GOVERNMENT OF NATIONAL CAPITAL TERRITORY OF DELHI
DIRECTORATE OF EDUCATION: SCIENCE & TV BRANCH
OLD GARGI COLLEGE BUILDING: LAJPAT NAGAR-IV; NEW DELHI-110024
Ph. No.: 26280408-12; Email: pecdoe2@gmail.com

F.No.DE.40(6)/90/SCB/2024/ 506-511 **Date: 26/04/2024**

CIRCULAR

Sub: Tree Plantation / Greening Drive in Delhi Schools- Regarding.

All the Govt./ Govt Aided/Private Unaided recognized schools of DOE, Govt. of NCT of Delhi have done a commendable job in the area of Tree Plantation/Greening activities during the years 2023-24 . A target of "Three Lakh Twenty Four Thousand Five Hundred Saplings" (118000 Trees and 206500 Shrubs) to be planted in all schools of DoE, GNCT of Delhi through Eco-Club members are fixed by the Department of Environment, GNCT of Delhi for the academic year 2024-25.

In this regard, the following actions are to be especially taken by the HOSs in the schools of DoE, GNCT of Delhi.

1. Awareness Campaigning about Tree Plantation.
2. Essay and Slogan writing competition on Greening school.
3. Poster, Painting, Role Play and Nukkad Natak competition on Environment.
4. Special Tree Plantation Drive to be conducted on 16th Aug, 2024 for maximum plantation in the school.
5. Plantation of Trees and Shrubs every month.
6. Increasing Green Patch area using grass and creepers to decrease the air pollution.
7. 80% Target will be achieved upto 16th August 2024 by all schools for plantation in all the open areas and available space.
8. For more Plantation Saplings can be obtained free of cost by the school from any of nurseries being run by the Forest Department, GNCT of Delhi (List enclosed).
9. The HoS and Teacher In-charge of the Eco-Club as well as all staff members shall plant saplings and regularly monitor the condition of the plants as well as maintain them with the help of students' participation.
10. Minimum 300 saplings (120 Trees and 180 Shrubs) are to be planted in the current session by every school.
11. The action plan for the session 2024-25 is enclosed as annexure-I & II for implementation as per the given schedule.

Thus, all the HoSs of Govt./Govt. Aided/Private-Unaided recognized schools of GNCT of Delhi are requested to submit monthly Plantation/ Greening Report in format I (every month) and Survival of plantation for the session 2024-25 in format II to their respective Zonal Convener (list attached). The Zonal Conveners will send the compile report of each format to their respective Science Centres and the Science Centres will submit the compile report to the Science Branch, Old Gargi College Building, Lajpat Nagar-IV, New Delhi-110024, as per time schedule given in the enclosed Annexure- III . Submit the report on environmental activities by all the HoSs through following google link on the last day of the schedule month.

The google link https://shorturl.at/otGQ3

This issues with the prior approval of the competent authority.

Encls: As above

(ZAREEN TAJ)
Addl. DE (Science Branch)

F.No.DE.40(6)/90/SCB/2024/ 506-511 **Date: 26/04/2024**

Copy to:-

1. PS to Secretary Education, Directorate of Education, GNCT of Delhi.
2. PS to Director of Education, Directorate of Education, GNCT of Delhi.
3. All DDEs (District/Zone) to monitor & ensure the compliance please.
4. The Incharges of Science Centres (I,II,III & IV)
5. All the HOSs of Govt./Govt Aided / Private Unaided Recognized Schools of Directorate of Education, GNCT of Delhi.
6. Incharge, Computer Cell with the request to upload the Circular on the Departmental website as well as in public Circular.

26/04/2024

(DR. SUDHAKAR GAIKWAD)
Dy. Director of Education (Science Branch)

Annexure-I

Action plan for Plantation/Greening for the session 2024-25

S. NO.	THEME	ACTION PLAN	SCHEDULE
1	Tree plantation in all schools of DoE	Site selection & Soil weathering for plantation. Overall target for DoE Schools - Three Lakh Twenty Four Thousand Five Hundred plantation is set for session 2024-25. Trees =1,18,000, Shrubs=2,06,500 i. Green barricading around the walls ii. Plantation of Ashoka Trees and Air purify plants (Rubber, Snake plants) - A minimum 300 saplings (120 Trees and 180 Shrubs) are to be planted in the current session by every school (Govt./ Govt.Aided / Govt.Unaided Private Schools) Survival rate of plantation 2023-24 Special Tree Plantation Cleaning (Weed removal) & Mortality refreshment	April 2024 to May 2024 April 2024 to March 2025 April 2024 August 2024 September to October 2024
2	Awareness Campaigning.	Survey for more plantation and the awareness campaign/ drive to be organized in the schools for making school campus green	July 2024
3	Seminar/ Webinar for Zonal conveners in r/o plantation Drive.	Seminar/ Webinar would be organized for Zonal conveners for effective implementations of greening activities in the schools and further Zonal conveners will organize seminar/ webinar for HOS/ Eco Club in-charge for their respective zones.	August 2024
4	Awareness campaigning in the school to protect environment through eco club in-charge and students.	To make greening area of school , the following activities is to be organized in the school on the theme – Green School Environment (Display the best slogan & Painting in school premises) i) Essay Writing ii) Slogan Writing iii) Painting iv) Role Play v) Nukkad Natak	September 2024
5	Plantation and greening drive for dense plantation in the school.	We may organizing selection drive under DoE to select the best Green School from each District. Certificate will be awarded after drive to the selected schools.	November 2024
6	Publication of reports in science magazine "Nai Udaan".	Photographs of best schools with green area/ landscape/ plantation will be published for motivation purpose in the magazine "Nai Udaan"	December 2024

Annexure-II

ACTION PLAN FOR AWARENESS ACTIVITIES ON ENVIRONMENTAL POLLUTION 2024-25

S. NO.	THEME	ACTION PLAN	SCHEDULE
1	**Abating air pollution through Greening and Plantation programs**	I.Awareness campaigning about tree plantation II. Essay and Slogan Writing competition on greening schools III.. Poster, Panting and Nukkad Natak competition on Environment IV. Special tree plantation drive to be conducted on 16th Aug, 2024 for maximum plantation in the school. V. Plantation of Trees and Shrubs every month. VI. Increasing Green Patch are using grass and creepers to decrease the air pollution caused by dust VII. 80% target will be achieved upto 16th Aug, 2024 by all schools for plantation in all the open areas and available space VIII. A minimum 300 saplings (120 Trees and 180 Shrubs) are to be planted in the current session by every school. Target of Three Lakh Twenty Four Thousand Five Hundred plantation is set for session 2024-25.Trees =1,18,000, Shrubs=2,06,500	July 2024 & August 2024
2	**Public Awareness and citizen participation on air pollution mitigation at individual and community level**	Awareness through Lecture, Poster Competition, Quiz, Painting, Role Play & Essay Writing on the following points:- I. Reduction of forest fires and smoking II. Ban on single use plastic / No to plastic bag III. Recycle and Reuse IV. Using public transport V. Avoid usage of crackers VI. Use filters for chimneys VII. Turn off the lights when not in use VIII. Avoid using of products with chemicals IX. Need to more Greening / Plantations. The practice of planting trees provide a lot of benefits to the environment and health with the release of oxygen.	September 2024 & October 2024

Annexure-III

Schedule for Submission of Reports (Format-I and Format-II)

Sr No.	Format	Report	From	To	Submission upto
1	Format-I (Every Month)	Monthly Plantation/Greening Report	HoS	Respective Zonal Convener	1st Day of Every Month
		Compiled Report by Zonal Conveners	Zonal Conveners	Respective Science Centre	2nd Day of Every Month
		Compiled Report by Science Centres	Science Centres	Science Branch (HQ)	3rd Day of Every Month
2	Format-II (One Time)	**Survival Report of Plantation for the Session 2023-24**	HoS	Respective Zonal Convener	15th May,24
		Compiled Report by Zonal Conveners	Zonal Conveners	Respective Science Centre	16th May,24
		Compiled Report by Science Centres	Science Centres	Science Branch HQ	17th May,24

(For School)

Format-I

Name of Month & Year.....

Monthly Plantation/Greening Report

1	Name of School and ID	
2	Zone and District	
3	Type of School (Govt/Govt Aided/Unaided)	
4	Name of HoS	
5	Mail ID of School	
6	Available Area for plantation in the School (In Sq. meter)	
7	Area Sub-Divided Direction Wise (In Sq. meter)	
a	East	
b	West	
c	North	
d	South	

Sr. No.	Month	Activities	No. of Saplings Planted w.e.f. _____ to _____		
			Trees	Shrubs	Total
1	April 2024	Plantation through Eco-Club			
2	May 2024	Plantation through Eco-Club			
3	June 2024	Plantation through Eco-Club			
4	July 2024	Plantation through Eco-Club			
5	August 2024	Plantation through Eco-Club			
6	September 2024	Plantation through Eco-Club			
7	October 2024	Plantation through Eco-Club			
8	November 2024	Plantation through Eco-Club			
9	December 2024	Plantation through Eco-Club			
10	January 2025	Plantation through Eco-Club			
11	February 2025	Plantation through Eco-Club			
12	March 2025	Plantation through Eco-Club			

Sign and Name of HoS with Stamp
Mobile Number:

Note: HOSs are advised to provide actual number of saplings planted in the school at every month in the monthly Plantation/Greening report (Format-I)

(For School)

Format-II

Survival Report of Plantation for the Session 2023-24

Table-1

1	Name of School and ID	
2	Zone and District	
3	Type of School (Govt/Govt Aided/Unaided)	
4	Name of HoS	
5	Mail Id of School	
6	Total Plantation Area Available in the School (In Sq. Meter)	
7	Area sub-Divided Direction Wise (In Sq. Meter)	
a	East	
b	west	
c	North	
d	South	
8	*Details of plants in the school premises *only for school building incharge	Total Plants = Tree = Shrubs =

Sr. No.	Activities	Total Number of Sapling planted in the School from 01.04.2023 to 31.03.2024			Existing (Survived)Plants as on 31.03.2024		
		Trees	Shrubs	Total	Trees	Shrubs	Total
1	Plantation through Eco-Club						

Table -2

Sr No.	Activities	Green Patch Area as on 31.03.2023 (in Sq. Meter)	Green Patch Area as on 31.03.2024 (In Sq. Meter)	Available Area for Green Patch for the Session 2024-25 (in Sq. meter)
1	Greening by Grass and Creepers			

Sign and Name of HoS with Stamp

Mobile Number

List for Zonal Conveners for Greening/Plantation for the year 2024-25

Science Centres	District	Zone	Name of Zonal Convener	Designation	Name of School	School ID	Mobile No. of Zonal Convener	E-Mail Id
Centre-4 Surajmal Vihar	East	1	Ms. Yogmaya	Principal	SKV, Surajmal Vihar, Delhi	1001102	9315070031	1001102hos@gmail.com
		2	Ms. Suman Kumar	Vice Principal	GGSSS, School Block, Shakarpur, Delhi	1002191	9971347172	1002191hos@gmail.com
		3	Ms. Lekha Sharma	Vice Principal	GGSSS, Lalita Park, Delhi	1003260	9868170822	1003260hos@gmail.com
	North East-I	4	Sh. Anil Kumar Tiwari	Principal	GBSSS No.2 Ghonda, Delhi	1104007	9462788504	ghondano.2@gmail.com
	North East-II	5	Sh. D.K. Shalonia	Principal	GBSS Welcome Colony, Delhi	1105015	9810593297	gbss2004@gmail.com
		6	Sh. Pramod Kumar	Principal	BP SBV, B-Block, Nand Nagri, Delhi	1106001	9990316275	1106001hos@gmail.com
Centre-1- SU Block, Pitampura	North	7	Sh. Shashi Prakash	Vice Principal	GBSSS Mukund Pur Village, Delhi	1207236	9899396085	gbsssmukundpur@gmail.com
		8	Sh. Jai Prakash	Principal	S (Co-Ed) V Gulabi Bagh, Delhi	1208013	8076208385	gskvgulabibagh@gmail.com
	North West - A	9	Dr. Aishwarya Ratnam Pandeya	Vice Principal	Shalimar Bagh, Block Bl-SKV, Delhi	1309030	9354250639	1309030hos@gmail.com
		10	Sh. Pradeep Kumar	Vice Principal	Holambi Khurdg (Co-Ed) SSS	1310472	9811740191	pardeep41170@gmail.com
	North West - B	11	Sh. Anil Kumar	Principal	S.V. C-Block, Saraswati Vihar, Delhi	1411123	9968292553	hos1411123@gmail.com
		12	Sh. Anil Kumar	Vice Principal	GBSSS, Bc-Block Sultanpuri, Delhi	1412006	9811574783	hos1412006@gmail.com
		13	Sh.Arvind Kumar	Principal	SV,Sec-3 Rohini, New Delhi	1413002	9205872160	1413002zone13@gmail.com
Centre-3 Link Road, Karol Bagh	West-A	14	Sh. Shantanu Dutta	Principal	SBV, No.2 Tilak Nagar, New Delhi	1514006	9810755054	sbvprincipal@gmail.com
		15	Sh. Manoj Kumar	Principal	SBV, Subhash Nagar, New Delhi	1515003	9718664805	1515003z15@gmail.com

		16	Sh. Narendra Singh	Principal	SBV, Shadi Khampur, Delhi	1516011	9818822624	gbsss1516011@gmail.com
	West-B	17	Dr. Rakesh Kumar	Principal	Govt. Sarvodaya Vidyalaya B-4, Paschim Vihar, New Delhi	1617008	8447364875	gscevb4pv@gmail.com
		18	Dr. Niranjan Kumar	Principal	SBV, No-2 C Block Janakpuri New Delhi	1618005	9717350748	1618005janakpuri@gmail.com
Centre-2 C-4, Vasant Vihar, New Delhi	South West-A	19	Ms. Runu Chaudhary	Principal	Govt. Co-Ed SSS Sec-5 R.K.Puram, New Delhi	1719104	9910476756	1719104rkp@gmail.com gcsssrkpsec5@rediffmail.com
		20	Sh. Ajeet Singh	Principal	SBV, Delhi Cantt, New Delhi	1720001	9810565716	1720001sbv@ gmail.com
	South West-B-I	21	Dr. Sukhbir Singh Yadav	Principal	Govt. Sarvodaya Bal Vidyalaya - Shahbad Mohammadpur, New Delhi	1821041	9212280826	sbv1821041shahbad@gmail.com
	South West-B-II	22	Ms. Sunita Yadav	Principal	GGSSS, Paprawat, New Delhi	1822027	9250558043	ggsss1822027@gmail.com
	South	23	Ms. Sonu Nijhawan	Principal	SKV, Green Park Extension, New Delhi	1925032	9873436082	1925032gpe@gmail.com
		24	Sh. Dharam Singh Rathor	Principal	GBSSS, Aya Nagar, New Delhi	1923354	9911039933	gbsss.1923354.ayanagar@gmail.com
	South East	25	Sh. Nand Kishore Sharma	Vice Principal	Lajpat Nagar, Ring Road-SBV (Shaheed Hemu Kalani), New Delhi	1925059	9555011336	principalshksbv@gmail.com shk1925059@rediffmail.com
Centre-3 Link Road, Karol Bagh	Central/New Delhi	26	Sh. Sunil Kumar Sriwastav	Principal	SV, Kitchner Road, New Delhi	2026002	9650047540	hos2026002@gmail.com
		27	Ms. Sangeeta Anand	Principal	SV, (Co-Ed) Lal Kuan New Delhi	2127180	9891794307	hos2127180@gmail.com
		28	Sh.Ajay Kumar	Principal	GSBV, Plot No. 6 Jhandewalan, New Delhi	2128002	9555543891	hos2128002@gmail.com 2128002@doe.delhi.gov.in
Center-2 C-4, Vasant Vihar, New Delhi	South East	29	Ms. Suman Taneja	Principal	SOSE, Kalkaji, New Delhi	1925430	8800201567	1925430soe@gmail.com

List of Government Nurseries

The schools can collect saplings from the following 16 Government Nurseries specially identified for the purpose.

1. Kamla Nehru Ridge Nursery, Dehhi-110007 (Mob. No. 8930306852)
2. ITO Nursery, Bhairon Marg, Near Pragati Maidan, Ring Road, Delhi-110002 (Mob. No. 9992523125/ 9034343524)
3. Hauz Rani City Forest Nursery, Saket New Delhi-110017 (Mob. No. 9548729234)
4. Anand Vihar Nursery, behind ISBT, Anand Vihar Delhi-110092 (Mob. No. 9992007224
5. Alipur Nursery, Seed Farm Road, Alipur, Delhi-110036 (Mob. No. 8800339474)
6. Brar Square Nursery, Delhi Cantt, New Delhi (Mob. No. 9540969954)
7. Badli Nursery near Badli Railway Station, Delhi
8. Najafgarh near SDM office/ Old BDO office, Delhi
9. Kharkhari Jatmat Nursery, Kapashera, Delhi (Mob. No. 9017343435)
10. Sainik Farm Nursery, Near Khanpur, New Delhi
11. Aravali Modern Forest Nursery Tuglakabad near Shooting Range, New Delhi (Mob. No. 8010508052)
12. Qutub Garh University, Jala Wala Road, Qutub Garh, Delhi-110039 (Mob. No. 9891302718/ 8178552210)
13. Pooth Kala Nursery, Sec-20 Extn., Block P-1, Krishan Vihar, Delhi (Mob. No. 9877777691)
14. Mamurpur Nursery, CH Ramdev Marg, Mamurpur, Delhi-110040 (Mob. No. 7217632956)
15. Kondli Nursery near Hindon cut, Delhi-110096 (Mob. No. 9991312119/ 9728115402)
16. Birla Mandir Nursery, Mandir Lane, New Delhi-110060 (Mob. No. 7988959484/ 9017343435).

F.8(179)/Forest/HQ/Plg.-I/Eco-restoration/2022-23

ANNEXURE –I

LIST OF NATIVE TREE SPECIES

S.No.	SPECIES	COMMON NAME	TYPE
1	*Aegle marmelos*	Bael	Tree
2	*Albizia amara*	Krishna siris	Tree
3	*Albizia lebbeck*	Siris	Tree
4	*Albizia odoratissima*	Kala siris	Tree
5	*Anogeissus pendula*	Dhau	Tree
6	*Balanites aegyptiaca*	Hingot	Tree
7	*Bauhinia racemosa*	Jhinjheri	Tree
8	*Butea monosperma*	Dhak	Tree
9	*Cassia fistula*	Amaltas	Tree
10	*Cordia dichotoma*	Lasoda	Tree
11	*Cordia gharaf*	Gondi	Tree
12	*Crateva religiosa*	Barna	Tree
13	*Dichrostachys cinerea*	Goya khair	Tree
14	*Diospyros cordifolia*	Tendu	Tree
15	*Ehretia laevis*	Chamrod	Tree
16	*Ficus virens*	Pilkhan	Tree
17	*Flacourtia indica*	Bilangda	Tree
18	*Gmelina arborea*	Gamhar	Tree
19	*Holoptelea integrifolia*	Kanju/Chudail Papdi	Tree
20	*Mitragyna parvifolia*	Kadamb/Kaim	Tree
21	*Moringa concanenesis*	Wild sonjna	Tree
22	*Moringa oleifera*	Sonjna	Tree
23	*Morus alba*	Shahtoot	Tree
24	*Phoenix sylvestris*	Khajoor	Tree
25	*Phyllanthus emblica*	Amla	Tree
26	*Prosopis cineraria*	Khejri	Tree
27	*Salvadora oleoides*	Khabbar	Tree
28	*Salvadora persica*	Peelu	Tree
29	*Schleichera oleosa*	Kusum	Tree
30	*Senegalia catechu*	Khair	Tree
31	*Senegalia modesta*	Phulai	Tree
32	*Senegalia senegal*	Kumtha	Tree
33	*Stercularia urens*	Kulu	Tree
34	*Syzygium cumini*	Jamun	Tree

35	*Tamarindus indica*	Imli	Tree
36	*Tecomella undulata*	Roheda	Tree
37	*Terminalia bellirica*	Baheda	Tree
38	*Vachellia leucophloea*	Ronjh	Tree
39	*Vachellia nilotica*	Desi babool	Tree
40	*Wrightia arborea*	Kala indrajao	Tree
41	*Wrightia tinctoria*	Doodhi	Tree
42	*Ziziphus mauritiana*	Ber	Tree

ANNEXURE –II

LIST OF NATIVE SHRUBS

S.No.	SPECIES	COMMON NAME	TYPE
1	*Abutilon indicum*	Kanghi/Indian mallow	Shrub
2	*Barleria prionitis*	Vajradanti	Shrub
3	*Calotropis giganea*	Safed aak	Shrub
4	*Calotropis procera*	Aak	Shrub
5	*Capparis decidua*	Kureel	Shrub
6	*Capparis sepiaria*	Heens	Shrub
7	*Carissa spinarum*	Jungli karaunda	Shrub
8	*Ficus palmata*	Anjeeri	Shrub
9	*Grewia asiatica*	Falsa	Shrub
10	*Grewia flavescens*	Pisangna	Shrub
11	*Grewia tenax*	Gangeti	Shrub
12	*Gymnosporia senegalensis*	Kankera	Shrub
13	*Justicia adhatoda*	Adusa	Shrub
14	*Lawsonia inermis*	Mehendi	Shrub
15	*Murraya koenigii*	Curry patta	Shrub
16	*Nyctanthes arbor-tristis*	Harshingar	Shrub
17	*Tamarix dioica*	Jhau	Shrub
18	*Withania somnifera*	Ashwagandha	Shrub
19	*Ziziphus nummularia*	Jhad ber	Shrub
20	*Ziziphus oenoplia*	Makora	Shrub

F.8(179)/Forest/HQ/Plg.-I/Eco-restoration/2022-23

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ANNEXURE -III

LIST OF NATIVE CLIMBERS

S.No.	SPECIES	COMMON NAME	TYPE
1	*Clitoria ternatea*	Blue pea	Climber
2	*Trichosanthes cucumerina*	Jungle chanchinda	Climber
3	*Combretum indicum*	Madhumalti	Climber
4	*Coccinia grandis*	Tindora/Ivy Gourd	Climber
5	*Cardiospermum halicacabum*	Kanphuta/Balloon vine	Climber
6	*Vallaris solanacea*	Roth/Bread flower	Climber
7	*Tylophora indica*	Dam bel	Climber
8	*Cocculus hirsutus*	Patalgarudi/broom creeper	Climber
9	*Cissampelos pareira*	Patha	Climber
10	*Dregea volubilis*	Hemajivanti	Climber
11	*Gmelina asiatica*	Badhara	Climber
12	*Tinospora cordifolia*	Giloy	Climber
13	*Abrus precatorius*	Ratti	Climber

ANNEXURE –IV

LIST OF NATIVE HERBS

S.No.	SPECIES	COMMON NAME	TYPE
1	*Asparagus racemosus*	Satavari	Herb
2	*Ruellia prostata*	Neelambaram	Herb
3	*Chenopodium murale*	Khartua	Herb
4	*Blepharis maderaspatensis*	Doodhiya choti	Herb
5	*Tridax sp.*	Bhringraj	Herb
6	*Eclipta prostata*	Bhringraj	Herb
7	*Malvastrum coromandelianum*	Three lobed false mallow	Herb
8	*Sida acuta*		Herb
9	*Oxalis corniculta*	Common woodsorrel	Herb
10	*Oxalis debilis*	Pink woodsorrel	Herb
11	*Oxalis latifolia*	Large leaved sorrel	Herb
12	*Stellaria media*	Chickweed	Herb
13	*Spergula arvensis*		Herb
14	*Commelina sp.*	Dayflower	Herb
15	*Euphorbia helioscopia*	umbrella milkweed	Herb
16	*Indigofera linnaei*	nine-leaved indigo	Herb
17	*Melilotus indicus*	Jungli methi	Herb
18	*Fumaria parviflora*	Indian fumitory	Herb
19	*Portulaca pilosa*	pink purslane	Herb
20	*Anagallis arvensis*		Herb
21	*Convolvulus pluricaulis*	round leaved binweed	Herb
22	*Rumex spinosus*	Kundiali Palak	Herb

Signed by Amit Anand
Date: 11-02-2023 09:18:16
Reason: Approved

Miyawaki Method and Science

Is the Miyawaki Method based on strong scientific grounds? Are the commonly reported figures credible? For example when saying that Miyawaki urban forests grow 10x faster, 30x denser, with 20x more biodiversity?

URBAN FORESTS
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nicolasdebrabandere@gmail.com

AKIRA MIYAWAKI, THE SCIENTIST

Akira Miyawaki, who developed the method of the same name, is a renowned Japanese botanist. He carried out numerous field researches. First in Germany, where he worked with Reinold Tuexen on the concept of potential natural vegetation at the Federal Institute for Vegetation Mapping. The work forms a firm ground of knowledge that is still relevant today for the whole of Europe.

He then carried out the same work in Japan, where he produced for the entire country maps of existing vegetation as well as maps of potential natural vegetation, vegetation that he found at relict sites where native forests are still present. His maps are still used for scientific research. They serve as a model for reconstructing degraded natural habitats and the native plant environment. His fieldworks were conducted over a period of 10 years, and compiled in a 10-volume publication. His work is appreciated for its contribution to phytosociological research (community of plants living together), by allowing comparison of the architecture and characteristics of the vegetation of different areas of the world.

Much of his scientific work, and related researches, are published in Japanese, and not translated in English. This has not prevented him from achieving a remarkable scientific career, with his reputation crossing borders over many years.

CREATING NATIVE FORESTS FOR ENVIRONMENTAL PROTECTION

The originality of Miyawaki's work is that he described the distance between current forest vegetation and potential natural vegetation. Realizing it, he focused his attention on the importance of native forests and the functions of species diversity and complementarity.

His first field trials showed that plantations, whose composition and structure were as close as possible to what they would be in a native forest in the absence of human activity, grew rapidly and, above all, that they showed very good ecological resilience. Native forests are much more resistant to disturbances, to changes in the environment, to disasters. They also regenerate soils more quickly. He proposed a plan to restore native forests for environmental protection. These forests, even on a small scale, can protect life, infrastructure, and people.

His proposal took a long time to find a favorable echo, but it finally hit the mark, first with industries, which could thus restore degraded environments, then as a means of gaining protection against tsunamis, cyclones, for the fixing of embankments, slopes, and even around a new generation nuclear power plant!

Miyawaki actions have been widely supported by insurance companies, industrialists, communities, developers, and the State.

THE MIYAWAKI METHOD

Classical succession theory, developed by Clements (1916), indicates that it takes 150 to 200 years for native forest with a multi-strate community to restore itself on bare soil in Japan or Europe, and 300 to 500 years or more in tropical Southeast Asia.

Miyawaki postulates that the way of life of modern societies will probably no longer allow, in most cases, the necessary time needed for the regeneration of native forests. He therefore seeks to accelerate the process of ecological healing, by imitating as much as possible the normal composition of the primary forest according to the context. He estimates that he can obtain a restored forest in temperate zone, whose facies and structure (if not the genetic diversity, humus, dead wood, or sufficient amount of senescent stage) strongly resemble the native forest, in 20 to 30 years, that is to say **10x faster**.

In French

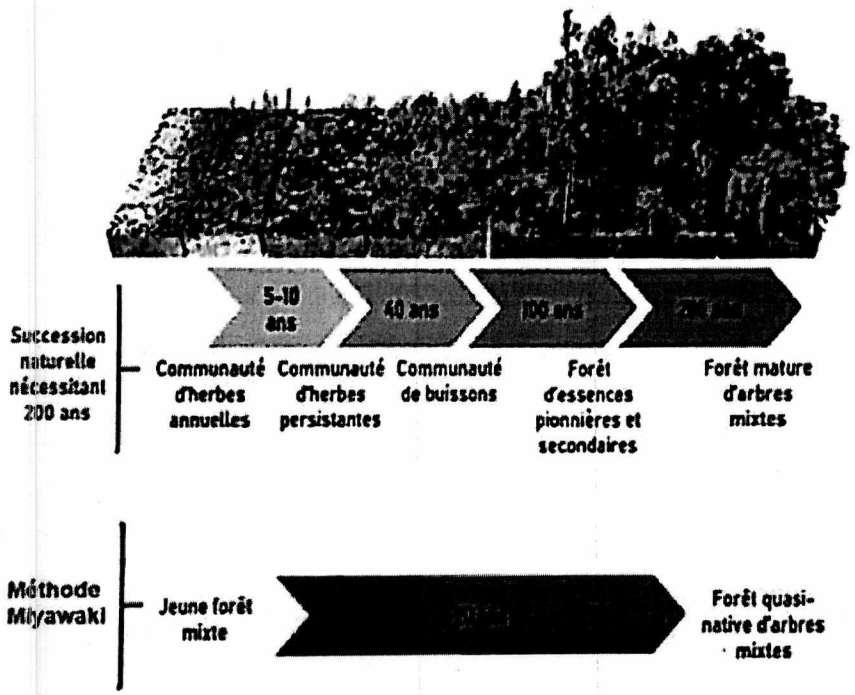

Figure 2 – Comparaison entre la théorie classique de succession et celle induite par la méthode Miyawaki [Adapté de] (Miyawaki, 2004)

The Miyawaki method was presented as exemplary in a preparatory report for the 1992 Earth Summit, and in the Biodiversity Congress 1994 at the Unesco "Biodiversity" symposium in Paris.

The method was also presented in 1991 at the University of Bonn Colloquium, "Restoration of Tropical Forest Ecosystems", and then at the congresses of the International Association for Ecology, the International Society for Vegetation Science,

and the International Botanical Congress, including new aspects linking growth, natural habitat and estimated carbon fixation.

Curiously, despite more than 1000 successful and sometimes spectacular realizations, the western world of forestry or landscaping has rarely attempted to apply or even test the "Miyawaki method". Fortunately, this is changing, although there is still a persistent denial on the part of some academics, researchers, foresters or ecologists.

The most cited criticism of the Miyawaki method is the high cost of the first phase, including soil preparation and the quantity of trees planted. This cost may be justified when considering exceptional degraded sites where conventional methods fail, or in case of difficult urban or industrial sites that require restoration. The method is also beneficial in the protection against environmental risks, pollution, infrastructure, storms, tsunamis.

The Miyawaki also gains interest to intervene on small areas in urban or peri-urban contexts, when ecological restoration is at stake, when results are needed quickly, for reconnection to nature, for aesthetic or landscape reasons, to involve the public, for biodiversity or simply by choice.

NUMBERS AND FIGURES OF THE MIYAWAKI METHOD

Miyawaki also showed, along with other researchers, that the leaf area of a multi-layered forest formed with potential natural vegetation is about 30 times greater than that of a single-layer lawn, which requires periodic maintenance.

With this figure in mind, it is reasonable to consider that a Miyawaki forest is **30x more dense** than a lawn or a meadow, a classical garden or tree plantation. This is important considering that the density, coupled with the complex three-dimensional structure of the forest, create a wide variety of ecological niches (e.g. different plant species attracting different fauna, canopy trees, understory shrubs, herbaceous plants, mosses, lichens, sun, shade, leaves, bark, twigs, soil, litter, roots, forest interior, edges). This complexity offer tremendous potential for a wide diversity of living organisms to move into the habitat thus created. The presence of organisms can be transitory, temporary, permanent, seasonal, or cyclical.

Scientific papers published in English, or other western languages, about Miyawaki forests, do not show comparison in terms of biodiversity between Miyawaki forests and urban or natural forests. It is possible that results are published in Japanese.

The most relevant study so far (Alterra - Animal ecology et al., 2018) to quantify biodiversity in a Miyawaki forest was made in the Netherlands in 1997. This study was conducted over a full year to compare biodiversity in two Miyawaki forests with that of the surrounding woods (control forests). The results on species diversity and number of individuals are clear: the Miyawaki forests, although very recent and small, count much **more biodiversity**, from 2 to 162 times more, on average **18 times more.**

The Miyawaki method is thus grounded on solid scientific documentation and reporting, with numerous experiments carried out in a multitude of contexts. The results are very positive and their practical and societal implications are very instructive. We invite the scientific community to continue the research on Miyawaki forests, on its biology and functioning, as well as on the societal, behavioral, environmental, economic, health and well-being impacts.

For those we wish to go further into the subject, we invite you to read the report produced by Urban Forests in 2020: **The Miyawaki Method, Data and Concepts**, on the website www.urban-forests.com