphere, contaminating our water, and cutting down our trees thereby causing irreversible damage to the only planet we live in.

The polar ice caps are melting at a frightening rate because of global warming. Diseases are emerging like crazy. Chemical pollutants have been responsible for affecting the water bodies more particularly to various river stretches. Chemical pollution in the environment also affects humans. Despite this, the amount of pesticides sprayed on our crops has increased 26 times in the last 50 years. These problems with our earth are very real; and these problems are growing each year due to various anthropogenic activities. Realizing this, greening has been made the integral part of the development in Chandigarh.

It is a matter of pleasure that like every year 'Greening Chandigarh Task Group' has chalked out a detailed Greening Chandigarh Action Plan, 2021-22. I am confident that its implementation will significantly contribute to the greenery of the city beautiful.

I extend my good wishes to all the participants for successful implementation of Greening Chandigarh Action Plan 2021-22 to achieve the greener output.

Debendra Dalai, IFS
Chief Conservator of Forests & Chief Wildlife Warden
Union Territory, Chandigarh

सत्यमेव जयते

Acknowledgement

The 'Greening Chandigarh Task Group' constituted by the Administration formulates Greening Chandigarh Action Plan (GCAP) to chalk out planning of extensive plantation works comprehensively, its implementation, monitoring and to look into all aspects of Silvicultural & Horticultural operations. Due to sustained and sincere efforts of all the greening agencies and other stakeholders, the greenery of City Beautiful has shown a very promising and sustained increase and it is persistently increasing. Encouraged by the positive results, the Task Group has prepared "GCAP 2021-22". The plan comprises of plantation targets of greening agencies and the strategies to achieve the desired results. During the year 2021-22, total 2,55,000 number of saplings will be planted in a phase wise manner on the Government & Private Land. Apart from other valuable information which Action Plan summarizes, a list of trees/shrubs has been recommended that are suitable for plantation under various conditions. Information related to protection and conservation of environment and forests has been also appended, which will be useful in sensitizing the masses and in raising awareness for the protection & conservation of nature and natural resources in general and trees in particular.

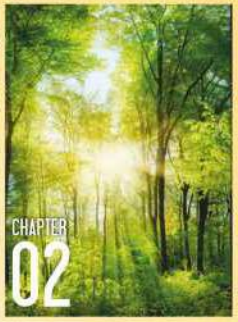
I am extremely grateful to **Shri V.P. Singh Badnore, Hon'ble Governor** of Punjab & the Administrator, UT Chandigarh for his continuous encouragement for preparing this comprehensive Action Plan. His concern for the people and environment of Chandigarh has been a constant source of inspiration to all of us. I am indebted to **Sh. Manoj Parida, IAS, Adviser** to the Administrator for his valuable suggestions, input & guidance for preparation of this Action Plan. I express my heartiest gratitude to **Sh. Arun Kumar Gupta, IAS,** Principal Secretary (Forests & Wildlife), Chandigarh Administration for the immense support and guidance in materializing this crucial plan. I am highly indebted to **Sh. Debendra Dalai, IFS,** Chief Conservator of Forests for his valuable inputs, consistent guidance and all possible support and efforts in the formulation of the current Action Plan.

सत्यमेव जयते

I am also thankful to other greening agencies including Executive Engineer (Horticulture), Engineering Department and Executive Engineer (Horticulture), Municipal Corporation for providing valuable information for the preparation this valuable document. I extend my sincere gratitude to other members of the Task Group specially **Sh. Pramod Sharma** of Yuvsatta (NGO), **Dr.Navtej Singh,** District Extension Specialist, PAU Extension Cell, Chandigarh for their valuable inputs & support in formulation of this significant Action Plan. I am also thankful my team members, **Sh. Davinder Chauhan, RFO Nepli, Sh. Parveen Yadav, RFO Chandigarh, Sh. Bhupinder Singh, Dy.RFO** and **Sh. Jatinder Singh,** Forester and especially **Sh. Rohit Kumar Saini,** Forester for the photographs and data from the field. I am also thankful to **Sh. Jatinder Verma** and **Sh. Ajay Kumar Gupta** & all Officers and Staff of Forest Department for their efforts to get this Action Plan prepared. The heartfelt thanks are for my supporting staff **Sh. Navdeep Bisht** and **Sh. Naveen Balhara** for their tireless efforts in arranging and coordinating with different resource groups. I shall also remain indebted to **Sh. Kulbhushan Kanwar** and **Sh. Narbir Kahlon** for the valuable inputs and Sh. Sachin Sharma of Youth Innovative Society (NGO) for being a partner in numerous forest related activities of the department.With valuable suggestions from all, I am sure this Action Plan would prove to be a great guiding document and another milestone in taking Chandigarh greenery to the next level and it will help people of Chandigarh in gifting a more green, more clean and pollution free healthy city.

Dr. Abdul Qayum, IFS
Deputy Conservator of Forest-cum-Member Secretary
Greening Chandigarh Task Group, Union Territory, Chandigarh

CONTENTS



CHAPTER 01 INTRODUCTION

Chandigarh is a well-planned city which was the designed on the instructions of first Prime Minister of India, Lt. Pt Jawahar Lal Nehru. Post the partition, it was built to give Punjab a Capital after Lahore as it was now a part of Pakistan. An ideal city exemplifying new era, freedom and birth of better future. Rated as one of the 'Wealthiest Towns' of India, Chandigarh is a self sufficient city with mix of service class, business class which is growing better with opening of educational institutes, industrial and Information Technology hubs.

Geography

Area: 114 sq km

Coordinates: 30.74°N 76.79°E

Climate: Humid subtropical climate

Seasons: Spring, Autumn, Summer, Monsoon, Winter

Temperature: −1 °C to 46 °C

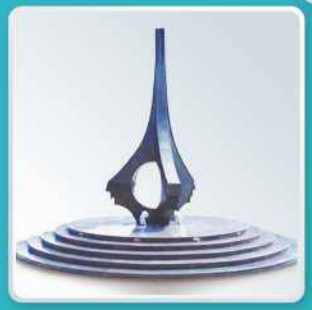
Average annual rainfall: 1110.7 mm

Demography

Population: 1,055,450 as per Census 2011

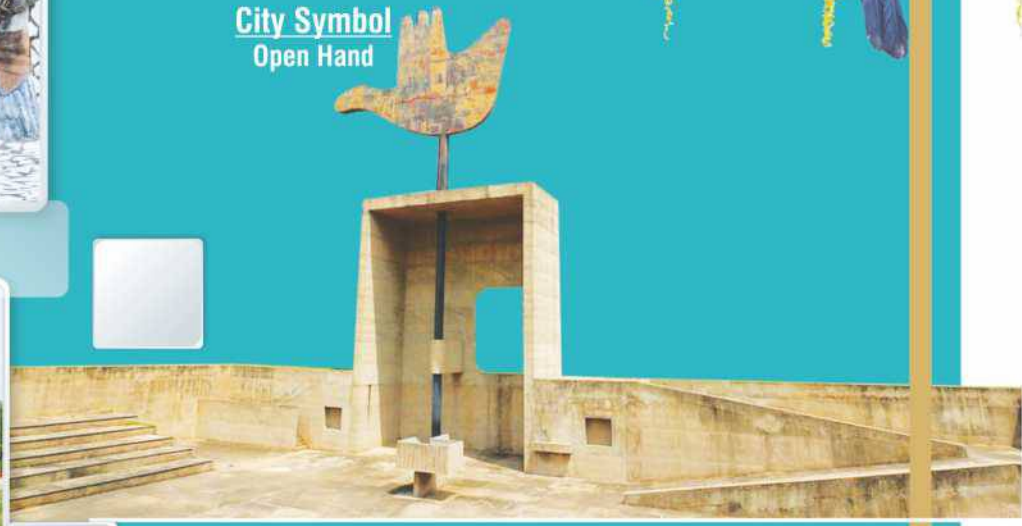
Languages: Hindi (73.60%), Punjabi (22.03%)

Landscape



City Bird
Grey Hornbill

City Symbol
Open Hand



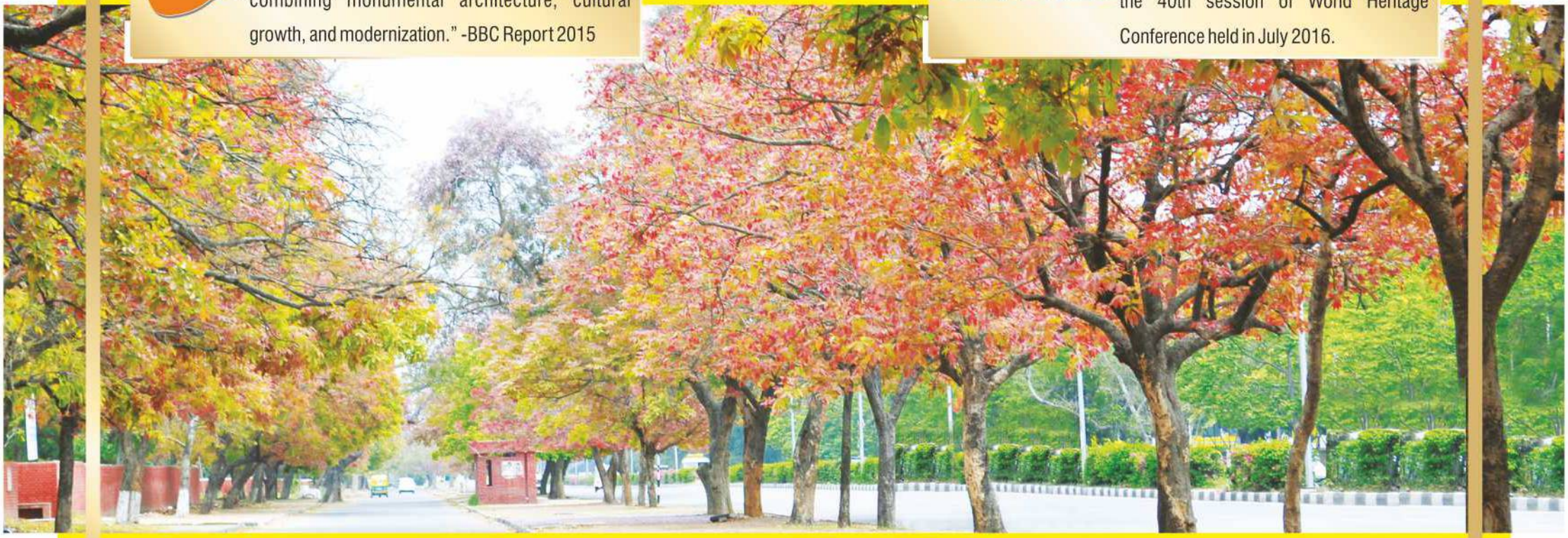
City Tree
Dhak

City Animal
Indian Grey Mongoose

The City Beautiful

"Chandigarh is one of the few master-planned cities in the world to have succeeded in terms of combining monumental architecture, cultural growth, and modernization." -BBC Report 2015

Chandigarh's Capitol Complex has been declared as World Heritage by UNESCO at the 40th session of World Heritage Conference held in July 2016.



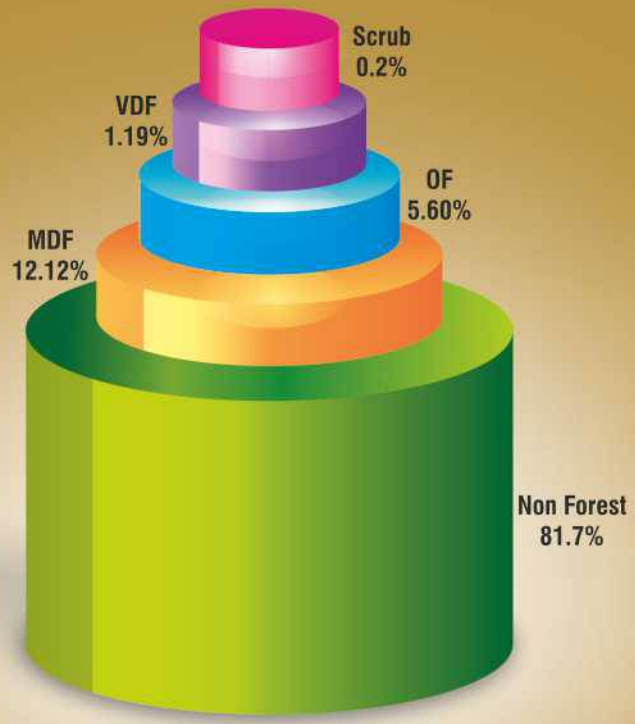
With dense Banyan, Ashoka, Cassia, Mulberry and Eucalyptus trees, Chandigarh is world's largest consciously landscaped city, significant for its planned green spaces and tree plantations. Avenues running between Sectors 7-8 and between Sectors 8-9 have beautiful Pilkhan trees and Kusum trees, respectively, on both sides thus forming a veritable 'green tunnel'.

In Chandigarh's landscape, there is a beautiful cycle of changing treescapes round the year. The first trees to blossom in early spring are the profusely flowering Simbal trees. These are followed by other flowering trees like Kachnars and Jacarandas and many others with lovely flowers. There is another fascinating phenomenon in spring, when some non-flowering trees shed leaves, followed by sprouting of new, pale green leaves.

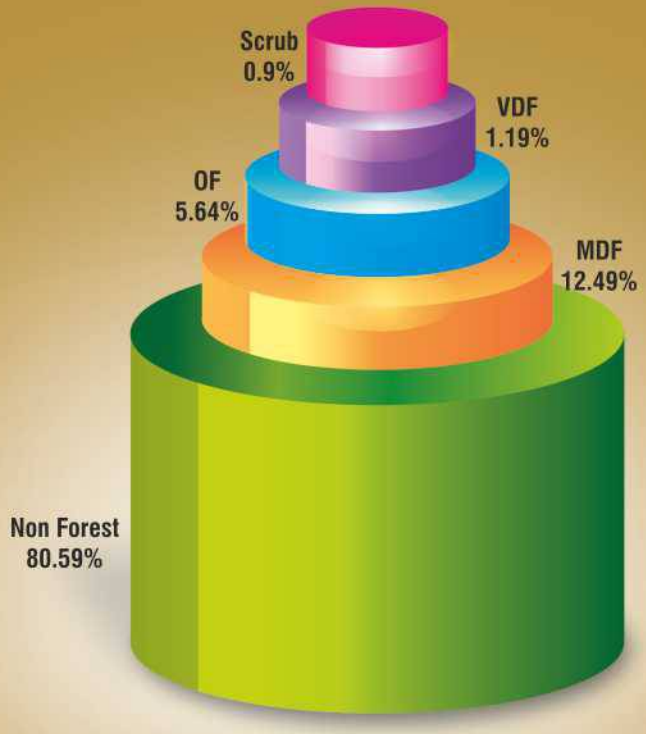
The rich greenery and strategically planted trees make Chandigarh a safe haven for wildlife species. Animals like Chital deer, Sambars, Barking deer, inhabit the green areas of Chandigarh. Carnivorous like Jackals, Mongoose, Pythons also constitute the food chain in this rich ecosystem. The city enjoys a huge range of avifaunal species like Parakeet, Woodpecker, Indian Grey hornbill, Barbet, Treepie and Peacocks that fly freely in the skies of the cities. The Parrot Bird Sanctuary Chandigarh provides a home to a large number of Parrots. Sukhna Lake hosts a variety of ducks and geese, and attracts migratory birds from parts of Siberia and Japan in the winter season. Sukhna Wildlife Sanctuary was declared a wildlife sanctuary in 1998.

Green Cover of Chandigarh, India State of Forest Report FSI, Dehradun

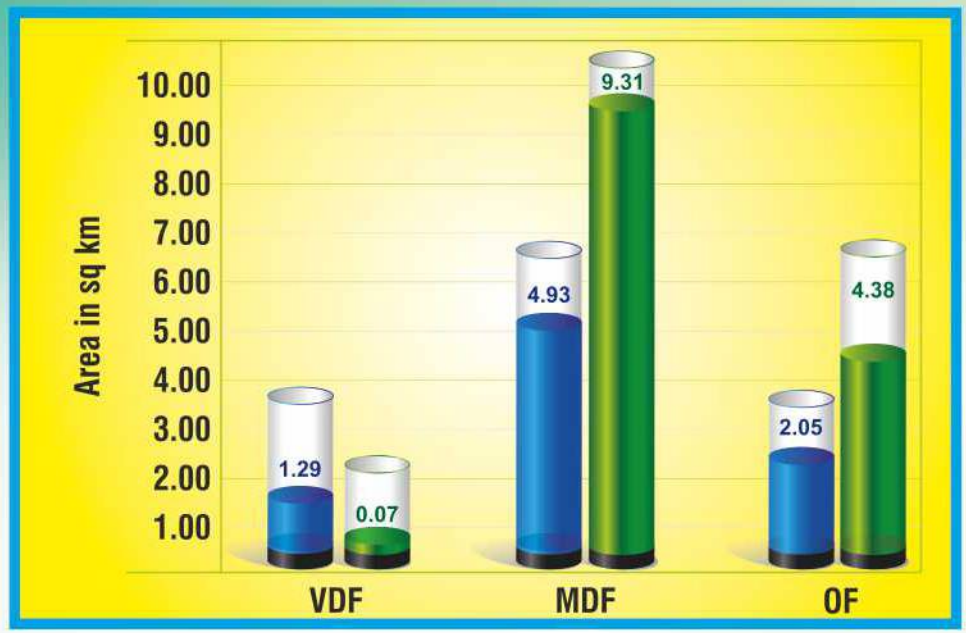
Forest Cover of Chandigarh in ISFR 2017



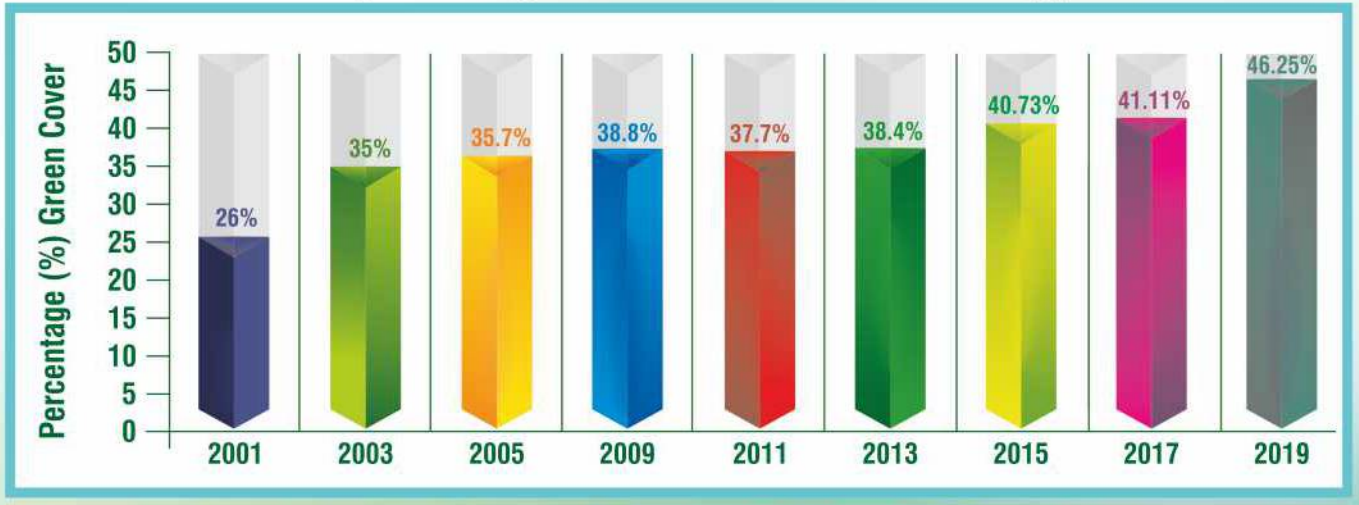
Forest Cover of Chandigarh in ISFR 2019



Forest Cover inside and outside RFA in Chandigarh, ISFR 2019



Percentage of Green Cover in UT Chandigarh (Including Sukhna Wildlife Sanctuary)



CHAPTER 02

GREEN CHANDIGARH ACTION PLAN 2020-21

Target Achievements

Greening Chandigarh is a common vision shared by the Department of Forests & Wildlife, UT, various institutions and the people of this city who come forward time and again to build the green side of Chandigarh. The combined efforts of all the parties lead to a strategic alliance that enables and facilitates the hard work, methodological contributions, scientific approach and anticipated results. Forest Department, Chandigarh Municipal Corporation, Engineering Department, Punjab University, several NGOs, Resident Welfare Associations, Educational Institutions & farmers have made it possible that the department has been able to set the annual targets as well as reach the finish line in flying colours. The accomplishment of these targets motivates the department to make constant efforts year on year.

Despite the worldwide pandemic in the year 2020-21, this alliance has been able to accomplish the plantation target of more than 2.55 lacs Saplings, 3 lacs of Patch-sowing and 3.20 lacs of stem cutting of Arundo-donax, the soil binder plant. Details can be seen in Table-1. The details of 111% target achievement follows:

Plantations' Achievements during 2020-21

S.No.	Department/ Organization	No. of saplings planted			No. of stem cuttings of Arundo-donax plants		No. of patch-sowing (seed sowing)	
			Target	Achievement	Target	Achievement	Target	Achievement
1-A.	Forest Department		70,000	74,500	3,20,000	3,20,000	3,00,000	3,00,000
1-B.	Municipal Corporation		50,000	92,763				
1-C.	Horticulture Division, Engineering Department		30,000	31,450				
2-A.	Free distribution of saplings by Forest Department to Educational Institutions, Religious Institutions, NGO's etc		65,000	66,588				
2-B.	Selling of saplings by Horticulture Wing of Municipal Corpn	1,05,000	15,000	- -				
2-C.	Selling of saplings by Engg. Department		25,000	18,134				
	Total	2,55,000		2,83,435	3,20,000	3,20,000	3,00,000	3,00,000

Factors that strengthen and shape the Greening Chandigarh Strategy:

Soil

In major parts of the city, the soil strata is a mix of clayey silt soils at the top layer that goes sandy to silty deep down. The soil in the Southern sectors is loamy to silt loam and in Northern area, it is sandy to sandy loam. There is wide spread distribution of clay, sand, pebbly sand and pebble layers in the area and interlayered sequences of clay and sand.

Soil Conservation

Soil conservation in Chandigarh is achieved by the method of Afforestation that constitutes direct seed sowing in contour trenches. *Arundo-donex* plantation along choe banks to train the choe and to stabilize the choe banks is one of its important aspects supported by indigenous species of trees, shrubs and grasses. Another strong approach is building & maintaining of check dams, spurs, revetments and brushwood structures for silt retention.

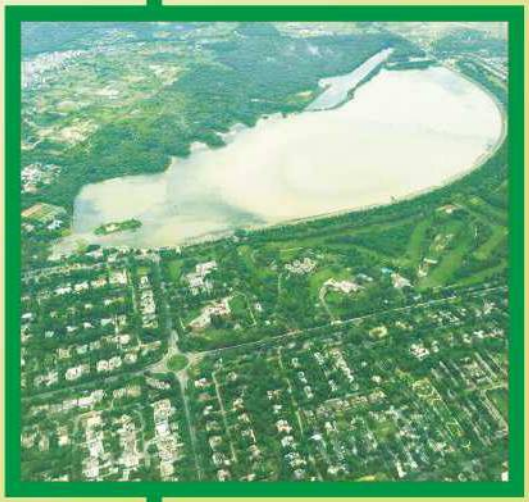
Floral Species

The soil, temperature and water cycle of Chandigarh support the flourishing of wide range of trees and shrubs. The prominent among them are : *Acacia catechu* (Khair), *Acacia modesta* (Phulai), *Acacia arabica* (Kikar), *Acacia leucophloea* (Raeru), *Dalbergia sisoo* (Shisham), *Anogeissus latifolia* (Chhal), *Azadirachta indica* (Neem), *Bombax ceiba* (Semal), *Butea monosperma* (Dhak), *Bauhinia racemosa* (Kachnar), *Emblica officinalis* (Amla), *Morus alba* (Tut), *Lannea grandis* (Jhingan), *Diospyros montana* (Kendu), *Murraya koenigii* (Kari patta), *Prosopis juliflora* (Musket), *Cassia fistula* (Amaltas), *Zizyphus jujoba* (Ber), *Tinospora cordifolia* (Giloe) etc. This is a strategic combination of seasonal herbal plants as well as those that support the ecological balance of the area.

Division & Delegation

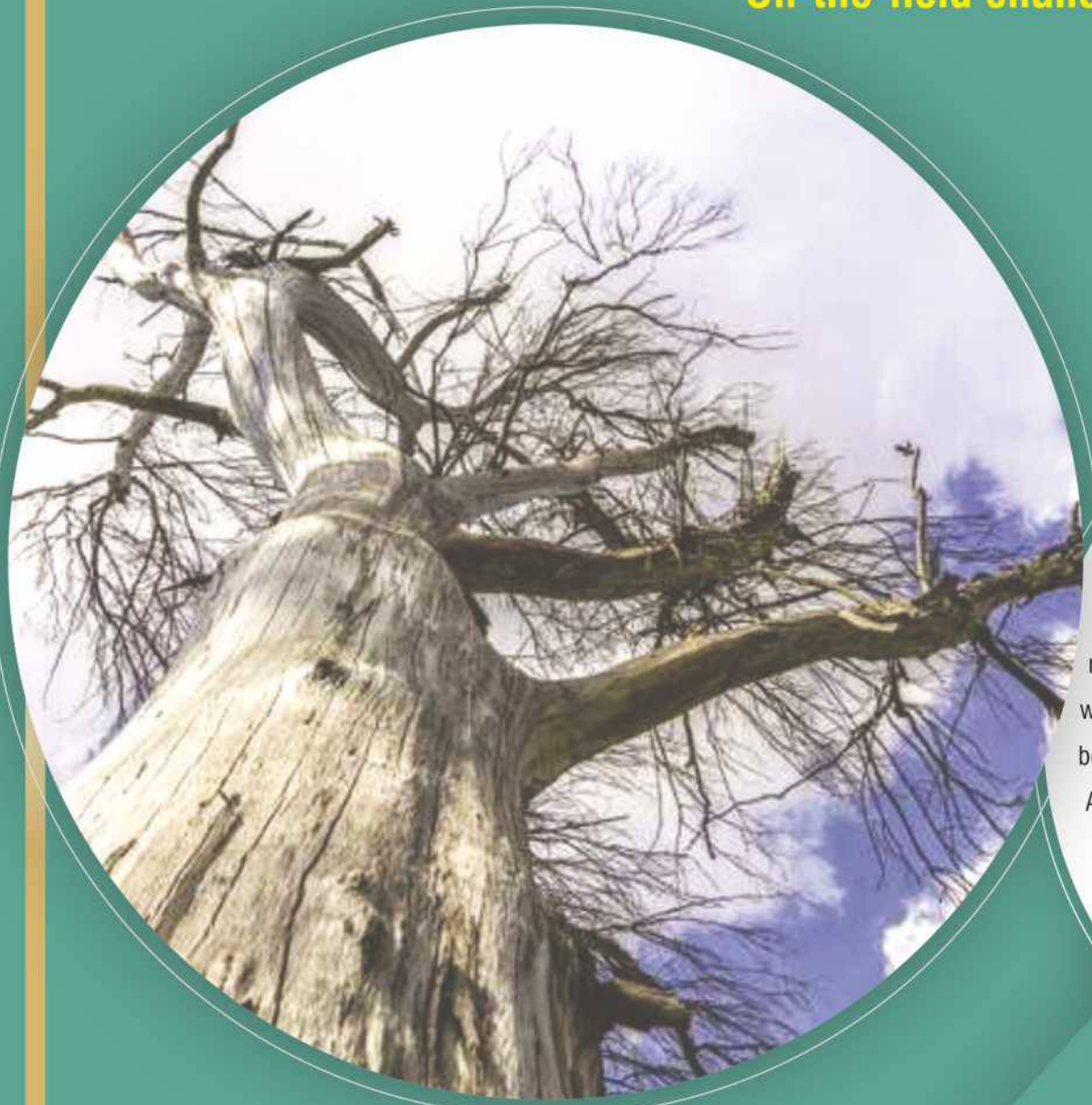
The huge target of saplings plantation, selling and distribution is divided into achievable numbers that are further assigned between the departments who take the ownership and accountability of this target achievement. These departments and organizations concentrate on the desired category of people, institutes or buildings which will be covered exclusively by them. It is essentially the secret behind the harmonious collaboration of departments like forest, horticulture and engineering.

Pocket Selection



Chandigarh city is a moderately vast city that is capable of giving food and shelter to approx. 11.48 lacs people. Sustaining the cost of the living can be toiling even for the geographical area as the stress of producing oxygen, clean environment, food, adequate water supply and aesthetic paradise. This, various areas have been identified and studied individually and are treated according to its specific needs. Thus, the plantation of plant species is a highly complex process.

On-the-field challenges



Dying and diseased trees

Eaten by termites and are in the process of dying, Chandigarh has trees that are deteriorating along the roadside as well in old parks. In addition to looking ugly, these trees are prone to uprooting and breaking during storms and attack/ spread of diseases etc. Therefore, such dead trees are to be replaced with ornamental and pollution mitigating species in consonance with the planned architect of the city. Identification of trees which are likely to be replaced in the next ten years is done and new plantation of species like Amaltas, Khair, Amla, Kadi Patta, Galoye, Bottle Brush etc is done. At the time of replacement planting, it should be ensured that saplings of same age group and same height are planted to provide an even look. Further, sufficient protection measures should be taken to avoid casualties, which normally results into gaps or uneven look to the avenue.

Irregular cutting

Irregular cutting of tree branches increases the possibility of insect infestation and disease infections at irregular cut. It also destroys the aesthetic beauty of the trees. Irregular cutting of tree branches in one direction destroy the shape of the tree canopy and presents an ugly look of the avenue. Pruning on one side makes the tree asymmetrical & it starts leaning towards the branched side & ultimately poses serious threat of getting uprooted. Pruning and other such operations must be done under the direct supervision of concerned Horticultural staff and the mechanized instruments should be used.

Species under the overhead electric lines and telephone lines

Trees like Pilkhan, Chukrasia and Bahera which grow upto 40 feet height pose a great threat when planted under electric lines which are hardly 15 feet above ground level. So, these trees require constant head back and heavy pruning and thereby giving non-aesthetic view to the road sides. Hence, these are to be replaced with species like *Putranjiva roxburghii*, Millettia, Moulsari *(Mimusops elengi)*, Lagerstroemia species, *Cassia javanica, Cassia nodosa, Barringtonia*, medicinal herbal shrubs etc as they are not that tall and can be given beautiful shapes by light pruning only.

Toxic and Parasitic Plants

Besides being allergic, *lantana* and *parthenium* are obnoxious weeds which adversely affect the growth of indigenous species. They have an adverse impact on the biodiversity as it kills all kind of undergrowth. Dodder, which is a parasitic vine, has also invaded a few trees in Chandigarh. It is a parasite which covers the whole foliage of tree and starves it of light and air. All greening agencies have been asked to remove these weeds at least twice a year to ensure proper growth of indigenous flora. Instructions have been given to Horticulture Wings of both Municipal Corporation and Engineering Departments to keep their respective areas clear of this weed.

Leaves burning

Despite the regular messages issued by the authorities regarding drawbacks of burning of dried leaves, many individuals choose to continuing the same. There have been many incidents where the fire became uncontrollable and emergency services handled the situation after the distress complaints and calls. Thankfully, no big accident has been reported in recent past. But the danger remains the grave. It has generally been seen that the dried leaves and other waste materials are burnt on road sides and also under the trees. Burning not only causes air pollution but also damages the live trees and affects their growth. Instead, these leaves can be utilized to make compost/vermi compost manure by mixing cow dung with leaves and putting them into big pits.

The Departments may utilize the compost/vermi compost manure for their nurseries and plantations for better and healthy growth of saplings.

Municipal Corporation may make efforts to introduce composting in nurseries and various other sites. Specific allocation of these composting sites may be done by the Departments/ Municipal Corporation on roadsides for collection and dumping of dry leaves in those pits. All institutions and households are requested to make compost/ vermicompost pit at their premises to convert dry leaves into compost or vermicompost which may be very useful for their kitchen garden. Municipal Corporation and Engineering Department will take strict action against officials/ individuals responsible for burning of leaves.

Pest attack on Trees

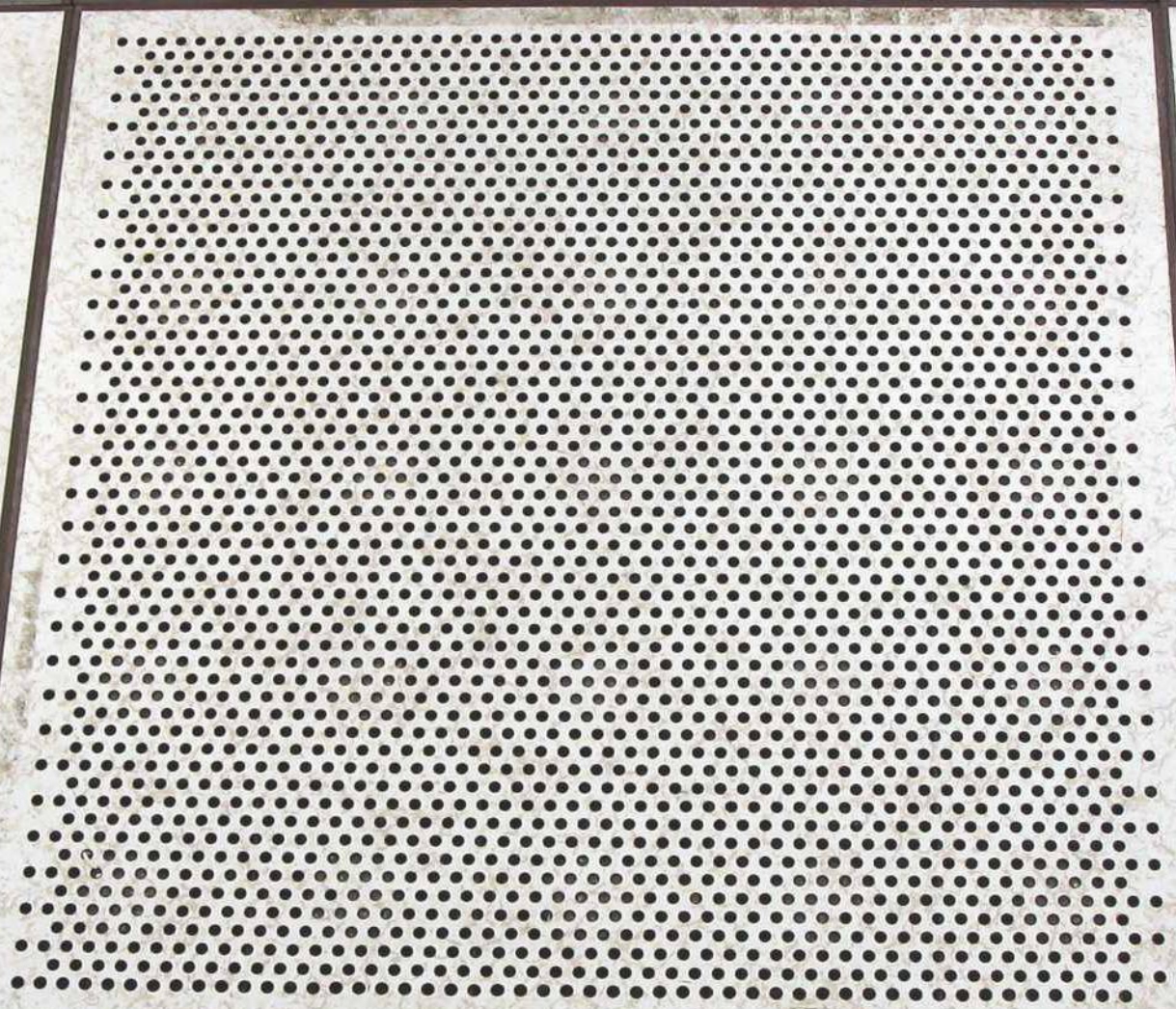
Sustained & concerted efforts of various agencies under the guidance of PAU Advisory service have been successful in combating the epidemic status of Mango mealy bug in UT Chandigarh, thus preventing a serious threat to a wide range of flora. Similarly, efforts are on to prevent stem borer attack on trees. Municipal Corporation and Engineering Department should complete the process of wrapping alkathene around tree trunk by 15th of December every year as this is the time for mealy bug nymphs to crawl up the tree. Similarly for stem borer, particularly for Arjun avenues, the solution of methyl parathion should be injected into the holes made by insects in the tree trunk and the holes be plugged with mud.

Concreting around the trees

Compaction of soil, concreting and tiling around tree trunk adversely affects its growth and life. This leads to tremendous damage to the trees as it reduces/ stops percolation of rain water into the sub soil and stops proper soil aeration of roots of the trees. There should be the gap of 6 ft. x 6 ft. around the tree trunk to ensure proper growth and long life in addition to recharging of underground water aquifer. Moreover, sufficient breathing space around tree trunks while doing pavements should be left on road berms, parking areas etc.

Ground Water Aquifers

It has been observed that the water table is going down in Chandigarh. This is primarily due to reduction in percolation of rain water. Rain water is lost due to surface run off as most of area is tiled or concreted in the form of parking, pavements, road berms etc. To recharge underground water aquifers, it is essential to reduce/ minimize surface run off. To achieve this, perforated tiles should be used in Parking areas & road berms wherever possible.



CHAPTER 03

THE REVIEW OF GREENING CHANDIGARH ACTION PLAN 2020-21

WORLD ENVIRONMENT DAY - 05TH JUNE, 2020

The World Environment Day is celebrated on 5th June every year to spread awareness about Environment and to sensitize people towards their duty to preserve and conserve environment. Every year a theme is declared to give attention to specific environmental problem. On this occasion Sh. V.P. Singh Badnore, Hon'ble Governor of Punjab & the Administrator, UT Chandigarh released the 'Greening Chandigarh Action Plan 2020-21'. Also attended Sh.Manoj Parida, IAS, Adviser to the Administrator, Sh.Arun Kumar Gupta, IAS, H.S.-cum-Principal Secretary Forests, Sh.A.K.Sinha, IAS, Finance Secretary, Chandigarh Administration.

Shri Debendra Dalai, IFS, CCF, Chandigarh informed that UT Chandigarh takes pride in having preserved about 46% of the total area under forest and green cover. Due to COVID-19 and prevailing lockdown condition, we have realized how the nature has started healing and made us realize how we can contribute in maintaining a balance in nature.

On this occasion, a ceremonial plantation was done at Nagar Van (City Forest) where saplings of Banyan tree, Neem, etc. were planted. Due to COVID 19 pandemic, various school students and general public were invited for online participation in the Poster Making, Repurposed Art, Poetry Contests. 970 students participated in different activities like Inter-School Short Mobile Video Contests, Poster Making, Repurposed Art Contest, Poetry Contests with the support of teachers and NGO – Yuvsatta. Other activities were also conducted i.e., 'Best out of Waste-Create anything from something', 'Create a Garden @ Your own Home', 'Vertical Garden from Waste Material'. Such activities brought awareness about environmental protection to encourage children about recycling, fighting global warming, cleaning up pollution and many other issues.

Online Green Quiz Competition was also held where more than 1100 students participated in the live green quiz contest.

VANA MAHOTSAV - 10TH JULY, 2020

Hon'ble Governor Sh. V.P. Singh Badnore planting a saplings at Raj Bhawan premises to celebrate Van Mahotsav

The word "Vana Mahotsav" refers to 'the festival of forests', which is celebrated every year, in the month of July, to inculcate among the general public the need for growing trees and nurturing them. To sensitize the citizens regarding the importance of tree plantation, Vanmahotsav-2020, the department launched planting of tree saplings at Forest Area on I.T. Park Road between Railway Light Point to Kishangarh village chowk in association with Central Reserve Police Force, Chandigarh wherein Sh. Debendra Dalai, IFS, Chief Conservator of Forests, in the presence of Sh. Randeep Sharma, Commandant, CRPF Campus, Dr. Abdul Qayum, IFS, DCF & personnel of CRPF and Forest Department, planted forestry saplings. On this occasion, other officers and officials also planted saplings there.

The Chief Conservator of Forests also flagged off a vehicle designed for free distribution of saplings by Forest Department, Chandigarh titled **"वन विभाग आपके द्वार"** (Forest Department at your Door Steps). This is the scheme of free distribution of plants/ saplings to general public without any formal application wherein denizens of the city can get plants upto five saplings free of any cost. These vehicles covered the city in span of 21 days in all the sectors for door-to-door distribution. The initiative has been taken to encourage people to plant more.

VRIKSHABANDHAN CELEBRATIONS - 3RD AUGUST, 2020

Rakshabandhan was celebrated with love extended for the nature by the Chandigarh residents. The activity by the forest department intended to share the emotion of care and commitment towards the nature where the citizens were to tie Rakhi bands to the trees. The activity successfully ran at two significant spots in the city, one of which was most sort after and most visited attraction – Sukhna Lake and the other was Botanical Garden, Sarangpur. Despite the fear of pandemic & selective lockdowns, the activity witnessed overwhelming participation from across the city as more than 1000 participants tied Rakhi on the trees and took the pledge to conserve the nature. To motivate and appreciate the participants for their involvement, the forest department conducted a lucky draw through which the winners were announced. These winners were invited to the forest department office in Sector 19 and were felicitated with prizes.

"We are delighted to receive the kind of response Vrikshabandhan had because it gives a sense of relief & like-mindedness between the department & general public towards conservation of nature which further motivates us to come up different such activities in future as well," said Sh. Debendra Dalai, CCF.

Rotaract Club of Chandigarh also supported Forest and Wildlife Department in the event. Rotaract Club of Chandigarh appreciated the initiative and participated enthusiastically. Many Rotaractors went to Sukhna Lake to show their support while others stayed home and tied Rakhi to the trees near their houses. A message to conserve and cherish the environment was successfully spread to the in the city through this event.

We are delighted to receive the kind of response Vrikshabandhan had because it gives a sense of relief & like-mindedness between the department & general public towards conservation of nature which further motivates us to come up different such activities in future as well.

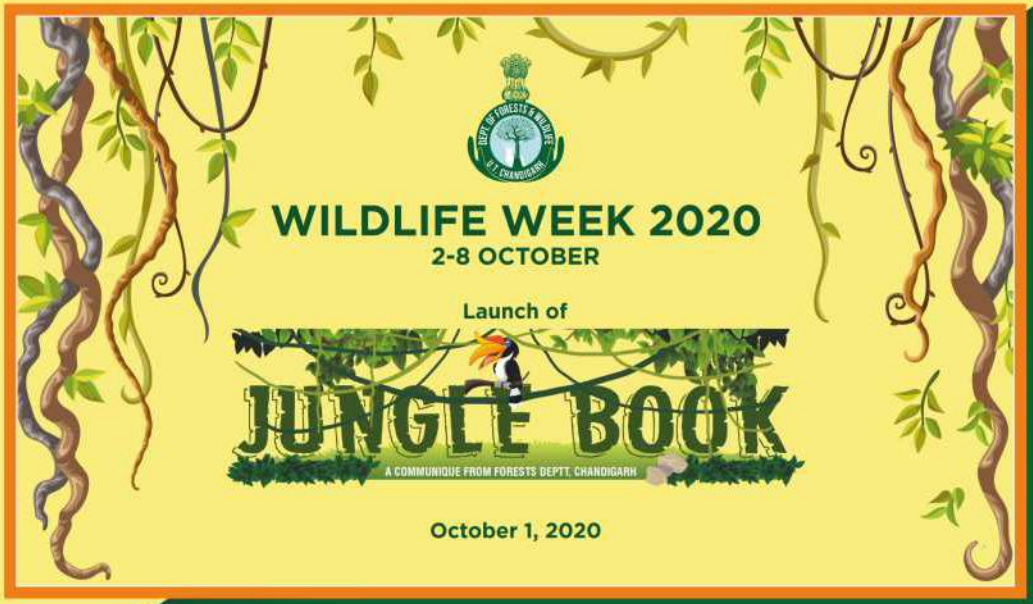
WILDLIFE WEEK

Wildlife Week is observed during the first week of October all over the country, with the objective of raising awareness among masses for conservation of Wildlife and its habitat. The Department of Forests & Wildlife, Chandigarh organizes various programmes during the week to sensitize and generate awareness among the masses for the Protection and Conservation of Wildlife, Nature and Natural resources.

LAUNCHING OF JUNGLE BOOK", THE DEPARTMENT NEWSLETTER - 01ST OCTOBER, 2020

Department of Forest & Wildlife, UT Chandigarh launched the Wildlife Week-2020. On this occasion, newsletter of the department was released by Shri Anant Pandey, IFS, Chief Conservator of Forests, Haryana. Titled "Jungle Book", the newsletter is a quarterly feature in the form of communiqué which contains variety of information like facts, events and important areas that need special mentions along with some interesting reads and columns.

The Chief Guest further informed that the activities of the department must have sensitized the stakeholders, especially the children to appreciate the beauty of the nature and to protect our valuable National treasure.



LAUNCH OF 'GROW YOUR OWN HERBS & FOOD CAMPAIGN' - 08TH OCTOBER, 2020

The 'Wildlife Week' was concluded on a positive note with the inauguration of Grow Your Own Herbs & Food Campaign by the Medicinal Plants Board, Chandigarh under Department of Forests & Wildlife of Chandigarh Administration in collaboration with Yuvsatta-an NGO. In this, a training programme was organized for Eco Club teachers at Botanical Garden, Sarangpur. Teachers from around 70 Eco Clubs of the city participated in the programme.

With initiatives of Medicinal Plant Board of Chandigarh, Herbal Gardens are established in almost all prominent Schools of the city. With ongoing Covid pandemic and Government of India's insistence on making people self-reliant (Atamnirbhar), this campaign is a step forward towards good health and self-reliance through active participation of Eco Clubs in Schools & Colleges. This intends to make young students the agents of change in this direction by growing own herbs and food by way of adopting new vertical urban farming techniques. These techniques enable utilization of less space and water consumed and get an organic produce of vegetables and fruits with green environment at minimal cost.

Senior resource persons like Dr. Madan Gulati, MD, Ayurveda with 40 years' experience of practice and Dr. Navtej Singh of Punjab Agricultural University shared with teachers about herbs, fruits and vegetables which can be easily grown at homes, in waste bottles, containers, buckets etc. The benefits of herbal plants were also discussed with the emphasis on growing them at homes and taking advantages of these pesticides and herbicides variety of these home-grown plants.

On this occasion, information books and seed-kits from Punjab Agricultural University were also distributed to all participants, besides tulsi plants which were also presented to take home.

AWARD CEREMONY OF BEST SHORT FILM ON 'WILDLIFE CONSERVATION' - 16TH OCTOBER, 2020

Best Short Film on 'Wildlife Conservation' submitted by the students of different eco-club schools of Chandigarh was the competition for which many entries were received. The aim was to trigger the thought process of Wildlife Conservation among young minds & to sensitize them toward wildlife heritage and conservation as well.

During the occasion, the shortlisted winners of various school students were felicitated with prize and mementos by Shri Debendra Dalai, IFS, Chief Conservator of Forest & Chief Wildlife Warden.

Further, the Department of Forest & Wildlife also felicitated the Wildlife Squad of the department for performing their duties 24x7 diligently towards rescuing and releasing of wildlife in distress to the Sukhna Wildlife Sanctuary, Chandigarh. Dr. Abdul Qayum, IFS, Deputy Conservator of Forests also attended the event alongwith the Eco-Club teachers of schools in Chandigarh.

LAUNCH OF MOBILE APP FOR WILDLIFE RESCUE - 28TH OCTOBER, 2020

The Department is having a 24x7 Wildlife Rescue Services for the U.T. Chandigarh. Any wildlife animals/birds distress/enterig human habitation & rescued by the Squad and released subsequently in their wildlife habitat. Approx. 600 are rescued every year. Mobile Based Application (App) for monitoring of wildlife rescue, reporting and release of the wildlife through online system was launched by Sh.V.P. Singh Badnore, Hon'ble Governor of Punjab & the Administrator, UT Chandigarh. Compatible to Android smart phones, this app is for the rescue of wildlife entering human habitation, reporting and its further release in the Wildlife Sanctuary, Chandigarh. Real-time Wildlife Rescue App is made with an objective to rehabilitate wildlife in distress in city areas, parks, reserved or protected forests in urban and rural settlements. Through this App, timely dissemination of information to the concerned authorities is possible for injured and distress wild animals in the city. With the help of this App, the location of the incident is also directly communicated, thereby making it easier and faster for the department to react to such call.

It is a step towards e-Governance in wildlife rescue where a user need not to call on the wildlife hotline number (0172-2700217) of the department but the same can be resolved in time bound manner and this has simplified the office process to a great extent. The link of the APP is also available on the department's website i.e. www.chandigarhforest.gov.in. In this App, all orders/guidelines/rules related to wildlife rescue have been uploaded by the department for general information of the public. Through this App, the public can click pictures of the wildlife in distress and can send the same to the concerned rescue squad directly for taking immediate action.

SOLARIZED CARTS LAUNCHED AT SUKHNA LAKE- 22 JANUARY, 2021

To enable the residents of Chandigarh to enjoy the breath-taking sight of Sukhna Lake, the Department of Forests & Wildlife launched two Solarised Carts. The step was taken so that more and more people can be educated towards the nature and birds of Sukhna Lake. Various species of migratory birds can be seen during the winters that can turn into a task if one wants to observe them. On this occasion, Sh. Debendra Dalai, IFS, Chief Conservator of Forests, informed that every year hundreds of Migratory Birds like Brahmi Ducks, Common Pochards, Red-Crusted Pochards, Geese, Shell Ducks, Marsh Ducks, Diving Ducks, Coots, Stilts, Hill Kingfisher, Mallard, Pintail, Cormorants, Siberian Ducks, Cranes, Storks, Sandpipers etc. travel thousands of miles to reach Sukhna Lake, to escape the harsh cold of their habitats. These migratory birds start arriving in the Sukhna Lake from early November and their stay lasts till March or April, depending on the climatic conditions.

The launch gives a new hope that many people will now no longer be deprived of watching them due to age or health conditions. These carts with solar energy battery operated system will provide free service to the specific set of people i.e. senior citizens, pregnant ladies, physically challenged persons or people with health problems at Sukhna Lake, Chandigarh. On this occasion, Sh. Manoj Parida, IAS, Adviser to the Administrator, in presence of Sh. Arun Kumar Gupta, IAS, Home Secretary-cum-Principal Secretary (Forests) and other senior officers of the Administration and general public, flagged off the launch.

It is a pollution-free service which sends the message of going green and opting environment safe renewable resources. To support the idea, the worthy advisor presented cotton bags to the public to make general public aware about the adverse effects of plastic carry bags. Cloth bags were distributed by the Chandigarh Pollution Control Committee to promote ban on single-use plastic.

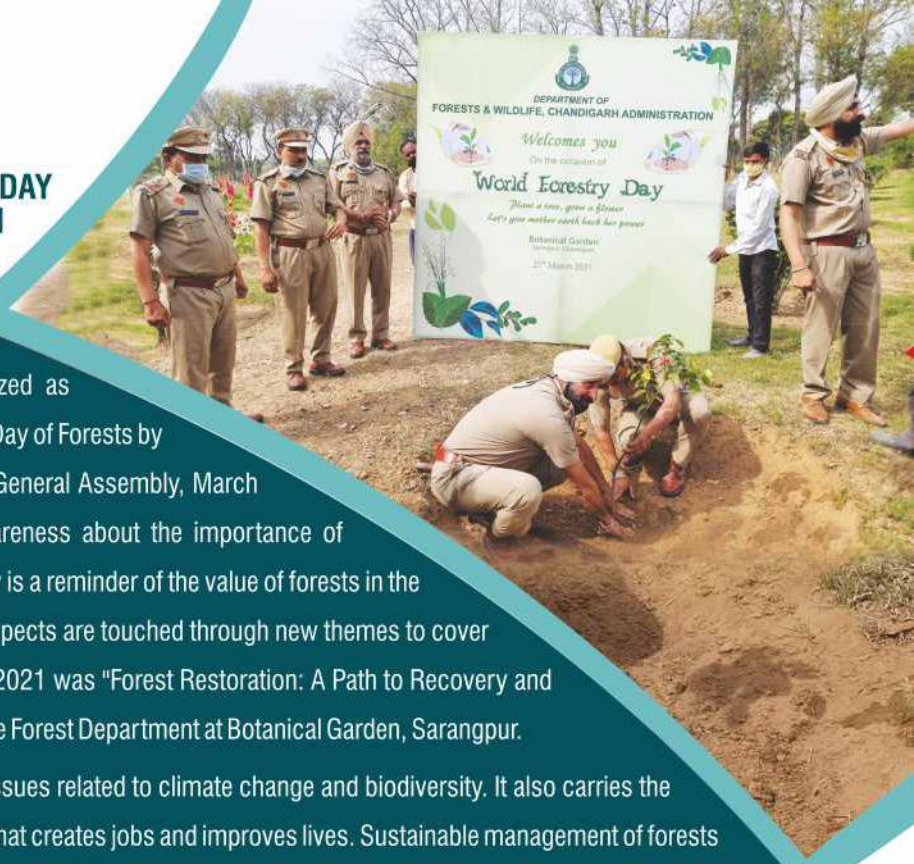
Among the prominent members attended the event were Sh. Mandip Singh Brar, IAS, Deputy Commissioner, Dr. Abdul Qayum, IFS, Deputy Conservator of Forests and Sh. Rajiv Tiwari, Director Public Relations.

ECO DEVELOPMENT PROGRAM - 16 MARCH, 2021

Community participation plays an important role in forest management to ensure protection and management of the forests by making social fencing. In order to involve the local community in protection and management of the forests in general and the Sukhna Wildlife Sanctuary in particular, an Eco-Development Programme was organized on 16th March, 2021 at Kansal Gate of Sukhna Wildlife Sanctuary. At the program, the villagers were informed and made aware about the impact of human activities on the forests and the ways to curb obliteration of forests. The villagers were informed about their role and responsibility towards the conservation of forests. During the event, Pressure Cookers were distributed to families of Khuda-Ali-Sher and Kaimbwala village so as to motivate them towards energy efficient cooking and lessening of direct dependency on fuel wood.

Sh. Debendra Dalai, IFS, Chief Conservator of Forests, UT Chandigarh was the Chief Guest on this occasion. Among prominent persons who attended the event were Sh. Hakam Singh, Ex-Sarpanch, Khuda Ali Sher, Sh. Sonu, Ex-Sarpanch, Kaimbwala, Sh. Praveen Yadav, Range Forest Officer, Chandigarh, Sh. Devender Singh Chauhan, Range Forest Officer, Nepli along with other field staff of the department.

WORLD FORESTRY DAY
21 MARCH, 2021



Recognized as International Day of Forests by The United Nations General Assembly, March 21 is the day to raise awareness about the importance of forests and their restoration. This day is a reminder of the value of forests in the lives of living creatures. Each year, different aspects are touched through new themes to cover the vastness of the forests. In that series, the theme for 2021 was "Forest Restoration: A Path to Recovery and Well-being". A ceremonial plantation programme was organised by the Forest Department at Botanical Garden, Sarangpur.

The restoration and sustainable management of forests can help in addressing the issues related to climate change and biodiversity. It also carries the potential to produce goods and services for sustainable development, fostering an economic activity that creates jobs and improves lives. Sustainable management of forests along with the judicious use of their resources is the primary way to combating climate change and contributing to the prosperity and well-being of present and future generations. Forests have an important role to play in poverty eradication and in the achievement of the Sustainable Development Goals (SDGs).

Though forests provide us with unmeasured ecological, economic, social, and health benefits, still global deforestation continues at an alarming rate. Therefore, it becomes necessary for everyone to act in a responsible way and spread consciousness about the importance of saving Forests on global Forests Day 2021.

On International Day of Forests, countries around the world are undertaking efforts to conduct activities for forests and trees, such as tree-planting campaigns.

SHORT MOBILE CONTESTS ON MEDICINAL AND AROMATIC PLANTS OF CHANDIGARH- 30.03.2021

In order to keep the children engaged during the COVID-19 pandemic situation & involve them in some green activities. Medicinal Plant Board, UT Chandigarh in association with the Yuvsatta-NGO organised a Short Mobile Video Contest on "Medicinal & Aromatic Plants of Chandigarh". Participants from over 20 prominent Schools and Colleges of the city participated in the contest. The winners of the contest were felicitated in a small function following necessary COVID norms.

Addressing the winners on the occasion, Sh. Dalai shared that medicinal plants have long been utilized in traditional medicine and worldwide. "India's wealth of medicinal plant species has been used in traditional Indian health systems for millennia. Fortunately, we find them in abundance across hundreds of acres of forest land and city sectors in Chandigarh. It won't be wrong to call Chandigarh as Medicinal Plants City. No wonder, the city denizens are greeted by these old, loyal friends, the trees, who give them lifesaving gifts across the sectors. And there is a need to promote the medicinal plants and herbs to save the human lives".

> **India's wealth of medicinal plant species has been used in traditional Indian health systems for millennia.**

AWARDING OF COMMENDATION AWARD ON THE EVE OF REPUBLIC DAY,2020

On the occasion of Republic Day, Shri Jatinder Kumar Verma, PA of Forest Department was awarded with Commendation Award for his commendable work in the Forest Department for last 27 years.


HOME IS WHERE
THE NATURE IS

CHAPTER 04

TREE FELLING RULES IN CHANDIGARH

The Chandigarh Trees Preservation Order- 1952

In exercise of the powers conferred by section 11 of the Capital of Punjab (Development and Regulation) Act, (President's Act V of 1952), the Chief Administrator is pleased to make the following Order:-

1. Title and extent

A. This Order shall be called the Chandigarh Trees Preservation Order, 1952.

B. It shall come into force at once.

2. Definitions: In this Order, unless there is anything repugnant in the subject or context,-

A. "Operational land" means land which is used by public service undertakers for the purpose of carrying on the undertaking of such undertakers.

B. "Owner" includes a mortgagee with possession.

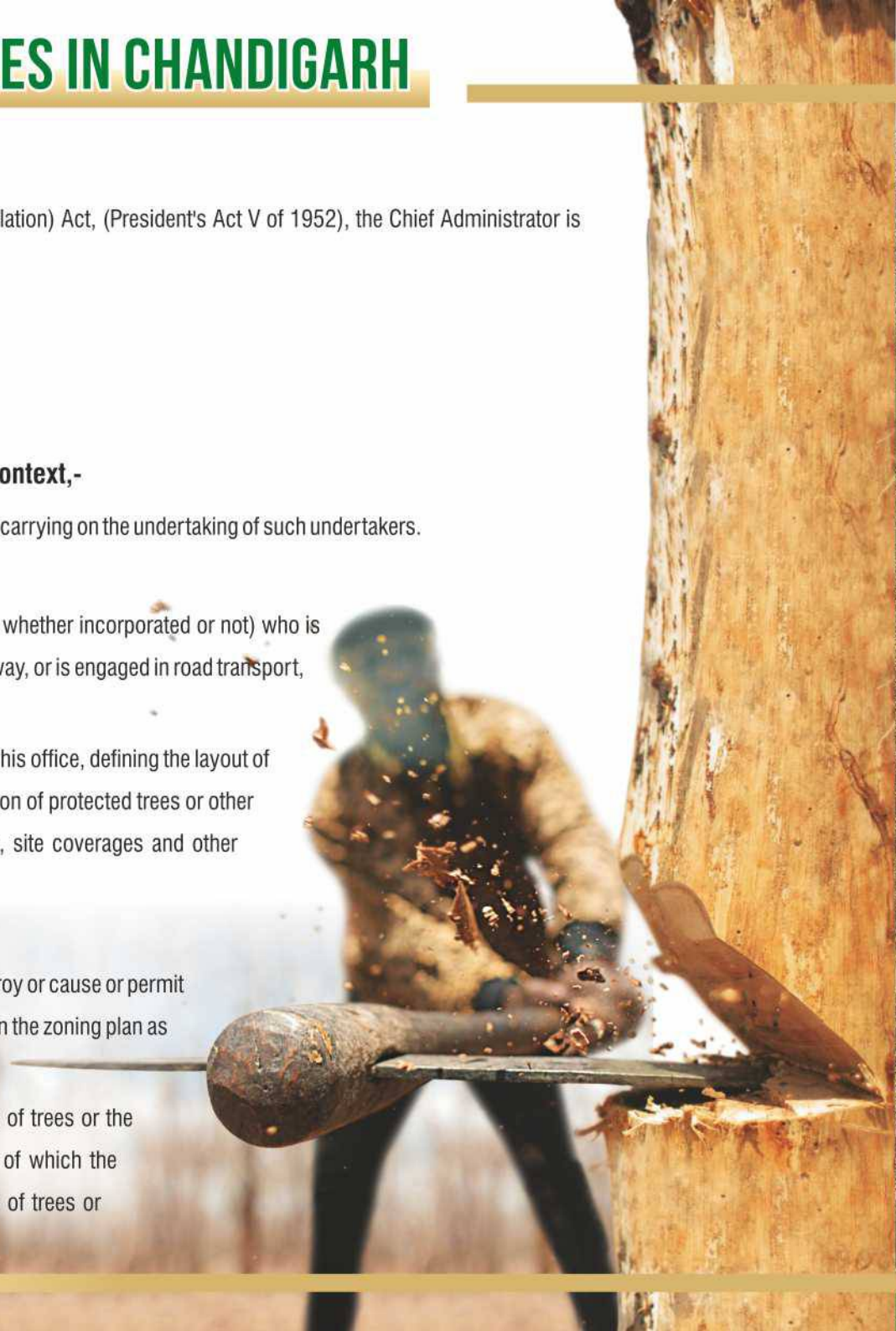
C. "Public service undertakers" means a person (including a firm or other body of individuals whether incorporated or not) who is carrying on or is authorized to carry on any public utility service including a railway, light railway, or is engaged in road transport, water transport, disposal of waste, or in the supply of electricity or water.

D. "Zoning Plan" means the numbered plan authenticated by the Chief Administrator and kept in his office, defining the layout of any numbered sector showing the streets, boundaries of building sites, open spaces, position of protected trees or other features and showing the specified land, building lines, permissible heights of buildings, site coverages and other restrictions on the development of land or buildings.

3. Application:

A. No person shall, except with the permission of the Chief Administrator, cut down, lop or destroy or cause or permit the cutting down, lopping or destruction of any tree in any part of the woodland area shown in the zoning plan as "protected trees" or in "protected woodland areas".

B. An application under sub-clause (i) shall be in writing and shall specify the trees, groups of trees or the woodland area to which the application relates, and the operations for the carrying out of which the permission is required; and where necessary, for the identification of such trees, groups of trees or woodland area, shall be accompanied by a map or plan on a scale of 1" to 80".



4. **Permission or refusal:**

   A. The Chief Administrator may grant such permission either unconditionally or subject to such conditions (including conditions requiring the replacement of any one tree by one or more trees of the same or a specified kind on the site or in the immediate vicinity thereof, as he may deem fit, or he may refuse permission.

   B. Where the Chief Administrator refuses permission under this Order or grants such permission subject to conditions, he shall, when refusing or granting permission, certify that in respect of any trees, groups of trees or any woodland area for which he has so refused or granted permission, he is satisfied that:

   (a) refusal or permission is in interest of forestry, or (b) in case of woodland area, it has amenity value in relation to woodland character of area, or (c) in case of trees or groups of trees, trees have an outstanding amenity value for offering shade to building or roads, or (d) there is any other special amenity provided by trees or woodland area.

5. **Register of applications** - Chief Administrator shall maintain a register of applications containing information as to the nature of application, name of the applicant, the decision thereon and any directions as to the replanting of the trees and every such register shall be available for inspection by public during office hours.

6. **Applications deemed to have been sanctioned** - Application made under clause 3 of this Order shall be deemed to be sanctioned if a decision thereon is not conveyed to the applicant within one month of the receipt of the application by the Chief Administrator.

7. **Register of trees** - Protected trees, groups of trees or woodland areas shall be listed by the Chief Administrator in a register.

8. **Numbering of trees** - All protected trees or groups of trees or woodland areas shown on the zoning plan or listed in the register of trees shall bear a number corresponding to its number in the register of trees.

9. **Replanting** - Where permission is granted under this Order or otherwise, the Chief Administrator may give directions to the owner of any site as to the planting or replanting of any trees or kinds of trees. Any such directions may include requirements as to-

   (a) species of trees. (b) planting distances. (c) the erection and maintenance of fencing necessary for protection of the planted or replanted trees. (d) the preparation of ground, drainage, removal or brushwood, lop and top; and (e) protective measures against drought or fire.

10. **Exemptions - This Order shall not apply to -**

   A. the cutting down, topping or lopping of any tree in an operational land;

   B. for normal forestry operations in young plantations such as weeding, brushing and high pruning;

   C. the usual pruning or trimming of a tree from time to time.

PRUNING OF TREES UP TO 90 CM OF GIRTH CLASS

The competent authority in respect of pruning of trees upto 90 cm of girth class in Chandigarh shall be Executive Engineer (Horticulture), Municipal Corporation and Executive Engineer (Horticulture), Engineering Department, UT, Chandigarh as per their area of jurisdictions.

The concerned Executive Engineer should make a pruning plan for all types of pruning i.e. under competence of aforementioned authority before monsoon and during winter season so that such dangerous/ over grown branches can be removed well in time for safeguarding life, property and tree themselves. A record of pruning done shall be maintained by Executive Engineer concerned including before and after photographs.

The pruning of trees should be carried out in a scientific and symmetrical way instead of just carrying out pruning on one side.

This is issued with the approval of Worthy Advisor to the Administrator, UT Chandigarh.

PROCEDURE FOR FELLING OF TREES IN CHANDIGARH

For dead & dry trees:-

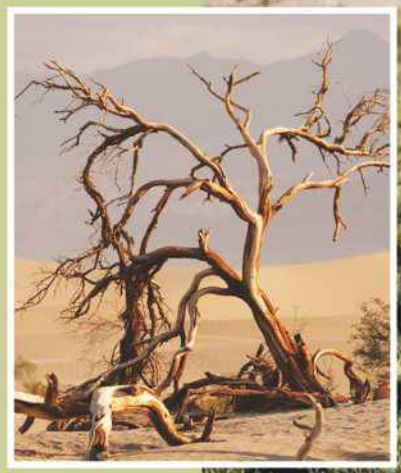
Two officials of following rank/ designation from 2 different departments shall certify that the tree in question is dead & dry and is required to be removed immediately:-

A. SDO (Horticulture) of Municipal Corporation / SDO (Hort.) of Engineering Department, Chandigarh, as the case may be, as per their area of jurisdiction.

B. Range Forest Officer (RFO), Chandigarh Range.

In case of dead & dry tree felling proposal from Forest Department besides Range Forest Officer concerned, SDO (Hort.) of Engineering Department shall certify jointly along with RFO.

Once it is certified by two officials that the tree is dead & dry, the concerned Head of Department i.e. Chief Engineer, UT Chandigarh or Chief Conservator of Forests or Commissioner, Municipal Corporation, as per their area of jurisdiction, shall be the authority to accord approval for removal of dead & dry trees.



For felling of Green Trees

The present system of getting approval from the Advisor to the Administrator, UT, Chandigarh for felling of green trees shall be continued without any change.

Trees posing immediate threat to life and property:

In such cases also, two officials of different departments, as in the case of dead & dry tree, shall certify in writing after inspection that the "tree in question is dangerous for human life and property and required to be removed immediately to save life & property".

Following guidelines while felling of trees are to be followed by all departments:

A. The concerned department i.e. Municipal Corporation, Chandigarh or Engineering Department or Forest Department shall also ensure that minimum 5 trees are planted in compensation to removal of one dead & dry tree with the condition that at least one tree should immediately be planted at the place where this dead & dry tree has been removed.

B. It has also been observed that even after approval of Competent Authority for removal of trees, replacement of tree is taking place at some other place. It is, therefore, desirable that at least one sapling should be planted immediately at the same place after removal of the tree, if there is a possibility in terms of space etc.

C. Municipal Corporation/ Engineering Department/ Forest Department to ensure that trees which are being planted in re-plantation should be of same species that are planted as part of City Urban Planning/ Heritage and not of any other species.

D. Once the permission for dead/dry tree has been given by the competent authority, the concerned Department should take immediate steps to remove it, so as to save life & property. It is advisable that a Rate Contact for cutting of trees should always be in place so that once permission to cut dead/ dry tree is given, it is removed immediately without loss of time.

CHAPTER 05 GREENING CHANDIGARH ACTION PLAN 2021-22

The Greening Chandigarh Action Plan 2021-22 is an effort to address the city's challenges of rapid urbanization by integrating sustainable urban development & environmental planning. By focusing on the 3Es - Economy, Environment and Equity, the plan provides the framework for Chandigarh to become a greener and cleaner city.

The objective of the plan is to ensure that Chandigarh evolves as a city that has built conditions for environmental sustainability, so that it will be inherited by future generations who will gain benefits from it in the long-run. The plan summarizes the initiatives and measures to implement the plan.

PLANTATION TARGETS FOR THE YEAR 2021-22

S.NO.	Department/ Organization	Saplings to be planted (in Nos.)	Seed Sowing in Plants (in Nos.)	Stem Cutting (in Nos.)
1. A	Forest Department	75,000	3,00,000	3,20,000
1. B	Free Distribution	80,000		
2. A	Engineering Department (Hort. Div.) (Plantation)	40,000		
2. B	Distribution/ Sale of Plants	15,000		
3. A	Municipal Corporation, Chandigarh (Plantation)	60,000		
3. B	Distribution/ Sale of Plants	10,000		
	Total	**2,80,000**	**3,00,000**	**3,20,000**

Free distribution of seedlings of Mango, Neem, Jamun, Arjun, Kusum, Peepal, Kachnar, Amaltas, etc. and Medicinal & Herbal plants by Forest Department to Educational Institutions, NGO's, RWAs, local residents/farmers, Religious Institutions & other organizations.

Selling of fruit & ornamental trees on subsidized rates by the Horticulture Wing of the Municipal Corporation (10000) and and the Engineering Department (15000).

HIGHLIGHTS OF 'GREENING CHANDIGARH ACTION PLAN' 2021-22

1. During the Monsoon season, 2,80,000 saplings will be planted in a phased manner by various Departments over places like Sukhna Wildlife Sanctuary, Reserved Forests, Roadsides and central verges, Parks, Green belts, Community land, Government offices, Residential Complexes, Markets and in other available open spaces.
2. Department of Forests and Wildlife will be sowing 3,00,000 seeds of various forestry species on eroded hill slopes in Wildlife Sanctuary Area and blank patches of Reserve Forest Area.
3. Plantation of Fruit bearing species in Sukhna Wildlife Sanctuary, Reserve Forest Area & City Forest Area.
4. Planting of 3,20,000 stem cuttings of *Arundo donax* (good soil binder) along choe banks to stabilize them against soil erosion in the catchment area of Sukhna Lake.
5. Plantation drive will be organized in the Schools, Colleges, Residential Colonies, Villages, Hospitals and other public and private lands as a part of 'Van Mahotsava' celebrations during the month of July-August, 2021.
6. The Paudh Mela will be organized at the Lake Club Parking area near Sukhna Lake during the inauguration of Van Mahotsava-2021, where stalls of Forest Department & Horticulture Wings of Engineering & Municipal Corporation, Chandigarh will be installed for distribution of Seedlings from a common place on the onset of monsoon.
7. Planting of hardy, shade bearing, long living and pollution abetting species in the locations identified for having more pollution, particularly on the roadsides.
8. Establishment of Herbal Gardens in Schools, Colleges and other Institutions.

9. Replenishing and conserving the biodiversity of nature spots like Reserve forests, green belt, Sukhna Wildlife Sanctuary and Sukhna Lake by removing obnoxious weeds and planting/ introduction of indigenous palatable species.
10. Post planting care by ensuring proper protection and regular watering will be done by all three greening agencies & public.
11. A selection of shrubs or dwarf species for plantation under the electric and telecom transmission lines.
12. Treatment of the termite infested trees as per the expert advise of the scientists of the Forests Research Institute (FRI), Dehradun, Uttarakhand.
13. Awareness generation programmes will be organized to sensitize the masses for protection and conservation of flora and fauna.
14. Programmes to include information on various insect & pest diseases occurring on major tree species along with their control measures.

COLLECTION OF MANGO SEEDS
A UNIQUE CONSERVATION ATTEMPT

Department of Forests and Wildlife, Chandigarh has come up with a unique idea of collecting mango seeds from the residents. This is an effort to involve people in the plantation drive to save the environment. Such initiatives will enhance the sense of belonging and participation of people towards conservation of nature.

The residents just need to put dry mango seeds into the seed boxes and the department will collect them. The seeds will be nurtured by the department and the surviving saplings will be planted next year during the plantation drive. The department has placed bins at the Botanical Garden near Sarangpur village.

DEPARTMENT OF FORESTS & WILDLIFE CHANDIGARH ADMINISTRATION
DETAILS OF PLANTATION TARGET FOR THE YEAR 2021-22

S.No.	Chandigarh Range	Target (No. of Sapling)			Species to be Planted		Seed sowing in patches
		Trees	Shrubs	Stem Cutting			
1.	Sukhna Wildlife Sanctuary i.e. Barotiwala and Kansal Block	20800	5000	800 RMT	Amaltas	Kikar	1,50,000
2.	Lake Forest	4900	1000	—	Arjun	Lagerstroemia	
3.	Patiala-ki-Rao Forests	4400	2000	—	Bougainvillea	Neem	
4.	Southern Sector	2500	2000	—	Jamun	Papri	
5.	Botanical Garden	750	750	—	Jungle Jalebi	Semal	
					Kachnar	Shisham	
					Kaner	Toot	
	Total	33,350	10,750	800 RMT	Khair	Hibiscus	1,50,000

S.No.	Nepli Range	Target (No. of Sapling)			Species to be Planted	Seed sowing in patches
		Trees	Shrubs	Stem Cutting		
1.	Piplanwali & Ambika beats	3000	1000	140000	Khair	
2.	Tootan wali beat	3000	1000	70000	Jamun	
3.	U/Lower Nepli beats	5400	2000	90000	Knar	
4.	U/Lower Ghareri beats	4000	2000	140000	Kikar	1,50,000
5.	Manimajra beat	7150	2000	—	Jungle jalebi	
6.	Hallomajra beat	4250	2000	—	Papri	
					Shisham	
	Total	26800	10000	440000	Pokhan	**1,50,000**
	Grand Total	**60,150**	**20,750**	**4,40,800**	Falahi	**3,00,000**

OFFICE OF THE EXECUTIVE ENGINEER, HORTICULTURE DIVISION NO.1, M.C., CHANDIGARH

TREE PLANTATION TARGETS FOR THE YEAR 2021-22

S.No.	Area	Targets		
		Trees	Shrubs	Total
1.	Northern Sectors Parks	640	2400	3040
2.	Southern Sectors Parks	1010	7700	8710
3.	Green belts Sector 1 to 11, 15 to 19, 20, 21 to 25, 26 to 35, 36 to 38, 38 West, 39 to 42, 43 to 52, 56, 60, 61, 63, Cactus Park, Ram Darbar, Maulijagran, NAC Manimajra & Maloya	1165	12740	13905
4.	Nallah (N' Choe) Sector 3, 10, 16, 23, 36	230	660	890

5.	Community Centers	566	1585	2151
6.	Rehabilitation Colonies	416	1996	2412
7.	City Centre Sec 17 & 34	145	240	385
8.	Plantation in Gardens	489	3565	4054
9.	Northern Sector Roads (V3 to V6)	270	7200	7470
10.	Southern Sector Roads (V3 to V6)	1133	12000	13133
11.	Parks in Modern Housing Complex Manimajra, Central Park, Maulijagran	275	1100	1375
12.	Plantation in Sahaj Safai Kendras (SSK's) Sec 4, 9, 11,15, 16, 18, 19, 20, 21 to 24, 33 to 35, 43 to 45, 49 to 52 & 61	60	60	120
13.	Mango Garden Sec. 1, 28 & 29, Chd & Ind. Area Ph.I, II, Rajindra Parks (Mango Garden)	265	--	265
14.	Villages- Kishangarh, Makhan Majra, Maulijagran Pind, Khuda Lahora, Dhanas, Sarangpur, Khuda Ali Sher, Kaimbwala, Palsora & Khudda Jassu	500	1655	2155
	Total	**7164**	**52901**	**60065**

PLANTATION TARGETS FOR EDUCATIONAL INSTITUTIONS AND OTHER DEPARTMENTS/ ORGANIZATIONS FOR 2021-22

Organization/Institution	
Free distribution of Saplings by Forest Department, Chandigarh. Selling of saplings on subsidized rates by the Horticulture Wing of Municipal Corporation, Chandigarh. Engineering Department, Chandigarh to various Schools, Colleges & other educational Institutions, Medical Institutions, Market Associations, N.G.O.'s, RWAs, Rotary Club, Lion's Club, Farmers, Individuals etc.	
Plantation Target (Trees/Shrubs/Herbs/Medicinal Plants)	**1,05,000**

TIMELINE FOR PLANTATION TARGETS IN GCAP 2021-22

S.No.	Department/ Organization	Number of Saplings				
		No. of Saplings as per GCAP target	1st Quarter (April, May & June)	2nd Quarter (July, Aug & Sept)	3rd Quarter (Oct, Nov & Dec)	4th Quarter (Jan, Feb & March)
1.	**Forest Department**	(No.)	(No.)	(No.)	(No.)	(No.)
	Saplings' Planting	75,000	Pit Digging	75,000	—	—
	Stem-cutting	3,20,000	—		—	3,20,000
	Patch-sowing/Seed sowing	3,00,000	Pit Digging	3,00,000	—	—
	Free Distribution of saplings	80,000		Throughout the year		
2.	**Municipal Corpn.**					
	Saplings' Planting	31,970	—	19,252	9,521	3,197
	Saplings' Selling	—	—	—	—	—
3.	**Horticulture Divn. Engineering Department**					
	Saplings' Planting	35,000	5,225	15,410	8,650	5,715
	Distribution/Selling of saplings	—	—	—	—	—

CHAPTER 06

STRATEGIES FOR IMPLEMENTING THE GREENING ACTION PLAN 2021-22

MOTIVATING PEOPLE TO PLANT TREES

The main objective of this exercise is to motivate people to plant trees, to increase awareness among the citizens, particularly the students, about the importance of trees by inculcating tree consciousness among the citizens, to create a sense of responsibility among people to nurture and look after the trees and to motivate communities and colonies together to actively participate in combating pollution at local level.

No afforestation activity can be successful without people's participation. To nurture the trees and to motivate people & communities to actively participate in combating pollution at local level, awareness among citizens and students will be created through print & electronic media, posters, banners & by organizing various debates, quiz competitions and seminars on nature related themes.

PARTNERSHIP INITIATIVE PROGRAMME

Partnership Initiative Programme (PIP) was launched with the motive to generate awareness about the activities to be undertaken by the departments and to seek participation of the public. Under PIP, 102 NGOs have been registered with the Forest Department, Chandigarh for the tree plantation drive. These NGOs co-ordinate with Forest Department for spreading awareness among various stakeholders, carry out plantations & act as extended hands of Forest Department, Chandigarh.

STRATEGIES TO BE ADOPTED BY NGOs AND VOLUNTARY BODIES

NGO's, Environmental Groups, Rotary Clubs, Lions Club, N.S.S., will have following roles to play:

1. To co-ordinate with RWAs and Market Associations for plantation
2. To co-ordinate with the Eco-Clubs in Schools & Colleges for massive plantation
3. To train people, particularly children to plant trees properly
4. To identify such associations and schools which will be participating in the programme and identify a nodal person in each association to work with
5. To assess the number of seedlings and the species required
6. The NGO's will be advised to identify and adopt old/ heritage trees growing in and around Chandigarh. For this, they can take help of financial institutions/ cooperative sectors

STRATEGIES TO BE ADOPTED BY RWAs

Resident Welfare Associations will act as basic co-coordinating unit in the programme. Their work will include:

1. Informing the residents about the tree plantation drive
2. Collecting saplings (free of cost) from Forest Nurseries
3. Gathering volunteers for planting
4. Identifying the places for planting
5. Coordinating with the NGO's and Govt. Agencies and chalking out programme for plantations in their respective colonies
6. Ensuring proper protection and regular watering of plants

NATIONAL GREEN CORPS

जहाँ है हरियाली ।
वहाँ है खुशहाली ।।

Government of India
Ministry of Environment and Forests

Initiated in 2001, National Green Corps, has achieved significant success. Eco-Clubs under the programme of National Green Corps are playing an important role for the protection and conservation of environment. MOEF had initially aimed at establishing 50,000 eco-clubs in this nationwide programme. The phenomenal response that the NGC has received has made the network grow to more than one lakh eco-clubs involving 6 million students across the country in 10 years, making it one of the largest conservation networks. The unique partnership between the MOEF, the State Government agencies along with dedicated NGOs working in the field of environmental education have contributed a lot to the success of this programme.

ROLE OF ECO-CLUBS

Under NGC Scheme, 152 Eco-Clubs in schools and 14 Environmental Societies in various colleges of Chandigarh have been registered in 2019-20. More than 75% of schools and 100% colleges of UT are registered under the NGC scheme. These Eco-Clubs are working under dynamic guidance of Department of Environment, Chandigarh in collaboration with Department of Education, Chandigarh Administration.

For proper dissemination of knowledge and smooth functioning of Eco-Clubs, the department has divided Eco-Clubs into 27 clusters. Each Cluster is a group of >=5 schools & one of the Eco Clubs' in charge is the cluster head. The eco club in charge of schools that are doing extraordinary and outstanding work in the field of environment protection and awareness, are appointed as the head of the respective cluster.

ACTIVITIES OF ECO-CLUBS

1. Tree plantation and to ensure their survival
2. Establishment of herbal gardens
3. Establishment of herbal nurseries
4. Celebration of various environmental days such as World Environment Day, World Earth Day, World Water Day, Ozone Day, Wild Life Week etc
5. Preparation of vermi-compost and compost from dry leaves
6. Environment awareness campaign on various festivals such as preparation of herbal colours on Holi and mass awareness drive during Diwali
7. Exhibition and distribution of herbal plants and seeds during Paudh-Mela
8. Installation of green and blue bins in school Eco-clubs
9. Participation in Van Mahotsav
10. Construction of water ponds

ENVIRONMENTAL DAYS ANNUAL ACTIVITY CALENDAR

2nd Feb.
World Wetland Day

1-14th Feb.
Oil Conservation Fortnight

28th Feb.
National Science Day

14th Mar.
International Day of Action for Rivers

21st Mar.
World Forestry Day

22nd Mar.
World Day For Water

23th Mar.
World Meteorological Day

7th Apr.
World Health Day

18th Apr.
World Heritage Day

22th Apr.
Earth Day

25th Apr.
Arbor Day

29th Apr.
Day of Remembrance For All Victims of Chemical Warfare

30th Apr.
Water Resources Day

22nd May
International Biological Diversity Day

5th Jun.
World Environment Day

17th Jun.
World Day to Combat Desertification

1-7th Jul.
Van Mahotsav Week

11th Jul.
World Population Day

15th Sep.
Engineer's Day

16th Sep.
International Ozone Day

25th Sep.
World Rivers Day

28th Sep.
Green Consumer Day

2nd-8th Oct.
Wildlife Week

5th Oct.
World Habitat Day

16th Oct.
World Food Day

25th Nov.
Conservation Day

2nd Dec.
Pollution Prevention Day

5th Dec.
World Soil Day

11th Dec.
International Mountain Day

13th Dec.
Energy Conservation Day

14th Dec.
National Energy Conservation Day

Oct. - Nov.
Green Diwali Awareness Campaign

STRATEGIES TO BE ADOPTED BY FOREST DEPARTMENT

Forest Department will co-ordinate at various levels. It will distribute the saplings free of cost from its six nurseries to the Educational institutions, NGO's, RWAs and individual residents of the city. The Department will give technical know-how about planting trees and its post planting care, choice of species etc. It will also look after the plantation being created and already created earlier in forest area of Union Territory of Chandigarh. Special van to be deployed for free distribution of saplings at the doorstep of people.

STRATEGIES TO BE ADOPTED BY MUNICIPAL CORPORATION

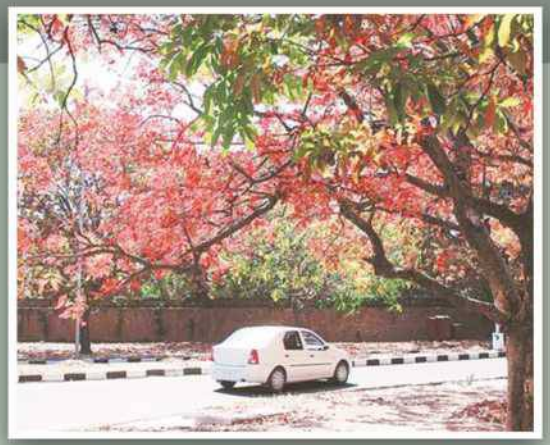
Municipal Corporation is having large numbers of parks and green belts under its jurisdiction. Due to financial and manpower constraints, it is not feasible for Municipal Corporation, Chandigarh to develop all these parks and green belts in one go. Therefore, Municipal Corporation may require the help of RWAs in association with the local Councilor, other departments and Corporate Sector to develop and maintain these parks, green belts and roundabouts and to adopt them on certain kind of Memorandum of Understanding. Municipal Corporation is also selling ornamental, flowering and fruit plants at nominal price. Municipal Corporation will also extend technical know-how to the visiting individual/ organizations. Executive Engineer (Hort.), Municipal Corporation will be the Nodal Officer for co-ordination of plantation drive to be undertaken by RWAs. Municipal Corporation will also allow, wherever feasible, the citizens to put a small name plate near the sapling planted by them. It will give a sense of belonging that will affect post planting care. The local area Councilor, being the public representative, will be the Prime Mover in this campaign.

STRATEGIES TO BE ADOPTED BY HORTICULTURE DIVISION OF ENGINEERING DEPARTMENT

Horticulture Division shall guide all Government Schools and institutions to plant right kind of sapling depending upon the availability of the space and conditions of the site. The Department will be in constant touch with the Institutions. The Department is selling horticultural plants at subsidized rates from its nursery. The department is to plant Avenue Trees along roadside as per the availability of the site & specific tree species.

STRATEGIES TO BE ADOPTED BY CHANDIGARH HOUSING BOARD

The Housing Board shall motivate the residents of its housing colonies to plant & protect maximum number of trees in & around the colonies. The Housing Board needs to plant trees in newly completed Slum Rehabilitation Project.



PROCEDURE FOR GETTING SAPLINGS (FREE OF COST) LOCATION OF FOREST NURSERIES AND PLANTS AVAILABLE

Department of Forests & Wildlife, Chandigarh Administration provides saplings of tree species, shrubs & medicinal plants 'free of cost' for plantation. Department has following six nurseries from where saplings may be collected by the residents, NGOs, schools and other institutions:

CONTACT NUMBER OF THE IN-CHARGES OF THE FOREST DEPARTMENT NURSERIES

Sr. No.	Name of Nursery	Name of Incharge	Contact No.
1.	Hallomajra Nursery on Ambala – Chandigarh National Highway	Sh. Balvinder Singh, Forester	98728-51011
2.	Daria Forest Nursery, opposite Railway Station	Sh. Balvinder Singh, Forester	98728-51011
3.	Kishangarh Nursery at Kishangarh village, opposite Chandigarh Golf Range	Sh. Balvinder Singh, Forester	98728-51011
4.	Forest Nursery in Patiala-ki-Rao Forests (behind Panjab University)	Sh. Kulbir Singh Gill, Forest Guard	99151-27299
5.	Forest Nursery near Lake Club	Sh. Rohit Kumar, Forester	98889-99800
6.	Medicinal Plants Nursery at Chandigarh Botanical Garden, Sarangpur	Sh. Jatinder Singh, Forester	92164-28398

FOREST NURSERIES IN CHANDIGARH

1. Halomajra Nursery on Ambala - Chandigarh National Highway
2. Daria Forest Nursery, opp. Railway Station, Chandigarh
3. Kishangarh Nursery, Vill. Kishangarh, Opposite Chandigarh Golf Range
4. Forest Nursery, near Lake Club
5. Forest Nursery in Patiala-ki-Rao Forests, behind Panjab University.
6. Medicinal Plants' Nursery, Chandigarh Botanical Garden, Sarangpur

CHAPTER 07

MEDICINAL PLANTS OF CHANDIGARH

Department of Forests & Wildlife, UT , Chandigarh

AMLA (T) AFTER 4TH YEAR

Botanical Name	*Emblica officinalis*
Family	Euphorbiaciae
Part Used	Fruit
Medicinal Usages	Cough, Diabetes, Cold, Laxative, Hyperacidity

ANTAMUL

Botanical Name	*Tylophora indica*
Family	Asclepiadaceae
Part Used	Leaf, Root
Medicinal Usages	Bronchitis Cold & Cough

ARJUNA

Botanical Name	*Terminalia arjuna*
Family	Combretaceae
Part Used	Bark, Leaf, Flower
Medicinal Usages	Tonic, Astringent, Febrifuge, Hypertension, Cardiac disease

ASHOK (T) 10 YEAR ONWARDS

Botanical Name	*Saraca osoca*
Family	Caesalpiniaceae
Part Used	Bark Flower
Medicinal Usages	Menstrul Pain, Uterine disorder, Diabetes

ASWAGANDHA (H) 1 YEAR

Botanical Name	*Withania Somnifera*
Family	Solanasaea
Part Used	Root, Leaf
Medicinal Usages	Restorative Tonic, Stress, Nervous Disorder, Aphrodisiac

BAEL (T) AFTER 4-5 YEARS

Botanical Name	*Aegle Marmelos*
Family	Rutacae
Part Used	Fruit, Bark
Medicinal Usages	Diarrhoea, Dysentery Constipation

BAHEDA (T)

Botanical Name	*Terminalia Belerica*
Family	Combretaceae
Part Used	Bark, Fruit
Medicinal Usages	Cough, Insomnia Dropsy, Vomitting, Ulcer

BARNA

Botanical Name	*Crateva adansonil*
Family	Combretaceae
Part Used	Leaf, Root
Medicinal Usages	Anti-periodic Tonic & Demulcent

BHRINGRAJ (H)

Botanical Name	*Eclipta Alba*
Family	Compositae
Part Used	Seed, Whole
Medicinal Usages	Anti-inflammatory Digestive, Hair-tonic

BHUMI AMLA WITH IN 1 YEAR

Botanical Name	*Phyllanthus niruri*
Family	Euphorbiaceae
Part Used	Bark Flower
Medicinal Usages	Anemia, Jaundice Dropsy

BRAHMI (H) 1 YEAR

Botanical Name	*Bacopa monnieri*
Family	Schulariacaea
Part Used	Whole Plant
Medicinal Usages	Nervous, Memory Enhancer, Mental disorder

DHAK

Botanical Name	*Butea Monosperma*
Family	Papilionaceae
Part Used	Flower, Bark
Medicinal Usages	Piles, Tumors & Menstrual disorders

GHRIT KUMARI (H) 2-5 YEAR

Botanical Name	*Aloe vera*
Family	Liliaceae
Part Used	Leaves
Medicinal Usages	Laxative, Wound healing, Skin burns & Ulcer

GULUCHI (C) WITH 1 YEAR

Botanical Name	*Tinospora Cordifolia*
Family	Menispermaceae
Part Used	Stem
Medicinal Usages	Gout, Piles, General debility, Fever, Jaundice

KALMEGH (H) WITH IN 1 YERA

Botanical Name	*Andrographis paniculata*
Family	Scanthaceae
Part Used	Whole Plant
Medicinal Usages	Fever, weakness, Realease of gas

PIPPALI (C) AFTER 2-3 YEARS

Botanical Name	*Piper longum*
Family	FL Piperaceae
Part Used	Fruit, Root
Medicinal Usages	Appetizer, Enlarged Spleen, Bronchitis, Cold, Antidote

MANDUKPARNI (H)

Botanical Name	*Centella asiatica*
Family	Mackinlayaceae
Part Used	Whole Plant
Medicinal Usages	Anti-inflammatory, Jaundice, Diuretic, Diarrhoea

NEEM (T)

Botanical Name	*Azardichata indica*
Family	Meliaceae
Part Used	Rhizome
Medicinal Usages	Sedative, Analgesic, Epilepsy, Hypertension

SADA BAHAR (H)

Botanical Name	*Vinca rosea*
Family	Apocyanae
Part Used	Whole Plant
Medicinal Usages	Leukemia, Antispasmodic, Antidote

SARPA GANDHA (H) After 2 YR

Botanical Name	*Rauvolfia serpentina*
Family	Apocyanacae
Part Used	Root
Medicinal Usages	Hypertension, Insomnia

STAVARI (C) AFTER 2-3 YR

Botanical Name	*Asparagus racemosus*
Family	Liliaceae
Part Used	Tuber, Root
Medicinal Usages	Enhance lactation, General weakness, Fatigue, Cough

STEVIA

Botanical Name	*Ocimum sanctum*
Family	Lamiaceae
Part Used	Leaves, Seeds
Medicinal Usages	Cough, Cold, Bronchitis, Expectorant

TULSI (perennial) / 3 MONTHS

Botanical Name	*Emblica officinalis*
Family	Euphorbiaciae
Part Used	Fruit
Medicinal Usages	Cough, Diabetes, Cold, Laxative, Hyperacidity

CHAPTER 08

TREE TRANSPLANTATION

Many a times, development comes at the cost of our trees, which face the axe on an exponential basis.

One expansive project results in thousands of trees being felled. But what we do not realise is the fact that a fully matured tree once gone is gone forever and any sapling planted in its place would take a very long time even to spread its branches.

While it takes a lot more than desktop activism and campaigning to stop the concerned authorities from axing the trees, what can be done instead is to transplant them.

Transplanting describes re-planting of trees from one location to another. Due to the wide extent and morphology of tree root system, transplanting of trees usually involves substantial removal of roots. Instead of felling trees, direct transplantation technique of big trees is the need of the hour. It involves systematic steps in assessing the feasibility and suitability of transplanting. The major consideration in design, documentation, implementation and post construction stages are required for the proper tree transplanting. The whole transplanting process in particular for large trees is an engineering feat and requires substantial involvement of resources and time.

In fact, the concept is being practised across the world and has been picked up by various civic bodies in the country as well.

Although municipal authorities have been implementing the transplantation through mechanised support and massive machinery, the process can actually be undertaken by a group of individuals as well.

However, one needs to keep in mind that the process requires complete commitment on the planters' behalf, as any kind of lapse could result in failure and loss of a tree.

DETERMINIG FACTORS:

It is important that no tree is unnecessarily sacrificed in development projects. Removal should be considered only if preservation is impractical. Following are the main factors for any transplantation activity-

- General health, form and structure of the tree
- Size of root ball/Type of root system
- Availability and suitability of a receptor site/transit nursery. The location should ideally be selected, keeping in mind the amount of space and sunlight meeting the tree's requirements. Also, knowledge about the species plays a significant role for the tree to adapt in the new site
- Planting area should be sandy, earthy soil, soil with high or low adhesion. Access to existing and receptor locations and transportation

PRE-TRANSPLANT INVESTIGATIONS

- Characteristics of tree
  1. Family and species, varieties
  2. Growth, latex, root system
  3. Shape, size and canopy/branches
- Conservation status/value of tree
- Amenity value, environmental and cultural factors.
- Functional and engineering considerations
- Cost effectiveness
- Site study-road, soil, water availability etc
- Safety precaution

TIME SELECTION FOR TRANSPLANTATION:

- Select the time to switch when the tree is in the process of sleep
- Evergreen trees are suitable for planting at the end of March to the end of April, before the trees come into bloom in the spring rainy season or mid-June to mid-July
- Deciduous trees should be planted at the end of October to mid-December or late March to early April, before the young leaves are released next year
- Bamboo family: Each type of bamboo has different planting time based on the characteristics of each bamboo species

TYPE OF SPECIES	Suitable Period
Conifers	Feb – April & Sept – Oct
Evergreens	Mar – April
Deciduous	Oct – Dec & Mar – April

DISTANCE AND ROUTE OF TRANSPORTATION

The pots are broken during transportation. Viability of the trees will be affected, if the transport time is long. Therefore it is necessary to specify the distance and transport route to minimize transit time and mode.

OPERATION

You can begin by moistening the soil around the tree thoroughly about threeto four days before the move. The purpose is to give soil and plant roots more cohesion, to provide more water to the plant during transport, thereby increasing the survival rate of the plant. It is important to retain as much of the root system in place as possible. Therefore,

- Digging should be done carefully keeping in mind the root system of the tree.
- Ideally, the width of the trench should be double the width of the root ball.
- Cleaning around the root ball.
- Apply coating/chemical on all the cut surface of root
- Wrapping of root ball with jute mesh/net to keep soil intact
- Crown pruning/ branch cutting/canopy management is very important for some tree species as low branching affects the technical operations.
- Coat the cut surface with clay/cement/paint as soon as braches are cut
- For trees with height of more than 3m, to prevent strong winds during the potting process leading to fallen trees, it is necessary to trim the branches to reduce the weight of the tree. At the same time, it is also necessary to fix the tree by means of a system around the tree.
- Trunk should be protected with Thick Jute/ Cloth/Quilts etc
- Please take special care to do all of this gently and try not to displace any of the dirt while tipping the root ball onto the burlap.
- Use a soft object or rope wrapped around the trunk to protect the bark during transport without being crushed and limit the evaporation of plants.

PLANTING AT NEW LOCATION

- For big trees planting should not be done immediately after removal. Normally it needs to be kept for 2 to 3 days.
- Keep in shady areas and water the trunk portion only.
- Dig hole and plug the tree
- Pay heed that the new trench is at least two to three times the size of the root ball, while the depth remains approximately an inch lesser than the root ball's length such that the burlap is visible even after placement of the tree in the trench.
- Lower the tree gently into the hole in the same position that it originally grew in and place the trunk and branches in the upright direction.
- Refill the hole with soil, fertilizer and chemicals
- Compact the soil
- Watering should be done twice a day for at least 30 days. Once a week until 3 months then once in 3 weeks up to 6 months
- Overhead shade may be provided if required.

CHEMICAL TREATMENT

In recent years, a number of stimulants have been developed to increase the viability of plants.

- Treatment of roots: Use sharp knives to cut rotten roots, use root stimulants, prevent insect invasive fungi to preserve roots for plants.
- Planting preservation: For some plants, as they cannot be planted immediately, it is necessary to plant and preserve them to ensure the survival rate for the plants

PRECAUTIONS

- Plant trees on land with lots of gravel and sand.
- Planting trees on barren land adds additional borrowed soil and manure.
- If there is a lot of gravel, then the size of the hole should be twice as large as the normal planting hole.
- If the soil is weak, then dig to hard soil and then add soil borrowed into planting holes so that when planting, the trees will not be leaning.
- Planting soil is only in the process of planting, then use the soil in the place or borrowed land to put in the planting hole. Before putting soil into planting holes, attention should be paid to cleaning weeds, packaging, plastic bags.
- After filling the soil in planting holes, start watering till the soil is submerged. Replenish the soil until it is full, then stop and water the base. Wait for the water to withdraw and compress. Pay attention not to allow the roots to protrude from the ground.

WATER RETAINING DITCHES

- After completing the soil filling, the hole will be created for the planting hole. Calculated from trunk to groove diameter of 5-6 times the diameter of the trunk, creating circular grooves 10-20 cm high.
- Dig trench around tree planting holes to retain water for plants.

SUPPORT & MAINTENANCE

- Support with tripod structure clamps made of metal/wood.
- Wrap the rope (braided with straw fiber) around the tree to 60% of the body height. For branches, wrap 50% branch length.
- Shielding plants: Different types of nets can be used to limit harsh sunshine to the trees on the initial days of transfer.

CHAPTER 09

PLANT PATHOGENS - MEALY BUG TREATMENT

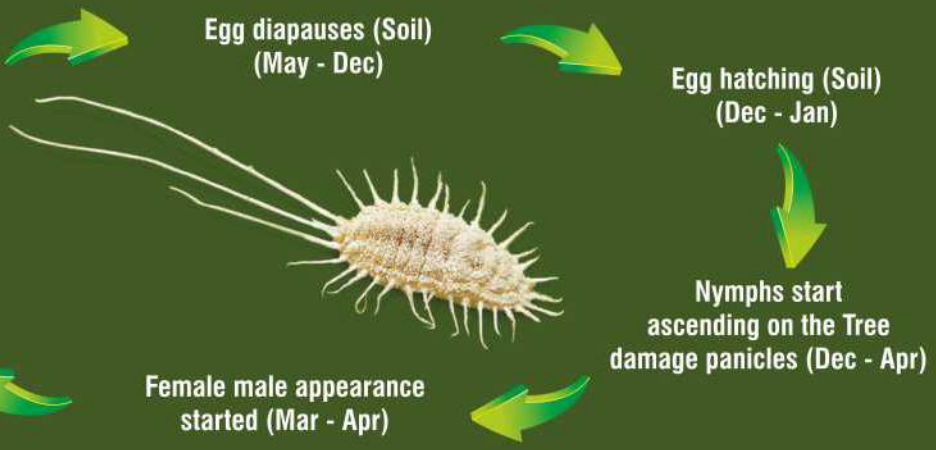
When the dry and foggy winters leave, the seasons are replaced by bright warmer sunny days. Many creatures start coming back, most commonly and easily felt and seen are the mosquitoes, houseflies and geckos. But what we mostly tend to oversee is the one who slowly and persistently damages the plants around. It's called Mango Mealy Bug (Drosicha mangiferae).

It's crucial that we understand this parasitic insect to fight against and save the environment with more efficiency and diligence. In the month of February to April the attack of mealy bug gets a tedious task to control or overcome. However, since knowledge is the key to success, the first step is to understand the life cycle of this insect which comes under the category of scales, meaning 'sucking' type of insect. Over the year, it changes its habitat & is now prevalent in large number of plant species.

APPEARANCE:

Adult male is crimson coloured with brownish black forewings. Female bugs are mealy white in colour, elliptical in shape and covered with numerous minute hair.

MANGO MEALY BUG - LIFE CYCLE



		Female	Male
Nymphs	1st instars	45 - 71 days	45 - 71 days
	2nd instar	18 - 38 days	18 - 38 days
	3rd instar *	15 - 26 days	9 - 15 days
Pupa		Nil	9 - 15 days
Total life cycle		78 - 135 days	77 - 134 days

* Differentiation of Male & Female starts

Life Cycle

Female mealy bug moves from the top of plant in the month of March-April onwards as the temperature at the top level goes up & comes down to the soil for safer environment. It rests over there & stays in a diapause state till the month of November-December. Egg-hatching starts & new nymphs crawl up again and reaches to the top of the same plant to the feed themselves till February, where they congregate together and suck juice from young shoots, panicles and flower pedicels or anything which is juicy & damage the plant parts & make itself ready for mating. Eggs are formed in silken clothes in (500-600 numbers) & then as the temperature goes up, it moves down again to the base of plant & stays there for period of 7 months & this process is repeated year after year whereas the male dies after 35 days of the formation.

To control these insects, the measures have to be beyond sprays and chemicals for integrated pest management, for a holistic approach.

Nature of Damage:

- The nymphs ascend the trees and settle on inflorescence causing flower drop and affecting the fruit set.
- Nymphs and adults suck the plant sap.
- They secrete honey dew which attracts fungus due to which black sooty mold may be seen on twigs and shoots.

Eco Friendly Approach

1. First egg hatching needs to be checked by engaging the soil to higher temperature in month of April- May.
2. Irrigating smartly is the second option, as it is observed that when monsoon is heavy or there are heavy winter-rains or stagnated water, population of Mealy Bug decreases as it hinders the process of hatching.
3. Prune out light infestations.
4. Do not over-water, irrigate or avoid injudicious fertiliser application as mealy bugs are attracted to plants with high nitrogen levels and soft growth.
5. Mango mealy bug can be managed by banding of tree trunks with polythene sheet (400-gauge ,30 cm wide) at a height of about 30 cm from the ground level and grease should be applied at the lower edge of band starting mid-December. This will prevent pink to brown coloured nymphs crawling up the tree.

By following these steps, we can reduce our dependency from chemicals that are harmful in nature. The most environment-friendly way for effective system of controlling this gregarious pests can be derived only after understanding the principles responsible for the population fluctuation in the ecosystem.

CHAPTER 10 USEFUL TIPS

TIPS FOR PLANTATION BY SEED

Growing plants from seeds is definitely cheaper than buying transplants. It will also be easier to find seeds of varieties not typically available for sale as transplants. Whatever the reason, starting plants from seeds is probably not a hard as you think. And growing plants all the way from seed to maturity is one of gardening's most rewarding endeavours.

Here are the basics:

- Wet the soil with lukewarm water before sowing the seed shortly before its germination so that it is not exposed to the risk of being eaten away by birds and rodents.
- You'll find the proper planting depth on the seed packet. The general rule of thumb is to cover seeds with soil equal to three times their thickness – but be sure to read the seed packet planting instructions carefully. Some seeds need light to germinate and should rest on the soil surface but still be in good contact with moist soil. Gentle tamping after sowing will help. After planting your seeds, use a spray bottle to wet the soil again.
- Always use room-temperature water. Let chlorinated water sit overnight so chlorine can dissipate. It's important to keep soil consistently moist, but avoid overwatering, which promotes diseases, that can kill seedlings. Try not to splash water on leaves.
- Seeds need warm soil to germinate. They germinate slower, or not at all, in soils that are too cool. Most seeds will germinate at around 78°F. Seedlings can withstand air temperature as low as 50°F as long as soil temperature remains 65-70°F.
- Start feeding your seedlings after they develop their second set of true leaves, applying a half-strength liquid fertilizer weekly. Apply it gently so seedlings are not dislodged from the soil. After four weeks, apply full-strength liquid fertilizer every other week.
- Not enough light leads to leggy, tall seedlings that will struggle once transplanted. Ideally, seedlings need 14-16 hours of direct light per day for healthiest growth. If seedlings begin bending, that's a sure sign they are not getting enough light.

COMMON SEED-STARTING MISTAKES

Seeds are like magic to gardeners and one of the miracles of nature. Plant them in soil, keep them moist and you're on the way to a beautiful bloom. Or, you can start seeds indoors to jump-start your garden with new or unusual varieties. Whether you have started plants from seeds before or have never had the pleasure, you'll improve your success by avoiding these common mistakes.

- **Mistake #1**: Try to avoid the first mistake most seed starters make: ordering way too many seeds. Be practical and exercise self-restraint. If you're a first-timer, don't start with too many different types of seeds. Stick with the ones that are easy to germinate and grow.
- **Mistake #2**: Check seed packets carefully, for specific information about how deep to plant seeds. A general rule of thumb is to plant seeds at a depth equal to two or three times their width, but it's better to plant seeds too shallow than too deep. Seeds of some plants need light to trigger germination and shouldn't be covered at all. Such seeds, however, should be lightly tamped after sowing so they have good contact with the soil.
- **Mistake #3**: Make labels before you sow any seeds. Place the labels at the appropriate place, making sure there will be no confusion. Otherwise, it will be tough to tell the different seedlings apart and what they are supposed to mature into. You should also include sowing dates on your labels so you know when to expect germination.
- **Mistake #4**: Seed packets specify the soil temperature seeds require for the highest percentage of germination. Remember, that's soil temperature, not air temperature. Most seed germinate at around 78°F but it can vary. After germination, aim to keep soil temperature in the 65-70°F range.
- **Mistake #5**: Keep the soil damp but not too wet until seeds germinate. Once seeds sprout, don't miss a watering or your seedlings will almost surely die. Unlike established plants, seedlings don't have an extensive root system to rely on for water. At the same time, it's important not to overwater and let seedlings sit in soggy soil, which encourages disease.
- **Mistake #6**: Newly germinated seedlings are delicate creatures. They need to be checked daily and given lots of tender loving care, especially early on. If you can't monitor seedlings daily, checking on germination, soil moisture, temperature, and light, you'll reduce your chances of success significantly. It's a hard lesson to learn that seedlings don't survive neglect.

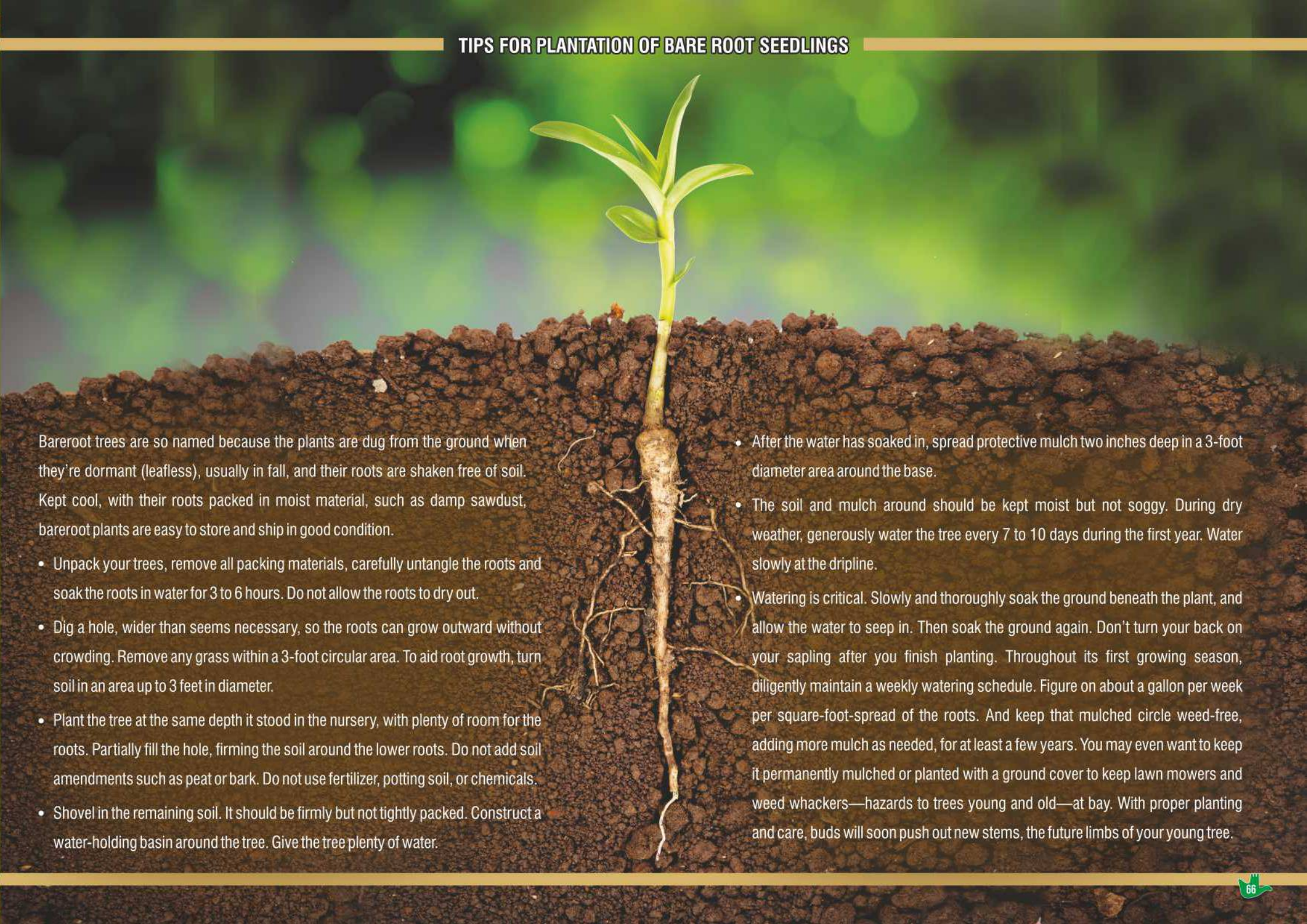
TIPS FOR PLANTING SAPLINGS

There are not many things that are more rewarding than planting a sapling. It is an investment in the hope of the future. Trees are incredibly beneficial to our environment. They beautify the landscape, provide shade, produce oxygen, give fruits, nuts and invite essential bees, birds and butterflies to your home. Tree continually purify the air around us. They absorb harmful pollutants from the atmosphere through their pore-like stomata and filter these chemicals out of the air. They prevent soil erosion, store water, assist with adding beneficial nutrients to the soil, and help to counteract the effects of global warming.

Here are some of the ways to plant saplings to give them their very best start on their journey to maturation.

- Saplings are simply young trees that have grown to a diameter of between 1 to 5 inches and have reached a height of at least 4½ feet. Tree saplings can be packaged in the form of root balls, burlap-wrapped, bare-root plants, or in containers.
- The optimal time for planting a tree sapling is in spring time. If the sapling is nursery-grown in a container, then it can be planted a bit later, provided that it has been watered regularly.
- Choose an open sunny spot to plant the sapling. Be sure to think ahead and consider how much space the tree will need when it matures fully. Find a location that will not interfere with the root system of a fully developed tree. It will be better to select an area that is app 15 ft away from your home or other obstructions like sidewalks, driveways, power-lines and other trees.
- It is vital to keep the roots of the sapling moist at all times.If roots get dry, the sapling will suffer.
- Measure the diameter of the root ball before digging a hole that is two or three times the width of the root ball and an inch or two less deep.
- Trim off any dry or damaged roots.
- It is crucial to plant the sapling at the proper depth. Naturally occurring trees have roots that begin at or below ground level.
- Remove any netting, tree tags, or zip ties that can disfigure trunks and branches as the sapling grows, pull any burlap away from the stem and the root ball.
- Add well-decomposed compost, filling in the hole and then press down firmly with your boot. Continue to add soil until all air pockets are removed, and the soil is in level with the ground.
- Mulch generously with organic mulch.
- Water the young sapling well.

TIPS FOR PLANTATION OF BARE ROOT SEEDLINGS



Bareroot trees are so named because the plants are dug from the ground when they're dormant (leafless), usually in fall, and their roots are shaken free of soil. Kept cool, with their roots packed in moist material, such as damp sawdust, bareroot plants are easy to store and ship in good condition.

- Unpack your trees, remove all packing materials, carefully untangle the roots and soak the roots in water for 3 to 6 hours. Do not allow the roots to dry out.
- Dig a hole, wider than seems necessary, so the roots can grow outward without crowding. Remove any grass within a 3-foot circular area. To aid root growth, turn soil in an area up to 3 feet in diameter.
- Plant the tree at the same depth it stood in the nursery, with plenty of room for the roots. Partially fill the hole, firming the soil around the lower roots. Do not add soil amendments such as peat or bark. Do not use fertilizer, potting soil, or chemicals.
- Shovel in the remaining soil. It should be firmly but not tightly packed. Construct a water-holding basin around the tree. Give the tree plenty of water.
- After the water has soaked in, spread protective mulch two inches deep in a 3-foot diameter area around the base.
- The soil and mulch around should be kept moist but not soggy. During dry weather, generously water the tree every 7 to 10 days during the first year. Water slowly at the dripline.
- Watering is critical. Slowly and thoroughly soak the ground beneath the plant, and allow the water to seep in. Then soak the ground again. Don't turn your back on your sapling after you finish planting. Throughout its first growing season, diligently maintain a weekly watering schedule. Figure on about a gallon per week per square-foot-spread of the roots. And keep that mulched circle weed-free, adding more mulch as needed, for at least a few years. You may even want to keep it permanently mulched or planted with a ground cover to keep lawn mowers and weed whackers—hazards to trees young and old—at bay. With proper planting and care, buds will soon push out new stems, the future limbs of your young tree.

TIPS FOR PLANTATION OF POTTED OR BURLAP WRAPPED SEEDLINGS

Generally, a sapling can be planted in 15 to 30 minutes while container-grown or burlap trees take an hour to plant.

So while planting a potted or Burlap Wrapped seedling, pay extra-close attention when positioning the tree depth around the root flare. Planting the root flare too deep is the biggest tree planting mistake! Sometimes, you may have to partially remove the soil from the top of the container or root ball to even find the flare.

BURLAP WRAPPED:

- To move your tree, roll it or hold it by the root ball– never the trunk or branches.
- Dig a saucer-shaped hole as deep as the root ball and at least twice as wide.
- Position your tree, so the area where the roots meet the trunk is at or slightly above the ground. That's called the root flare. The biggest mistake we see is people planting new trees too deep. Also, make sure the ground beneath the root ball is solid so that the tree doesn't settle lower because of its own weight.
- Cut the twine and remove the burlap around the base of the trunk and the top of the root ball. It's hard to tell the difference between synthetic and organic, and sometimes even organic burlap doesn't decompose properly.
- Hold the tree upright and refill the hole with the soil you just removed. If the soil is lumpy, break it up a little before placing back in the hole. Then, pack it down to get rid of any air pockets. Add water as you backfill.
- Add 2 to 3 inches of organic mulch to the edge of the tree's canopy. Then, water again.
- If your tree has a small root ball and seems to be top-heavy, stake it to provide enough support. Remove it after a year.

POTTED:

- An hour before you plant, water the tree to reduce transplant shock and make it easier to remove from the container.
- When moving the tree, grab and hold by the container–never the trunk or branches.
- Dig a saucer-shaped hole as deep as the container and 2 to 3 times as wide.
- To remove the tree from its planter, place it on its side. Because you just watered it, the tree should easily slide out when you tap the bottom of the container. If needed, tilt. Just be sure to support the trunk!
- Cut off any roots that are squishy or dead. If the roots look tangled, make several vertical cuts in the sides of the root ball and an X-shape cut in the bottom to loosen the roots. Straighten any roots that are circling the margins of the container as best you can. If the roots are much larger than when you first measured, see if you need to make the planting hole bigger.
- Position your tree, so the area where the roots meet the trunk is at or slightly above the ground. That's called the root flare.
- Hold the tree upright, and refill the hole with the soil you just removed. Pack the soil to get rid of any air pockets.

HEALTH BENEFITS OF PLANTS

Adding plants to your home or work environment reduces your perceived stress levels and makes you feel more relaxed, secure, and happy. Plants can help achieve a more optimistic outlook on your life, bringing you both pleasing visual stimulation and helping you to increase your perceived happiness. Being around plants can help to improve relationships between people and increase their concern and empathy toward others.

Concentration and Memory. Being around plants helps people concentrate better in the home and workplace. Studies show that tasks performed while under the calming influence of nature are performed better and with greater accuracy, yielding a higher quality result. Moreover, being outside in a natural environment can improve memory performance and attention span by twenty percent.

Keeping ornamental plants in the home and in the workplace increases memory retention and concentration. The calming influence of natural environments is conducive to positive work environments by increasing a person's ability to concentrate on the task at hand. Work performed under the natural influence of ornamental plants is normally of higher quality and completed with a much higher accuracy rate than work done in environments devoid of nature.

Educational Benefits. Parks and botanical gardens often play host to educational programs and special events, which contribute to the cultural awareness and education of the community especially children. This raises environmental consciousness and appreciation. Plants foster an appreciation for nature that often instills in residents a sense of responsibility for the caring of and protection of the environment. Plants also impact adults in the community as well, creating a cultural awareness of the importance of natural environments.

Happiness. Having flowers around the home and office greatly improves mood and reduces the likelihood of stress-related depression. Flowers and ornamental plants increase levels of positive energy and help people feel secure and relaxed.

Keeping flowers around the home and in the workplace greatly reduces a person's stress levels. Natural aesthetic beauty is soothing to people, and keeping ornamental flowers around the home environment is an excellent way to lower levels of stress and anxiety. People who keep flowers in their home feel happier, less stressed, and more relaxed.

Health and Recreation. Access to parks and recreational activities is positively correlated with physical activity, which improves mood and contributes to overall healthiness. Health care costs are subsequently reduced.Parks and urban green spaces impact people's health by providing them with free and convenient recreational service. There is a positive correlation between the presence of a park in a neighborhood and the level of physical activity of the residents, when there is a no-cost, aesthetically pleasing area or facility for them to use.

Accelerates Healing Process. The presence of plants in hospital recovery rooms and views of aesthetically-pleasing gardens help patients to heal faster, due to the soothing affects. Shrubs, trees, and flowers have a practical application in hospitals. The soothing effects of ornamental flowers and plants are so great that simply having daily views of flowers and other ornamental plants in landscaped areas outside patient recovery room significantly speed up recovery time.

Improves Compassion. People who spend extended lengths of time around plants tend to have better relationships with others. This is due to measurable increases in feelings of compassion; another effect of exposure to plants. Plants impact the levels of compassion that people feel for others. People who spend more time around plants are much more likely to help others, and often have more advanced social relationships. People who care for nature are more likely to care for others, reaching out to their peers and forming shared bonds resulting from their common interests.

Improved Energy. Spending time in natural environments makes people better at doing their jobs. Spending time in nature gives people increased energy levels. Natural environments induce a positive outlook on life, making people feel more alive and active. Plants can help people to improve their performance at work and at home by increasing their energy. The effect of nature in the home and in the workplace serves to stimulate both the senses as well as the mind, improving mental cognition and performance.

Learning. Children who spend time around plants learn better. Being around natural environments improves the ability of children with Attention Deficit Disorder to focus, concentrate, and engage more with their surrounding environment. Keeping plants in a children's learning environment enhances learning capabilities by helping them to focus and concentrate. This improves their ability to learn new things and makes it easier for them to absorb and retain information. Plants are conducive to generating a positive learning environment, reducing children's tendency towards distraction and helping them to be better able concentrate on school work.

Medicinal Properties. One of the more obvious benefits of plants and trees is that many of them have valuable medicinal properties. Cultivating plants helps humanity because it provides opportunities for additional scientific studies of the possible positive medicinal values of plants. Natural herbal remedies are simple and holistic methods for treating common illnesses and maladies.

Mental Health. Studies have proven that people who spend more time outside in nature have a significantly more positive outlook on life than people who spend a great deal of time indoors. Communing with the natural world increases people's energy, and consequently has a large positive effect on their overall mental health.

Perceived Quality of Life. People associate beautifully landscaped areas with a higher quality of life. This is important in attracting businesses and sustaining growth in the community. Beautiful natural landscapes not only improve the aesthetics of the community, they also improve resident's perceived quality of life. People associate living in areas with a great deal of natural beauty with a higher quality of life. A high quality of life, in turn, benefits the entire community, because people become more thoughtful in perceiving things and tend to make wise decisions for better life.

Reduces Crime. Neighborhoods with beautiful parks tend to have less crime. This is because parks give people a reason to come together and become a tight-knit community. People who care about their neighborhood parks are much more likely to get politically involved when businesses threaten to downsize them. Increasing political activism in the community is another positive outcome of cultivating a love for neighborhood parks. Neighborhoods with beautiful parks and landscaping have reduced crime rates. This is due to the increase in community cohesion that occurs as neighborhood rallies around a beautiful local landmark. When residents feel greater pride in the beauty of where they live, they are much less likely to detract from it.

Reduces Stress. People who spend time cultivating plants have less stress in their lives. Plants soothe human beings and provide a positive way for people to channel their stress into nurturing. Participation in gardening and landscaping activities is an effective way to reduce levels of stress. People who nurture plants have less mental distress than others. Plants provide people with a positive way to channelise their stress and frustration into something beautiful that provides them with comfort and joy.

Therapeutic Effects. Plants can act as therapy for people who have undergone trauma. The act of nurturing something is a way for people to work through the issues surrounding traumatic events and improve their mental health. Plants can have therapeutic effects on people who have undergone trauma, either mental or physical. The act of nurturing a plant can provide victims with a way to work through their issues and heal their wounds, whether they are on the surface of the skin or deeper.

Traffic Safety. Beautifying road ways can have the dual effect of increasing satisfaction with the roadside landscape and creating a natural median. Drivers are much less likely to accidentally drive over a median if there is a landscaped area between oncoming lanes of traffic.

Beautifying traffic medians not only improves the aesthetics of the roadways, it also affects attitudes. People are more at ease on roadways with natural landscaping, and are much more inclined to think positively about the community that they are driving through if the roadways are beautiful.

Upgrade Effect. As parts of the community begin to improve their urban green spaces, other areas will be forced to stay competitive and beautify their areas as well. The upgrade effect benefits the entire community, as neighborhoods and businesses encourage each other to landscape and beautify the community. As more businesses and neighborhoods take on the task of beautifying their surroundings, other competing areas will be forced to follow suit. In other words, as a community works to better itself, other parts of the area will be forced to upgrade as well to keep drawing people in; this phenomenon is known as the upgrade effect.

DEPARTMENT OF FORESTS & WILDLIFE, CHANDIGARH ADMINISTRATION

2nd floor, Paryavaran Bhawan, Sector 19-B, Madhya Marg, Chandigarh - 160 019

Ph.: 0172-2700284; e-mail: forestchandigarh@gmail.com;

Website: chandigarhforest.gov.in | Wildlife Hotline: 0172-2700217