

അമൃത വാർത്താ പത്രിക



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തൃശ്ശൂർ പദ്ധതിയുടെ
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അമൃത് വാർത്താ പത്രിക

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എഡിറ്റോറിയൽ

അമൃത് പദ്ധതികളിലൂടെ നഗരവികസനത്തിന് സമാനതകളില്ലാത്ത മുന്നേറ്റം ഉണ്ടാക്കുവാനും അടിസ്ഥാന സൗകര്യ വികസനം ത്വരിതപ്പെടുത്തുവാൻ സാധിച്ചു എന്നതും വലിയൊരു നേട്ടം തന്നെയാണ്. പ്രത്യേകിച്ച് നഗരങ്ങളെ ജലഭദ്രതയുള്ള പ്രദേശങ്ങളാക്കാൻ ലക്ഷ്യമിട്ടു നടപ്പിലാക്കി വരുന്ന അമൃത് 2.0 പദ്ധതിയുടെ സ്വീകാര്യതയും പുരോഗതിയും മിഷൻ പ്രവർത്തനങ്ങളെ കൂടുതൽ മികവുറ്റതാക്കുന്നു. ഓരോ ജലാശയങ്ങളും അതാത് പ്രദേശത്തിന്റെ ജീവനാഡിയും മുഖമുദ്രയുമാണ്. സംസ്ഥാനത്തെ നഗരസഭാ പ്രദേശങ്ങളിലെ 371 കൂട്ടങ്ങളാണ് അമൃത് 2.0 പദ്ധതിയ്ക്ക് കീഴിൽ പുനരുദ്ധാരണ, പുനരുജ്ജീവന പ്രവർത്തനങ്ങൾ നടത്തുന്നത്. ഇതിൽ 90 കൂട്ടങ്ങൾ നമുക്ക് പുനരുജ്ജീവന പ്രവർത്തനങ്ങൾ പൂർത്തീകരിക്കാൻ സാധിച്ചു. ഇതിലൂടെ ഭൂഗർഭ ജലസ്രോതസ്സ് നിലനിർത്തുവാനും പ്രദേശത്തെ ആവാസ വ്യവസ്ഥ പുനഃസ്ഥാപിക്കാനും സാധിച്ചു.

തൃശ്ശൂർ നഗരസഭയിലെ കുടിവെള്ള വിതരണം കാര്യക്ഷമമാക്കുന്നതിനും നഗരപ്രദേശത്തെ എല്ലാവർക്കും കുടിവെള്ളം ലഭ്യമാക്കുന്നതിനും ലക്ഷ്യമിട്ട് അമൃത് പദ്ധതിയിലൂടെ നടപ്പിലാക്കിയ വാട്ടർ എഫിഷൻ്റ് തൃശ്ശൂർ (WET) എന്ന പദ്ധതി പൂർത്തീകരിച്ചു. പദ്ധതിയുടെ ഉദ്ദേശ്യം കഴിഞ്ഞ മാസം തൃശ്ശൂരിൽ ബഹു.മുഖ്യമന്ത്രി നിർവ്വഹിച്ചു. അമൃത് 2.0 പദ്ധതിയിലൂടെ മറ്റ് നഗരസഭകൾക്കും ഈ നേട്ടം കൈവരിക്കാൻ സാധിക്കട്ടെയെന്ന് ആശംസിക്കുന്നു.

അമൃത് മിത്ര പദ്ധതിയുടെ ഭാഗമായി 'വിമൻ ഫോർ ട്രീസ്, ട്രീസ് ഫോർ വിമൻ' പദ്ധതി സംസ്ഥാനത്തെ എല്ലാ നഗരസഭകളിലും പൂർത്തീകരിച്ചു വരികയാണ്. മരങ്ങൾ നടുന്നതിൽ മാത്രമല്ല അത് പരിപാലിക്കുന്നതിനും വേണ്ടത്ര ശ്രദ്ധ ചെലുത്തേണ്ടതാണ്. സമയക്രമം അനുസരിച്ചുള്ള പരിപാലനം വൃക്ഷ തൈകൾ ലഭ്യമാക്കി വളർത്തിയെടുത്താൽ മാത്രമെ പദ്ധതിയുടെ ഗുണഫലം സമൂഹത്തിന് ലഭിക്കുകയുള്ളൂ എന്ന കാര്യം ശ്രദ്ധിക്കേണ്ടതാണ്. അമൃത് 1&2 പദ്ധതികളുടെ വിശദമായ അവലോകനം കഴിഞ്ഞ മാസം നടത്തുകയുണ്ടായി. നിർവ്വഹണ ഘട്ടത്തിലിരിക്കുന്ന പദ്ധതികൾ പലതും സമയക്രമം പാലിക്കുന്നില്ല എന്ന കാര്യം ശ്രദ്ധയിൽപ്പെട്ടിട്ടുണ്ട്. അമൃത് പദ്ധതികൾ നിശ്ചിത സമയപരിധിക്കുള്ളിൽ പൂർത്തീകരിക്കേണ്ട പദ്ധതികളാണ്. പദ്ധതികൾക്ക് കേന്ദ്ര വിഹിതം ലഭിക്കുന്നതിൽ തടസ്സം നേരിടുമെന്നതിനാൽ പദ്ധതികൾ നിശ്ചിത സമയപരിധിക്കുള്ളിൽ പൂർത്തീകരിക്കാൻ നഗരസഭകൾ പ്രത്യേകം ശ്രദ്ധിക്കണമെന്ന് ഓർമ്മിപ്പിക്കുന്നു.

മിഷൻ ഡയറക്ടർ



തൃശ്ശൂർ കോർപ്പറേഷനിൽ നടപ്പിലാക്കുന്ന അമൃത് പദ്ധതി കളുടെ പദ്ധതി പ്രദേശങ്ങൾ അമൃത് മിഷൻ ഡയറക്ടർ സന്ദർശിക്കുന്നു



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5 വാട്ടർ എഫിഷ്യന്റ് തുശ്ശൂർ (WET)

7 “വിമെൻ ഫോർ ട്രീസ്, ട്രീസ് ഫോർ വിമെൻ” ഹരിത നഗരം

8 Solids-Free Sewer System:
A Practical Sanitation Solution for Kerala

11 GUIDING REPORT ON ESTABLISHING URBAN FORESTRY WITH MIYAWAKI PLANTATION FOR BIODIVERSITY CONSERVATION AND CLIMATE RESILIENCE TOWARDS A SUSTAINABLE AND LIVABLE FUTURE



കൊല്ലം ഞാണ്ടക്കടവിൽ പൂർത്തിയാക്കുന്ന വാട്ടർ ട്രീറ്റ്മെന്റ് പ്ലാന്റിന്റേയ്ക്ക് എൻ.എച്ച്. റോഡിന് കുറുകെ പെപ്പ് സ്ഥാപിക്കുന്ന ജോലി പുരോഗമിക്കുന്നു.



അമൃത് 2.0 പദ്ധതിയുടെ ഐ.ഇ.സി. യുടെ ഭാഗമായി അടൂർ മുനിസിപ്പാലിറ്റിയിലെ പുതിയകാവിൻ ചിറ പുനരുദ്ധാരണ പ്രവർത്തികൾക്ക് നേതൃത്വം നൽകിയ എസ്.എം.എം.യു., സി.എം.എം.യു. ഉദ്യോഗസ്ഥർക്ക് പത്തനംതിട്ട ജില്ലാ കളക്ടർ സർട്ടിഫിക്കറ്റ് നൽകി ആദരിച്ചു



തുശ്ശൂർ മുനിസിപ്പൽ കോർപ്പറേഷനിൽ അമൃത് പദ്ധതിയിൽ ഉൾപ്പെടുത്തി നടപ്പിലാക്കിയ വാട്ടർ എഫിഷ്യൻ്റ് (WET) പദ്ധതിയുടെ ഉദ്ഘാടനം ബഹു. മുഖ്യമന്ത്രി ശ്രീ. പിണറായി വിജയൻ നിർവ്വഹിച്ചു. തുശ്ശൂർ കോർപ്പറേഷൻ മേയർ ചടങ്ങിൽ അദ്ധ്യക്ഷത വഹിച്ചു. ഓൺലൈൻ ആന്റ് സ്പോട്ട് ബില്ലിംഗിന്റെ ഉദ്ഘാടനം ബഹു. റവന്യൂ വകുപ്പ് മന്ത്രി ശ്രീ. കെ. രാജൻ നിർവ്വഹിച്ചു. ശ്രീ. പി. ബാലചന്ദ്രൻ എം.എൽ.എ., അമൃത് മിഷൻ പ്രധാനമന്ത്രി സുരജ് ഷാജി ഐ.എ.എസ്., വിവിധ രാഷ്ട്രീയ പാർട്ടികളുടെ പ്രതിനിധികൾ, കൗൺസിലർമാർ, ഉദ്യോഗസ്ഥർ തുടങ്ങിയവർ ചടങ്ങിൽ പങ്കെടുത്തു.



മനുഷ്യന്റെ അടിസ്ഥാന ആവശ്യങ്ങളിലൊന്നായ കുടിവെള്ളം ഏറ്റവും കാര്യക്ഷമവും സമയബന്ധിതവുമായി ആവശ്യക്കാരിൽ എത്തിക്കുക, ശുദ്ധജല ശോഷണവും, ജല മോഷണവും കണ്ടെത്തുക, ജലവിതരണ രംഗത്തെ ആധുനികവൽക്കരിച്ച് കാര്യക്ഷമമാക്കുക, നിലവിലുള്ള ജലവിതരണ ശൃംഖല കൃത്യമായി മനസ്സിലാക്കുകയും രേഖപ്പെടുത്തുകയും ചെയ്യുക എന്നീ ലക്ഷ്യങ്ങളാണ് പദ്ധതിയിലൂടെ കൈവരിച്ചിരിക്കുന്നത്. ഏറ്റവും നൂതനമായ സാങ്കേതിക വിദ്യകൾ ഉപയോഗിച്ചാണ് ഇവ നടപ്പിലാക്കുന്നത്. ജി.പി.ആർ. മെഷീൻ ഉപയോഗിച്ച് നിലവിൽ ഭൂമിക്കടിയിലുള്ള മുഴുവൻ പൈപ്പ് ലൈനും മാപ്പ് ചെയ്യുക. ഡ്രോൺ ഉപയോഗിച്ച് നിലവിലുള്ള മുഴുവൻ കെട്ടിടങ്ങളും മാർക്ക് ചെയ്യുക, ഐ.ഒ.ടി., സെൻസേഴ്സ് എന്നിവ ഉപയോഗിച്ച് പൈപ്പ് ലൈനിലെ പൊട്ടലുകൾ പെട്ടെന്ന് മനസ്സിലാക്കി നടപടികൾ എടുക്കാൻ പ്രാപ്തമാക്കുക, ജി.പി.എസ്. ഉപയോഗിച്ച് നിലവിൽ ഉള്ള മുഴുവൻ ഉപഭോക്താക്കളുടെ കെട്ടിടങ്ങളും രേഖപ്പെടുത്തുക എന്നിവയെല്ലാം ഈ പദ്ധതിയുടെ ഭാഗമായി നടപ്പിലാക്കുന്നുണ്ട്. സംസ്ഥാനത്ത് ആദ്യമായാണ് ഇത്തരത്തിൽ ഒരു പദ്ധതി നടപ്പിലാക്കുന്നത്.

പീച്ചി ഡാമിൽ നിന്ന് ജലമെടുത്ത് ട്രീറ്റ് ചെയ്ത് തേക്കിൻകാട് മൈതാനത്തിലുള്ള ഓവർഹെഡ് ടാങ്കിൽ എത്തിച്ച് 18,500 ഉപഭോക്താക്കളിലെത്തിക്കുന്ന സിസ്റ്റം പൂർണ്ണമായും ഓൺലൈനാക്കി. എപ്പോൾ വേണമെങ്കിലും എവിടെ നിന്നും പരിശോധിച്ച് പോരായ്മകൾ കണ്ടെത്താനും പരിഹരിക്കാനുമുള്ള സംവിധാനമാണ് വാട്ടർ എഫിഷ്യൻ്റ് തൃശ്ശൂർ. ജലവിതരണം കുറഞ്ഞാലും, ലൈനിൽ ചോർച്ചയുണ്ടായാലും, അനധികൃതമായി ജലമെടുത്താലും ഇതിലൂടെ അറിയാൻ കഴിയും. 5.59 കോടി രൂപയാണ് പദ്ധതിയ്ക്കായി ചെലവഴിച്ചത്.

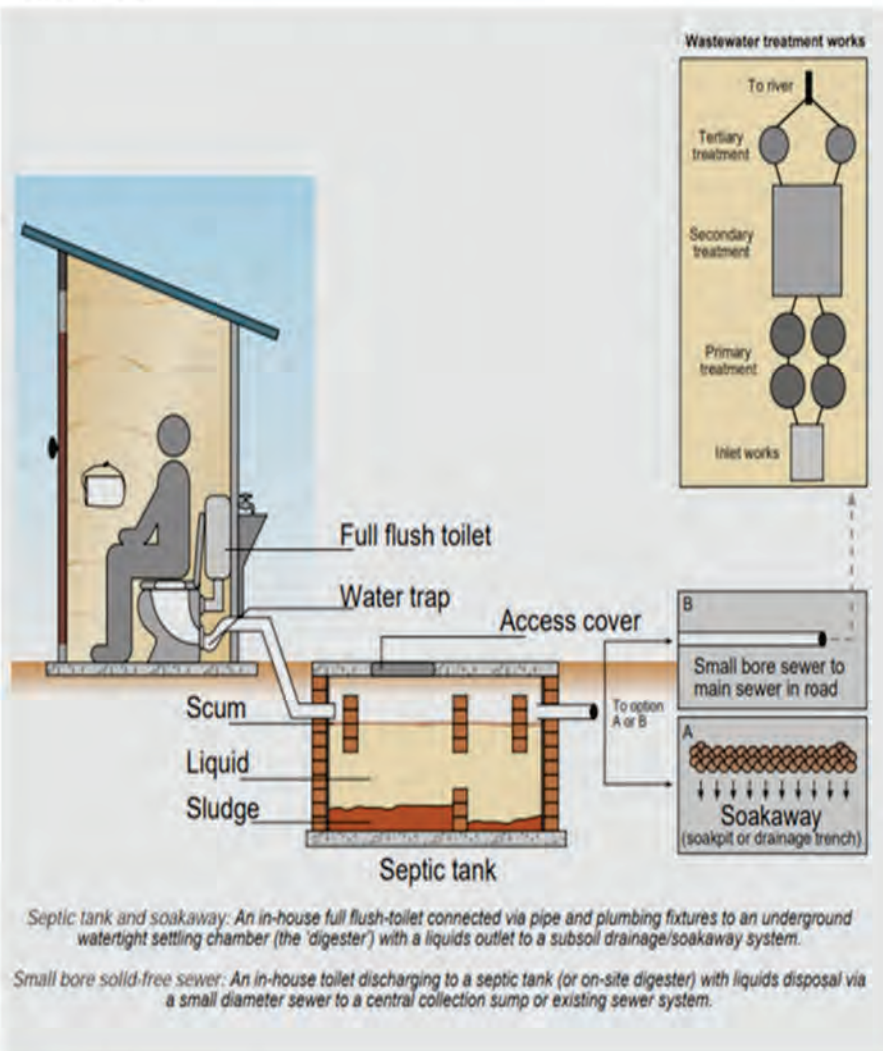


അമൃത് മിത്ര, ഹരിത നഗരം പദ്ധതിയുടെ ഭാഗമായി എസ്.എച്ച്.ജി. അംഗങ്ങളെ ഉപയോഗിച്ച് വൃക്ഷം നൈ നടുന്ന പ്രവർത്തനങ്ങൾക്ക് തുടക്കം കുറിച്ചു. 2025 ജൂൺ 5 മുതൽ സംസ്ഥാനത്തെ നഗരസഭകളിൽ പദ്ധതി ആരംഭിച്ചു.



Solids-Free Sewer System: A Practical Sanitation Solution for Kerala

Kerala's natural features—like heavy rainfall, a high-water table, rocky and hilly terrain, and narrow, crowded streets—make it difficult to install traditional underground sewer systems. In this context, Solids-Free Sewer Systems (SFS) provide a practical, affordable, and environmentally friendly way to manage wastewater.

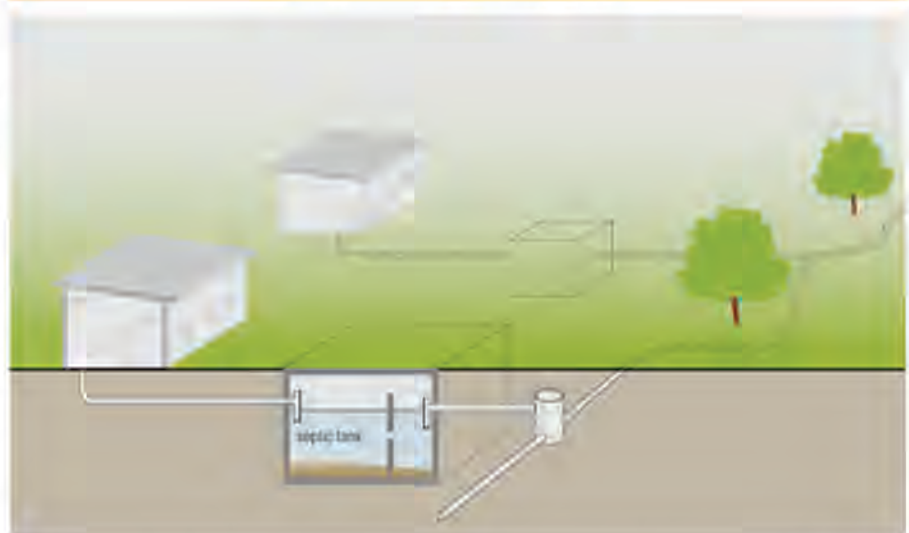


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A solids-free sewer system is a type of drainage system that carries only the liquid part of household wastewater. Before entering the pipes, solids such as human waste and kitchen wastes are removed through a septic tank or similar treatment system placed near the house. Unlike conventional sewers that carry both solid and liquid waste through large underground pipes, solids-free systems use smaller pipes and only transport the liquid portion. Because the wastewater is already treated to remove solids, the pipes can be laid at shallow depths and do not require steep slopes. This allows them to follow the natural shape of the land, even passing over small hills or uneven ground, as long as the general flow moves downhill.

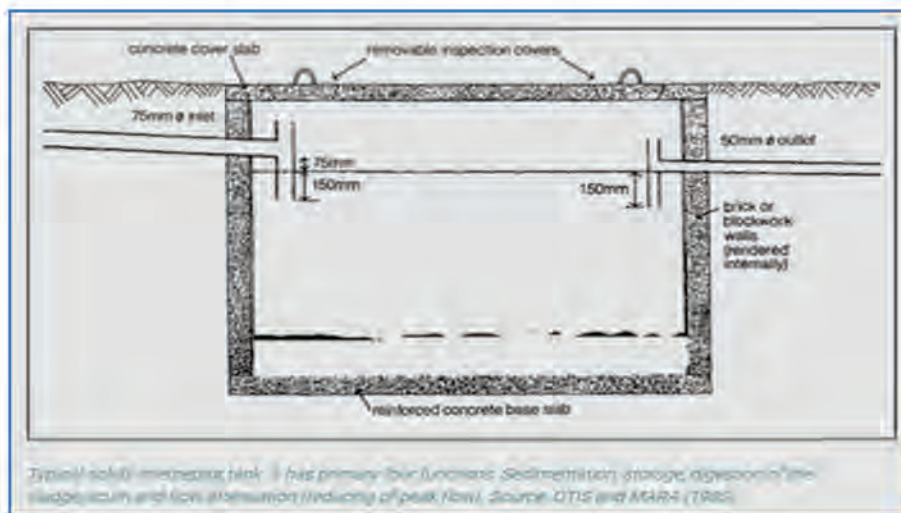
These systems are especially suitable for Kerala because they are easy to install in the state's narrow and congested roads. Since they only require shallow digging, they avoid damaging existing underground utilities such as water and electricity lines. The system is also a good fit for rocky or hilly terrain, where deep excavation would be difficult and expensive. Another major benefit is that the pipes are sealed and less likely to be affected by rainwater or groundwater. This reduces the chances of sewage leakage or blockages during Kerala's heavy monsoon season and helps protect rivers, lakes, and wells from contamination.

Solids-free systems are also much more cost-effective. They can save between 20% to 50% of the cost of building a traditional sewer system because they use smaller pipes and don't require deep trenches or large pumping stations. Operating costs are lower too, as the system uses less electricity and requires less maintenance. These features make the system especially useful for small towns, villages, or spread-out communities where centralized sewer systems would be too expensive or hard to build.



The system helps the environment by preventing sewage from polluting rivers, backwaters, and groundwater. In places like Kerala, where many people depend on wells and rivers for drinking water, this is very important. Treated wastewater from the system can also be reused for watering crops or gardens, which supports sustainable farming and reduces waste. Because the system causes less disturbance to the landscape, it helps preserve Kerala's natural beauty.

A solids-free system depends on having a working septic tank or treatment unit near each home or group of homes. These tanks trap solids and slow down the flow of wastewater, helping protect the small sewer pipes from getting clogged. The septic tanks also act as buffers during times of high-water usage. However, these tanks must be cleaned regularly to keep the system working properly.



From a design point of view, solids-free systems are flexible and easy to adapt to different conditions. Because the water flowing through the pipes does not contain solids, it does not need to move quickly. The system can work well without steep slopes and can even handle stretch of pipe that are under pressure or slightly uphill. Ventilation is needed at high points to prevent air from getting trapped in the system, and it is important that the water level in the septic tank is higher than the level in the pipes to avoid backflow. Pipes can be curved to avoid buildings, rocks, or other obstacles, which reduces the need for digging. A minimum pipe size of 75 mm is recommended to make cleaning easier if needed.

Instead of traditional manholes, this system uses cleanout or flushing points for maintenance. These are usually sealed tightly to keep rainwater out and are placed at the beginning of the pipe network, at high points, and where the direction or size of the pipe changes. Although some water might still enter the pipes from the ground, using good-quality materials like PVC and accounting for minor leaks during design can help reduce problems.

Solids-free sewers are best used in medium-density towns or village areas, especially where the land is rocky or uneven and digging deep is hard. They are also useful in places where people use septic tanks but can no longer safely drain wastewater into the ground due to poor soil or high groundwater. The system works well in places where water use is low, and where there is little space for building large sewer lines or treatment plants. It is especially helpful in communities where traditional sewers are not affordable or practical.



Small bore system typical layout.

To work properly, the system needs to be built and maintained by trained people. A local authority, a community organization, or a private contractor should be responsible for regular cleaning of septic tanks, fixing any pipe blockages, and checking for illegal or unsafe connections. Periodic flushing of the system helps prevent buildup, and scheduled maintenance ensures the system stays safe and clean.

If the system is built well and properly maintained, it can provide a hygienic and reliable way to manage wastewater. However, community support and education are key to success. People need to understand how to use and maintain the system safely. Proper disposal of collected waste and good health practices during cleaning or repairs are also important.

Overall, solids-free sewer systems offer many advantages. They work well in uneven land, cost less to build and maintain, and are better suited to Kerala's terrain and weather. They can be expanded as communities grow and fit easily into crowded areas. On the other hand, they do require space for septic tanks, regular cleaning, and good management to avoid problems. Leaks are rare but can be hard to detect, and proper design is essential.

In conclusion, solids-free sewer systems are a smart and suitable sanitation solution for Kerala. They match the state's unique challenges and offer a clean, affordable, and sustainable way to handle wastewater. With good planning and community involvement, they can protect public health, conserve nature, and support Kerala's development in the years to come.

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GUIDING REPORT ON ESTABLISHING URBAN FORESTRY WITH MIYAWAKI PLANTATION FOR BIODIVERSITY CONSERVATION AND CLIMATE RESILIENCE TOWARDS A SUSTAINABLE AND LIVABLE FUTURE

Introduction:

The Honourable Prime Minister of India, Shri. Narendra Modi in one of his episodes of 'Mann ki Baat', discussed the concept of Miyawaki plantation. He shed light on the Japanese technique of establishing dense urban forests in limited spaces. He also mentioned the inspiring story of **Raafi Ramnath, a teacher from Kerala, who utilized the Miyawaki method to convert a barren piece of land into a miniature forest named Vidyavanam at Vignjana Vilasini Higher Secondary School (VVHSS) at Thamarakulam in Alappuzha district of Kerala has set up an herbal garden with 150 plants and a Miyawaki forest with over 450 trees on campus. The students of Vignjana Vilasini Higher Secondary School (VVHSS), have been learning the values of environmental conservation while being part of several green initiatives. With the consistent effort of the students and the staff over several years, the school successfully set up a lush herbal garden as well as a Miyawaki model forest within the campus. Likewise, "Pachathuruthu" is a high-impact, community-led green initiative spearheaded by the Honourable Chief Minister of Kerala Shri. Pinarayi Vijayan under the Haritha Kerala Mission. Since its inception in 2019, it has transformed thousands of small land patches into vibrant mini-forests. These green pockets support biodiversity, combat climate change, and enhance urban resiliency—while empowering local communities. Such urban forestry models are crucial in Kerala's Urban Local Bodies (ULBs) to combat air pollution and improve air quality in densely populated areas. It helps in reducing the urban heat island effect, making cities cooler and more liveable.**



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Miyawaki forests, with their rapid growth and dense structure, are ideal for increasing green cover in limited urban spaces. **These forests support native biodiversity, creating habitats for birds, insects, and other wildlife. Urban forestry enhances climate resilience by sequestering carbon and reducing the impacts of climate change like flooding and rising temperatures.** Green spaces play a critical role in managing urban water cycles by improving groundwater recharge and controlling surface runoff. They offer mental and physical health benefits to residents by providing recreational and stress-relieving spaces. Miyawaki forests require minimal maintenance and deliver long-term ecological and economic benefits to cities. Incorporating urban forests into city planning aligns with Kerala's sustainable development goals and promotes community involvement. These initiatives enhance urban aesthetics, improve liveability, and attract tourism, contributing to the overall development of ULBs.

What is Urban Forestry?

Urban forestry refers to the management and care of trees and forests within urban areas. It encompasses a range of practices aimed at promoting the health and sustainability of urban trees and green spaces. Urban forestry plays a crucial role in enhancing the quality of life in cities, mitigating environmental challenges, and contributing to a more sustainable urban environment.

What is the need of Urban Forestry?

The rapid urbanization and expansion of cities have led to the loss of natural habitats, a decline in biodiversity, and increased pollution levels. There is a pressing need to address these environmental challenges by creating green spaces within urban areas. The Miyawaki forest offers a sustainable and effective solution to restore biodiversity, improve air quality, and enhance the overall well-being of urban communities.

Types of Urban Forestry:

1. Street Tree Planting:

Street tree planting involves the deliberate selection and planting of trees along urban streets and sidewalks. These trees provide numerous benefits, including shade, improved air quality, and aesthetic enhancements. Proper selection and maintenance are crucial to ensure the health and safety of these trees.

2. Green Belts:

Green belts are areas of open space or undeveloped land surrounding or within urban areas. They serve as buffers between urban and rural areas, preserving natural habitats and promoting biodiversity. Green belts can also offer recreational opportunities and act as carbon sinks.

3. Arboriculture:

Arboriculture is the practice of caring for individual trees in urban settings. It involves tree pruning, disease management, and overall tree health assessment. Arborists play a vital role in maintaining the safety and aesthetics of urban trees.

4. Community Forests:

Community forests are managed forested areas within urban areas, often owned and maintained by the community. They provide educational and recreational opportunities, as well as a source of locally harvested wood products. Community involvement is essential for their success.

5. Park and Green Space Management:

Managing parks and green spaces in urban areas involves maintaining and enhancing these areas for the public's benefit. Activities include landscape design, maintaining trails, managing wildlife habitats, and providing amenities for recreation. Well-maintained parks contribute to the overall well-being of urban residents.

6. Urban Orchard and Medicinal Plant Cultivation:

Urban orchards/medicinal value plantation involves the cultivation of fruit-bearing trees and medicinal value shrubs and trees within cities. They provide fresh, locally grown produce, contribute to urban food security and Health make up promoting sustainable management and great Economic Value. Proper care and maintenance are essential to ensure productive and healthy orchards and medicinal plantations.

Only native or naturalized fruit-bearing trees (e.g., **Jamun, amla, guava, jackfruit, mango, tamarind etc.**). Indigenous medicinal plants (e.g., **Neem, Tulsi, ashwagandha, moringa, arjuna, giloy etc.**).

Miyawaki Methodology Adaptation can be done for Greater Economic Benefits:

Planting in high density (3-5 saplings/sq. m) with multilayer structure:

- ♦ **Medicinal herbs (ground layer)**
- ♦ **Shrubs/small trees (under storey)**
- ♦ **Fruit trees (canopy and emergent layers)**

Organic soil enrichment using compost, cow dung, biochar, and mycorrhiza etc...

Urban Integration:

Target unused or underutilized urban land (school yards, hospital campuses, institutional premises, parks, housing colonies, bigger pond and tanks with buffer areas are best suitable etc.).

♦ Fast-growing greenery with minimal maintenance post-3 years.

♦ Enhances urban food security, herbal access, and carbon sequestration.

♦ Acts as urban heat island mitigator, improves air quality.

♦ Provides pollinator habitat and supports local ecology.

Community & Economic Linkage:

Creating urban herbal & fruit clusters for community/SHG based caring and harvesting of fruits and medicinal valued commodities.

Potential for AYUSH-linked urban herbal gardens and other nutritional security programs by cultivating of local appropriate fruit and medicinal species suitable for location-based soil characteristics and minor review of soil properties and its amelioration suitable for fruit cultivation and medicinal plant cultivation through Miyawaki approaches can be thought off.

Urban Forestry in India:

Urban forestry in India is gaining importance due to rapid urbanization and its associated challenges. Currently, India has a relatively low urban forest cover compared to its rapidly urbanizing population.

The extent of urban forestry varies across states and cities in India. Initiatives like the Green India Mission, AMRUT Mission and Smart Cities Mission promote urban forestry. Efforts are being made to increase tree planting and improve green infrastructure.

Objectives of Urban Forestry:

1. Environmental Conservation:

Urban forestry aims to protect and enhance the urban environment through the preservation and planting of trees and other vegetation.

2. Air Quality Improvement:

It seeks to mitigate air pollution by absorbing harmful gases and particulate matter, thus promoting cleaner and healthier urban air.

3. Temperature Regulation:

One of its goals is to provide natural shade and reduce the urban heat island effect, helping to maintain comfortable temperatures in cities.

4. Biodiversity Enhancement:

Urban forestry strives to create and maintain habitats for a variety of wildlife within urban areas, promoting biodiversity.

5. Stormwater Management:

It aims to reduce stormwater runoff and the risk of flooding by using trees and vegetation to absorb rainwater.

6. Community Health:

Urban forestry contributes to improved mental and physical health by providing green spaces for recreation and relaxation.

Economic Benefits of Urban Forestry:

It supports local economies by enhancing property values and reducing energy costs through strategic tree planting and maintenance.

Carbon Sequestration:

Urban forestry plays a role in carbon sequestration, helping to combat climate change by capturing and storing carbon dioxide.

Scope of Urban Forestry:

Tree Planting and Maintenance: This involves selecting suitable tree species, planting, and ensuring proper care and maintenance.

Green Infrastructure: Urban forestry extends to the planning and integration of trees and vegetation into the urban infrastructure, such as streetscapes and parks.

Urban Planning: It is concerned with incorporating green spaces and trees into urban development plans and zoning regulations.

Education and Outreach: Urban forestry programs often include educational initiatives to raise awareness and engage communities in tree care.

Research and Innovation: Ongoing research in urban forestry explores new techniques, technologies, and species for better urban tree management.

Policy and Regulation: Developing and implementing policies and regulations that protect and promote urban trees is an essential aspect of urban forestry.

Tree Health Management: Monitoring and addressing issues like diseases, pests, and environmental stressors that affect urban trees.

Community Engagement: Engaging residents and stakeholders in tree planting and care initiatives to create a sense of ownership and stewardship.

People's Participation in Urban Forestry:

Community Engagement: Encourage residents to actively participate in tree planting, care, and maintenance efforts in their neighbourhoods.

Public Awareness: Conduct awareness campaigns to educate the public about the importance of urban forestry and its benefits.

Volunteer Programs: Establish volunteer programs to involve citizens in tree planting events, tree care workshops, and urban forest maintenance.

School Initiatives: Collaborate with schools to integrate urban forestry into the curriculum, fostering environmental education from an early age.

Citizen Science: Engage citizens in collecting data on tree health, species diversity, and environmental conditions to inform urban forestry management.

Tree Adoption Programs: Allow residents to adopt and care for specific trees in their communities, creating a sense of ownership and responsibility.

Neighbourhood Associations: Encourage neighbourhood associations to take a proactive role in maintaining and expanding urban forests within their communities.

Green Spaces for Social Gatherings: Promote the creation of green spaces that can be used for community gatherings, events, and recreational activities.

Policy Advocacy: Support citizen advocacy groups in advocating for urban forestry-friendly policies and regulations at the local and regional levels.

Green Jobs and Training: Offer training programs and job opportunities in urban forestry, particularly in underserved communities, to promote economic inclusion and skills development.

Genesis of the Miyawaki Model

Prof. Akira Miyawaki, the internationally renowned Japanese botanist, developed a very precise model of afforestation that focuses on promoting Potential Natural Vegetation. The methodology was developed in the 1970s, with the basic objective to densify green cover within a small parcel of land. The method involves creating dense, multi-layered forests that grow rapidly and mimic the natural biodiversity of native forests.

In these times when all conscientious individuals, organizations and governments are thinking of effective ways to fight climate change, the Miyawaki Model urban micro forest presents itself as the most successful game-changer. One of its greatest advantages is that it empowers even those who have little time or space to spare to contribute towards mitigating climate change. This single aspect itself makes the Miyawaki forest a hugely viable and widely accepted model, across countries and continents with varying climates and cultures. It can fit into school playgrounds, road sides or vacant spaces near dwelling places, and simulate a natural forest within a very short span of time.

Promotion of Miyawaki's Project Relevance Today are:

1) Global Priorities

- 2030 Agenda for Sustainable Development (SDG Goals)
- Sendai Framework for Disaster Risk Reduction

2) India's National Priorities

- National Mission for a Green India
- National Mission on Sustainable Habitat

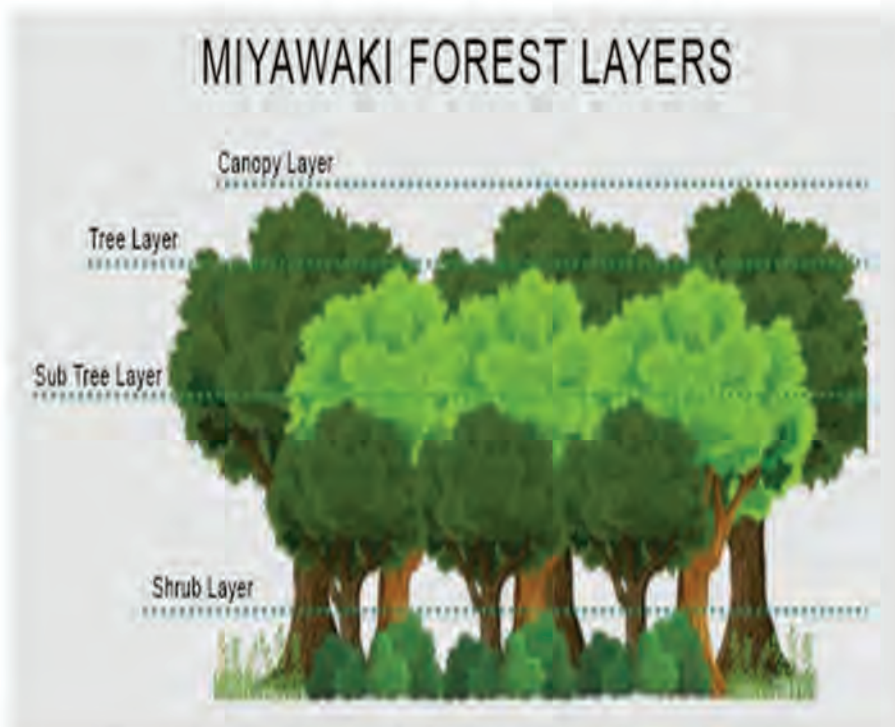


Figure:1 Layers of plantations in Miyawaki system



Figure:2 Miyawaki Methodology of Plantation in Urban Regions.

Objectives of Establishing Miyawaki forest in Urban Areas:

- ♦ Establishing a Miyawaki forest in a designated urban area, utilizing the Miyawaki method of planting local native tree species.
- ♦ Enhancing urban greenery by restoring and preserving native plant species and creating a self-sustaining forest ecosystem.
- ♦ Promoting biodiversity conservation by providing a habitat for local wildlife, including birds, insects, and small mammals.
- ♦ Improve air quality and mitigate the effects of pollution by sequestering carbon dioxide and other pollutants through the dense vegetation of the Miyawaki forest.
- ♦ Raise awareness and educate the local community about the importance of urban forestry and the benefits of the Miyawaki method.
- ♦ Develop a replicable model for future implementation of Miyawaki forests in other urban areas.

Target Beneficiaries:

The project will benefit various stakeholders, including:

Urban residents: The Miyawaki forest will provide a natural and serene space for residents to connect with nature, relax, and engage in recreational activities.

Local Biodiversity: The forest will serve as a habitat for various Birds, Insects, Butterflies, Reptiles and other living creature and contributing to ecological balance.

Local government and municipalities: The project will assist local authorities in achieving their sustainability and environmental goals, enhancing their reputation as green cities.

What are Miyawaki forests?

- ♦ The method involves creating dense, multi-layered forests that grow rapidly and mimic the natural biodiversity of native forests.
- ♦ This method involves planting two to four different types of indigenous trees within every square metre.
- ♦ The plants used in the Miyawaki method are mostly self-sustaining and don't require regular maintenance like manuring and watering.

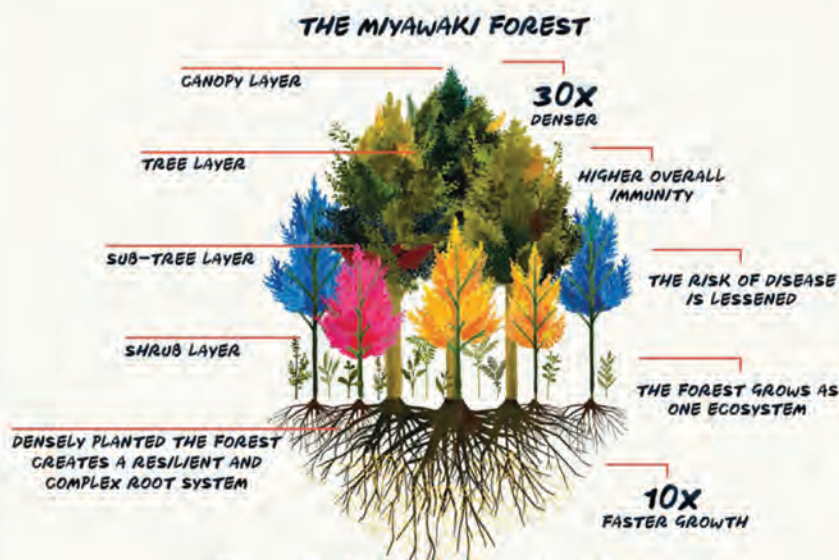


Figure:3. Miyawaki forest out lay.

What are the Key principles of the Miyawaki Method?

Biodiversity:

Planting numerous native species in close proximity to encourage natural competition, symbiotic relationships, and the development of a self-sustaining ecosystem.

Dense planting:

High-density planting of trees ensures that the canopy closes quickly, minimizing sunlight reaching the ground. It reduces the weed growth, thus enhancing the growth of tree saplings.

Soil preparation:

The soil is carefully prepared by adding organic matter, nutrients, and microorganisms to create a fertile and conducive environment for tree growth.

Mulching:

Mulch is applied to the forest floor to retain moisture, suppress weed growth, and enhance soil fertility.

Regular maintenance:

Proper care and maintenance, such as watering, weeding, and monitoring, are crucial during the initial years to ensure the successful establishment of the forest.

What are the Benefits of Miyawaki Method?

Rapid forest Development:

Miyawaki forests have a remarkable growth rate, with trees reaching maturity in a much shorter time compared to traditional plantations. This is due to the dense planting and carefully prepared soil, which promote rapid canopy closure and efficient resource utilization. A study revealed that Miyawaki forests grow 10x faster, are 30 x denser and contain 100x more biodiversity.

High biodiversity:

The Miyawaki Method emphasizes the planting of a wide variety of native species in close proximity. These forests become thriving habitats for birds, insects, and other wildlife, contributing to overall ecosystem health and resilience.

Enhanced carbon sequestration:

The dense vegetation and rapid growth of these forests enable efficient carbon absorption, helping to mitigate climate change and reduce greenhouse gas emissions.

Improved soil quality:

The careful soil preparation in the Miyawaki Method results in the enrichment of soil fertility and structure.

Noise and air pollution reduction:

Miyawaki forests planted in urban areas can help mitigate noise pollution by acting as sound barriers and absorbing sound waves. Additionally, they contribute to improving air quality by absorbing pollutants and particulate matter, thereby reducing air pollution levels.

Sustainable water management:

The dense vegetation of Miyawaki forests act as natural sponges, absorbing rainfall and reducing runoff, thus contributing to better water retention and preventing water pollution.

Regulates surface temperature:

Miyawaki forests can help regulate surface temperatures, particularly in urban areas where the urban heat island effect is a concern. The urban heat island effect refers to the phenomenon where urban areas experience higher temperatures compared to surrounding rural areas. This is due to human activities, the presence of buildings and pavement, and the lack of vegetation.

** What is Carbon Sequestration?

Carbon sequestration refers to the process of capturing and storing carbon dioxide (CO₂) or other greenhouse gases from the atmosphere to mitigate climate change. It involves removing carbon dioxide from the atmosphere and depositing it in long-term storage locations, preventing its release back into the atmosphere.

** What is Biodiversity?

Biodiversity refers to the variety of living organisms, including plants, animals, microorganisms, and their ecosystems, as well as the genetic diversity within species. It encompasses the richness and variety of life on Earth, from the tiniest bacteria to the largest animals and the complex interactions between them.



Figure:4. Benefits of Miyawaki Method.

Requirements for Afforestation through the Miyawaki Method:

The Miyawaki afforestation method requires quite a small space, at least 20 square feet. One must seed plants very close to save space and dense plant growth. This will also allow young trees to protect each other and block sunlight from hitting the forest's ground, preventing parasitic plant growth. This process must attain plant growth 10 times faster, and vegetation 30 times denser than usual. One must maintain such a forest for at least 3 years, according to the Miyawaki method.

Process of Afforestation through Miyawaki Method:

Step 1: Examine the Soil Texture and Measure Biomass

Examining soil texture is essential as it helps determine fertility, water retention, percolation, etc. All these elements determine the growth and longevity of the forest. Then one must measure the existing biomass of the soil. An afforest can add the following biomass to prepare the Earth:

Organic fertilisers: The ground requires fertiliser to provide nutrients for plant growth. Some organic fertilisers are cowpat, goat muck and vermicompost.

Perforating materials: These materials are helpful for plants to penetrate their roots deeper into the ground. Rice husk, wheat husk, or groundnut shells can be an excellent resource to increase perforation.

Water retainers: A ground must have significant water retention power to develop a forest. An afforest can add coconut coir and peat moss to strengthen the soil's water retention power.

Mulch: It is usually layered over the ground to protect it from the scorching sun. It is vital, especially for saplings, as their growth may be affected in dried soil. Afforests can use decaying leaves, dried bark, or even composts.

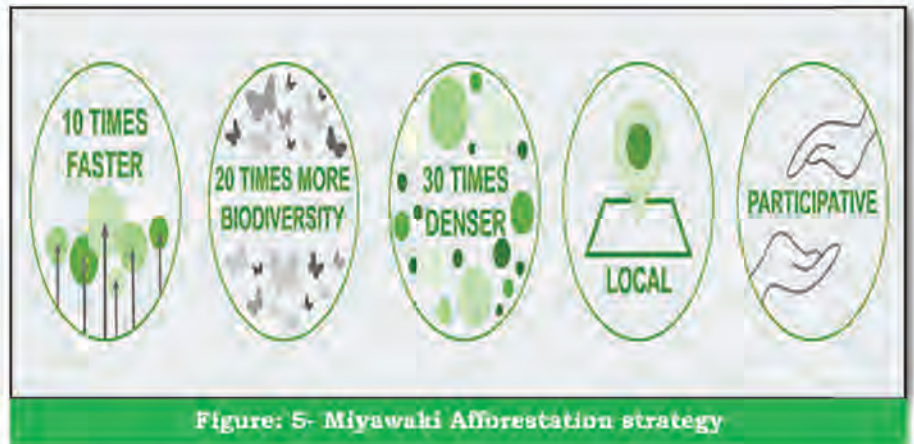


Figure: 5- Miyawaki Afforestation strategy

Step 2: Select Native Species for Plantation:

Afforests/planters must select the native plant species and identify their genus (deciduous or evergreen), height and influence on nature. Foresters/ planters must allocate those plants in layers, depending on all the above factors.

40 to 50 per cent of the total number of trees must comprise the most commonly found species in one's neighbourhood. Foresters must choose at least 5 different genera that would be the significant species in that forest. Some moderately found native species will compose 25 to 40 per cent as supporting plants. Finally, some other minor species will constitute the rest of the forest. Afforests need to collect saplings of these species, which must be in a minimum height of 60 to 80 cm.

Step 3: Prepare the Ground and Equip the Forest Area

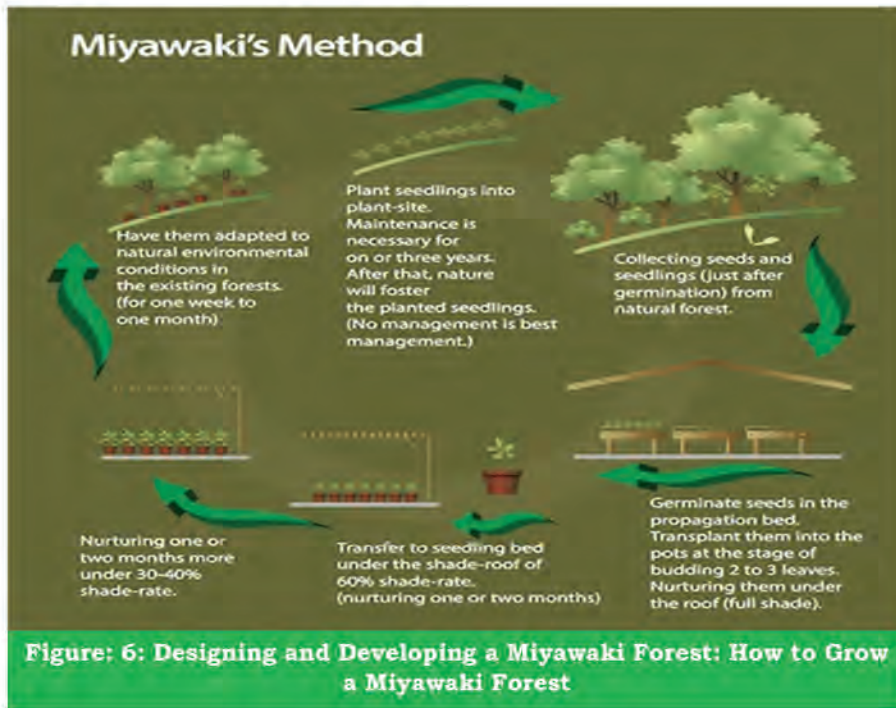
Before starting the planting process, afforests/planters must inspect the ground to determine the possibilities and practicality of this project. The soil of this area must be clean from any debris and weed. It also must catch sunlight for at least 8-9 hours a day to start afforestation under the Miyawaki method. Foresters must install irrigation facilities, create 100 sq metre mounds and demark those before sowing.

Step 4: Start the Plantation Process

One should dig small holes in the soil and remove the root bag of the seedlings to plant them. He must put these saplings in those holes and lightly level the soil around their stem. It is crucial to choose proper supporting sticks for these plants, according to their height.

Step 5: Take Care of the Forest for the Next 3 Years

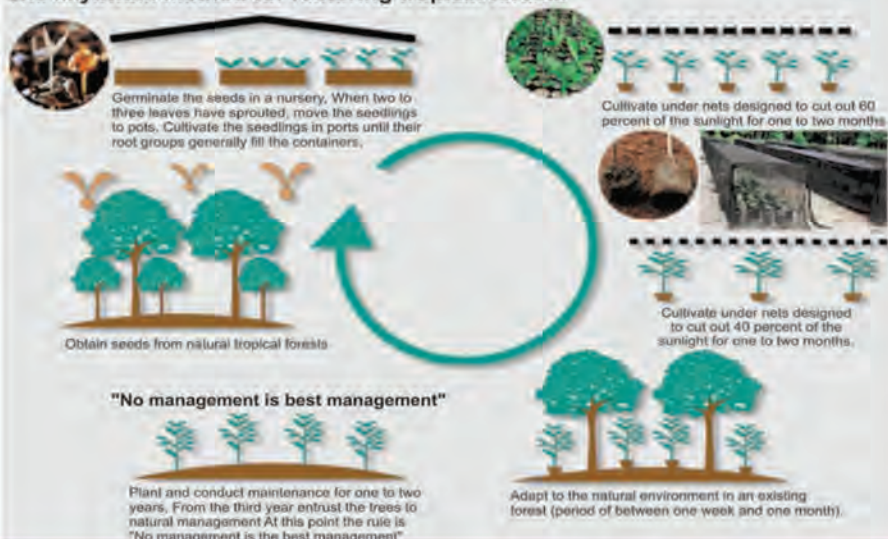
Monitoring the forest involves watering it daily, cleaning the weeds and plastics, and maintaining proper drainage. Foresters/planter must maintain the mulch level and keep changing it for a minimum of 1 year. They also must have an eye on the plant's growth to ensure the mulch does not immerse it. They must not trim the forest, use chemical pesticides and fertiliser, and clean the shed leaves. To sum it up, the Miyawaki method helps create self-sustaining vegetation within 2 to 3 years, whereas a traditional procedure takes nearly 100 years. Nevertheless, some environmentalists question this technique, despite its benefits for nature. According to them, such woods do not have medicinal properties as natural woods. Also, they speak against the forceful speeded photosynthesis of plants.



Miyawaki Method- As a land Restoration tool:

Natural forests function in a different cycle. Forests are made up of more than just trees. It is home to a variety of plants, fungi, wildlife, and microorganisms. This flora and fauna community plays an important role in sustaining the forest and allowing it to thrive. Birds disperse seeds into the forest, animal dung nourishes the land, leaf litter from fallen trees is broken down by decomposers to create healthy soil, and plant roots hold the soil in place. However, the process by which forests grow, generate multiple canopy layers, and become self-sustaining takes time. The Miyawaki method accelerates forest development by constructing soil, utilising native plant diversity, growing healthy saplings, and planting them close together. The Miyawaki method gives a stepwise procedure for restoring native forests. The care given during the initial years of planting ensures that the majority of the saplings planted survive and the forest ecosystem is established in a fraction of the time taken for forests to develop naturally.

The Miyawaki method for restoring tropical forests



To address today's environmental issues, this technique for quickly growing dense forest plants would be quite helpful. To preserve life on the planet and repair harm caused by humans, it is seen as essential to preserve biodiversity and native plants, decrease extinction rates by building habitats, enhance environmental quality overall by expanding forest cover, and use trees as a buffer against natural calamities. The Miyawaki Method is one of the most effective tree planting methods for creating forest cover quickly on degraded land that has been used for other purposes such as agriculture or construction. It is effective because it is based on natural reforestation principles, i.e., using trees native to the area and replicating natural forest regeneration processes. The Miyawaki technique is a potential candidate for attaining objectives to improve world habitability and safeguard ecologically vulnerable areas. A "new option" of coexistence, in which urban areas and forest environments coexist, may be made possible by small, dense forests. These small clusters of forest gradually turn into a massive area. It is also a useful tool in Urban Forestry projects and the development of recreational parks. This area can also be converted as a sanctuary for non-humans in cities and towns. The technique can help restore groves that have been destroyed by deforestation since groves are important for maintaining local biodiversity and controlling environmental health. They can also reduce soil erosion and can also control the force of water and wind. In Miyawaki forest the seedlings are planted at very high densities. This replicates the regeneration process that occurs in a natural forest.

The saplings grow very fast to compete for the light and then natural selection will favour the fastest growing individuals resulting in a densely packed pioneer forest that grows in 20 to 30 years instead of taking 150 to 200 years benefiting from projects that are working to maximise a forest's carbon sequestration potential or recreate habitat for biodiversity and wildlife.

Advantages of Miyawaki Technique:

- ◆ It is a method of afforestation that helps in creating a denser forest than usual in less time.
- ◆ Miyawaki forests also act as a habitat for lots of species living in that region.
- ◆ The Miyawaki forests help in controlling air, water, noise, and soil pollution.
- ◆ The Miyawaki method prevents the flowing away of the top layer of soil in heavy rain as the trees are planted close to each other and a group of trees tightly holds the soil.
- ◆ These trees protect each other from direct sunlight and reduce the chances of forest fires to a great extent.

Disadvantages of Miyawaki Technique:

- ◆ Mostly timber trees are preferred and the natural distribution of tree types is reduced.
- ◆ This method of afforestation is only suitable in the sub-urban or the urban region with smaller spaces but not suitable in the tropical regions.
- ◆ The movement of wildlife species is restricted due to less availability of space between the trees the natural movement of the ecosystem is restricted.
- ◆ The amount of rain brought by the trees of the Miyawaki forest is still a question mark.

Growing a Miyawaki Forest in Kerala

Numerous Miyawaki forests have successfully been established in Kerala and in other parts of India. There is also a rise in the popularity of the Miyawaki method in Kerala with the state tourism department announcing a 'Miyawaki Forest project' in 2020 with the objective of developing 22 forests using the Miyawaki Method and with the emergence of grassroot collectives that promote education regarding the Miyawaki method. Indian businesses offering services to grow compact forests on private landholdings using Miyawaki techniques have also entered the market. Kerala has a rich diversity of native plants, numerous of which serve as food and medicine. This diversity allows a grower to pick from a wide array of plants that can serve to increase the ability of the forest to provide for the grower (specifically as food and raw material for therapeutic uses). Further the abundance sunlight and rainfall throughout most of the year allow Miyawaki Forests to establish themselves, grow tall and dense rapidly. Creating such native forests serve to protect native plant diversity, local wildlife and provide protection from environmental degradation (preventing erosion and improving the water table). The Miyawaki method has provided a useful blueprint for agencies and stakeholders involved in afforestation to increase green cover, restore native forests, mitigate climate change and environmental disasters. Now the time has come up to go for urban forestry through Miyawaki techniques in all the ULB's under various Central Sponsored schemes and convergences of fund if any...

Cost v/s benefits of Miyawaki forest in Kerala:

The stress is now to create forests that grow quickly, contain dense vegetation, and require little to no time for management. Miyawaki forests often require less initial cost of funds, which may include installing a watering system, labour costs for planting and the first few years of development, the price of saplings, and the price of soil additives. **The establishment of several prosperous Miyawaki farms in Kerala cost between ten and twenty lakhs.** In the long run after the initial period of growth, investment requirements are little to none. Additionally, the growers can increase the economic value of their forests by incorporating **high-value native timber trees and creating "Miyawaki Fruit Forests", by providing forest tours, nature walks and educational sessions.** These forests benefit growers in various ways, including controlling the soil's overall health, preventing soil erosion, raising the water table, and facilitating access to water. Increasing green cover and creating a microhabitat for neighbourhood biodiversity enables the producer to favourably impact broader climate change-related issues. In the Miyawaki technique trees are planted, and they develop much more quickly, accelerating the process of creating forests and absorbing more carbon. The best part of the technique is that after three years saplings become maintenance-free or self-sustainable Miyawaki woods have been shown to have higher biodiversity than nearby woodlands, making them an excellent choice for rapidly establishing diversified forest ecosystems. Being capable of rapidly establishing diverse, healthy forests could be crucial in fulfilling international targets and addressing these concerns in light of the current climate change emergency and alarming warnings about worldwide biodiversity loss.

Conclusion:

The Miyawaki Plantation method, has emerged as an innovative and effective way to create dense urban forests. This Japanese technique, with its focus on native species selection, high plant density, soil preparation, mulching, and regular maintenance, has the potential to transform barren lands into thriving ecosystems. With its numerous benefits such as rapid forest establishment, carbon sequestration, biodiversity conservation, and environmental improvement, cultivating orchards and medicinal plants ensure nutrition and Health values and allied economic benefits. the Miyawaki method holds promise in addressing urbanization and climate change challenges and are essential to create healthier, more resilient, and more liveable urban environments for current and future generations.

**“In Kerala's heart of cities, where green dreams Grow,
The Urban and Miyawaki forests swiftly Show—
Tiny plots, yet thick with Grace,
A breathing patch in concrete Space.
Roots run deep, the future is very Clear,
A forest blooms; We hold it very Dear”.**

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PROGRESS AS ON 30.06.2025

AMRUT-PHASE 1



TOTAL PROJECTS

1108 Nos.



COMPLETED

**1044 Nos.
(94.22%)**



ONGOING

64 Nos.



EXPENDITURE

**2225.50 Cr.
(95.19%)**

AMRUT-PHASE 2



TOTAL PROJECTS

737 Nos.



COMPLETED

131Nos.



TO BE COMPLETED

606 Nos.



EXPENDITURE

478.71 Cr.

