PEAKS

THE PKC NEWSLETTER

ISSUE 2: JUN - SEP
2023

PUNE KNOWLEDGE CLUSTER

Established by the Office of The Principal Scientific Adviser, to the GoI under The City Knowledge & Innovation Cluster Initiative (CKIC), the Pune Knowledge Cluster aims to bring together Academic Institutions, R&D organizations, Industries, NGOs, Civic Bodies, Local & State governments to collectively work for the betterment of Pune City by leveraging the science & technology capabilities of its partner organizations.

FROM THE PKC DESK

Greetings, dear readers!

We are back with the next issue of PEAKS - PKC's Quarterly Newsletter!

In this issue, we would like to highlight key milestones from PKC's journey for the months of **June to September 2023**. The **Cover Story** and **Sneak Pea**k sections highlight key projects from the PKC verticals, while the section - **In Conversation** introduces readers to one of PKC's partner organizations. Through the **Team Connect** section, we would like to showcase our diverse team who helps realize PKC's vision.

This issue will also give an overview of the **Events, Citizen-Centric Talks and Collaborations** that PKC has organized and fostered and inform the readers about **PKC's Offerings**.

Happy reading!

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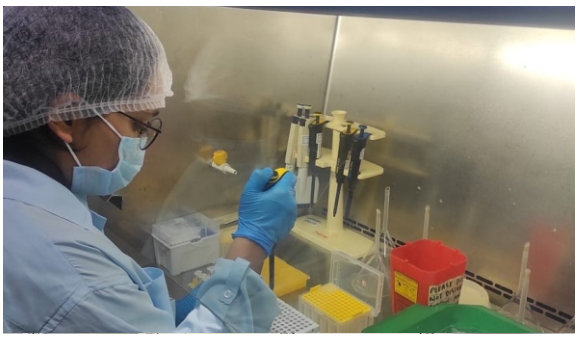
COVER STORY



Wastewater Surveillance for infectious diseases: Shifting the paradigm of public health monitoring systems

The COVID-19 pandemic served as an important learning ground to understand the efficiency of existing public health surveillance systems. It also demonstrated a need towards designing newer disease surveillance strategies, which would improve the pandemic preparedness of the country.

A pan-India consortium – Alliance for Pathogen Surveillance Innovations (APSI) was created in August 2021 to build capacity and understand the emergence of new COVID-19 variants using novel strategies that are defined by socio-demographics, such as: environmental surveillance of COVID-19 as a complement to human surveillance, which can eventually become a support towards early interventions. Led by the CSIR- Centre for Cellular and Molecular Biology, Hyderabad and supported by the Rockefeller Foundation, APSI has built a robust multi-city ecosystem for environmental surveillance, and more specifically Wastewater Surveillance (WWS) (also known as Wastewater Based Epidemiology or WBE) for COVID-19. Members of the APSI consortium include research organisations, hospitals, pathology labs, and data analytics firms from four cities in India - Pune, Bangalore, Hyderabad and Delhi.

"PKC is an active member of APSI. During the pandemic, PKC brought together a group of collaborators- including civic bodies, research organisations and private institutions to facilitate WWS in Pune. The Pune Wastewater Surveillance Project (PWSP) was designed in order to track as well as identify new COVID-19 variants across the city and enable the local authorities to make data-driven decisions." says Priyanki Shah, Senior Project Manager, who has helmed this project at PKC.

The PWSP involved - development and testing of protocols for collection of wastewater samples (which in turn required permissions and advice from civic authorities), analysis of samples to check for the presence of the SARS-

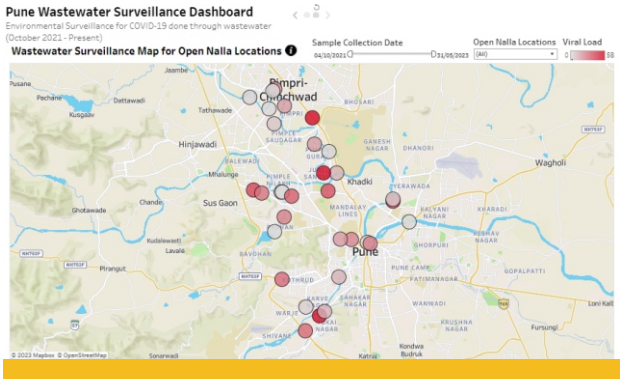
CoV-2 virus, as well as sharing and discussing the data with local authorities. Till date, over 4000 wastewater samples from sewage treatment plants and open nallas in Pune Municipal Corporation (PMC) as well as Pimpri Chinchwad Municipal Corporation (PCMC) have been analysed for presence of the virus, by experts from CSIR-National Chemical Laboratory (NCL) led by Dr. Mahesh Dharne and Symbiosis School for Biological Sciences (SSBS), led by Dr. Santosh Koratkar.

Emphasising the importance of WWS, Dr. Dharne says "Clinical surveillance mainly relies on symptoms displayed by the patient and in COVID-19, many patients were asymptomatic. Such patients would act as super-spreaders and there was no way to track them. However, a WBE approach is able to detect the presence of the virus from day one, regardless of any symptoms displayed by the patient. CSIR-NCL has submitted weekly/ fortnightly/ monthly reports to the PMC health and sewage department officials in order to keep them informed about the changes in trends of the virus, so that they can take suitable steps."

In the context of using WWS to understand community spread of disease, Dr. Koratkar, says "Since WWS is a non-invasive method, it is much more helpful in analysing regional or city-level disease spread, by capturing emerging mutations/variants. Regular monitoring can give a quick snapshot of the spread of disease. In fact, studies have shown that WBE is superior to clinical testing for understanding the geographical spread of the disease, and in predicting its distribution within a community."

While WWS data provided some interesting insights, it was necessary to represent this data in a manner that could be useful for civic authorities and the extended research community. For this, PKC collaborated with Computer Science Engineering students from the MIT-ADT University for developing a digital dashboard, which depicts the distribution of the virus across different geographical areas of the Pune city, in a user-friendly format.

The dashboard can be viewed ***here*** and is updated bi-weekly.



Mr. Bryce Ferreira, one of the students from MIT-ADT University who was actively involved in building the Pune Wastewater Surveillance Dashboard shares his experience of working on the project, "My main responsibility was to create insightful visualisations from a comprehensive dataset, by translating complex results into meaningful and actionable insights for decision-making. The work has reinforced my passion for data science and has inspired me to continue exploring innovative ways in which technology can be leveraged to solve real-world challenges."

Although this data refrains from making any direct inferences regarding real-time COVID-19 prevalence, it is a powerful tool for local authorities to track and monitor the disease, especially when there is little clinical testing. Learnings, capacities and insights built over the last two years through the PWSP are now being used for other communicable diseases including viral, fungal and vector-borne, as well anti-microbial resistant bacteria (AMR).

"Waste water surveillance became a critical part of the fight against the Covid-19 virus, not just as an indicator at the macro scale but also to understand micro neighbourhood patterns. The study and dashboard developed by PKC has build onto that strength not just for the virus but also against other indicators including anti-biotic resistant bacteria etc. which can go a long way in a city's monitoring and prepared-ness.", concludes Mr. Shekhar Singh, IAS, Commissioner, Pimpri Chinchwad Municipal Corporation.

In this issue of PEAKS, we are ***In Conversation*** with **Ms. Sunita Sule**, who heads Country Development, Sustainability, CSR, and Government Relations at BASF India Ltd. She has over 25 years of experience in the chemical industry in India, Germany, Belgium, and Hong Kong. She actively contributes to Sustainability Forums like the UN Global Compact Network, India as Vice President of the Western Region Council and is also part of the Regional Task Group of the Alliance to End Plastic Waste.

IN CONVERSATION

MS. SUNITA SULE

Director, Country Development and Government Relations

Could you briefly talk about the history of BASF-India and its primary focus areas?

A transnational company rooted in Germany, BASF in India focuses on the domestic market and its operations for the country. We have a very strong legacy and brand in the chemical industry space in India for over 130 years. We had a legal presence in India even before the country's Independence and are the only listed company apart from BASF-SE (BASF- Societas Europaea).

Today we have a strong footprint of around 2.7 billion Euros, 39 offices and 8 production sites, with more than 2300 employees throughout the country. BASF-India also has two R&D sites: one in Mumbai- also known as the BASF Innovation Center and another in Mangalore. We are largely a B2B-focused company and provide high-quality performance drivers for industries across diverse sectors like agriculture, pharma, construction, textiles, automotive etc.

BASF also does a lot of work in the social sector. What do your CSR initiatives mainly focus on?

The CSR portfolio of the company has evolved over the years. We started our community work with donations, and then gradually moved CSR discussions to the Boardrooms - bringing in regulations, structure, and framework, while defining our primary focus areas. Today, we mainly focus on two Sustainable Development Goals

(SDGs)- SDG 4 (Quality Education) and SDG 6 (Clean Water and Sanitation).

Through our CSR projects we try to merge the national priorities with the core philosophy of the company, and all our projects are usually linked to either our core area of operation i.e., Chemistry, or our geographical location.

The whole idea for us is to achieve depth, rather than width, and I believe that only if a strong bond is created between the company and the CSR projects, can the work be truly sustainable.

Since our employees routinely volunteer to be a part of CSR projects, we prefer our CSR projects to be located geographically closer to our regular sites of working so that better monitoring as well as employee engagement can be achieved.

How do you identify CSR partners? How important is collaboration with the government for sustaining CSR projects?

What we really look for in CSR partners is an openness to listen, to customize, the ability to commit as well as deliver; and what is also important for me, is the people. Because, at the end of the day, people drive projects.

When it comes to the government sector, I believe that it is important for us to link our work with them- be it central government or the local government. Because it is only if we work together, that we can leverage and synergize the strengths as well as benefits of different stakeholders and achieve much more as a society.

We have worked in close collaboration with the local governments of Bharuch on a project titled 'Livable Bharuch', where we contributed towards better sanitation facilities. The work involved direct collaboration with the district collectorate who then linked us with their local NGOs.

How is working with a cluster different as compared to other organizations, especially for the CSR projects? Can you share your experience of working with PKC?

If you have a focused problem that needs a defined solution, then individual organizations work better. However, when you need to brainstorm and develop things at an early stage, and a certain flexibility as well as customization is required, then a cluster is perfect because by leveraging the network of the clusters, we can truly get the best on the table.

Further, as an industry gaining the understanding, knowledge as well as access to the academic world is possible only because of a cluster. For example, two of our current programs with PKC involve close work with the academic institutions - the ***WEnyan Scholarship Program*** and ***ChemAmaze*** - the Gamification of Chemistry Education.

For the WEnyan Project, PKC had the network of academia through which we got the right people to be involved as mentors. For the Gamification project, getting IIT-Madras involved has been absolutely crucial.

I knew immediately after interacting with the PKC team that our joint initiatives would work well. Their approach to stakeholders reflected passion and the zeal to get things done! There is a certain openness and flexibility that PKC offered in their work, and meanwhile the proximity of Pune with Mumbai helps in getting work done faster.

Speaking of WEnyan – which is a program centered around women, how do you see its contribution in getting more women participation in the chemical industry in the future?

The participation of women in the chemical industry is low, mainly because it is a strongly manufacturing/ R&D driven industry. So, the entire ecosystem i.e., the society, the academia, the government, the organizations/ industries, needs to work together to bring about sustainable changes. As an industry, we believe that we can facilitate a transition, if there is a certain push from the government, and the women themselves are willing to take that leap.

When the idea of WEnyan was being conceptualized, we were looking for partners, who would be able to bring in the right kind of people- as mentors, so that ambitious young women, especially from the tier 2 and tier 3 cities could see and believe that a career in the chemical industry is possible; and PKC has that network of academia. Through the WEnyan Scholarship Program, we want to facilitate the entry of more women in the R&D sector in Chemistry (but also broadly in STEM), who are ambitious and talented, but may not have the required funds and support to move ahead.

Could you share some success stories and upcoming CSR projects you are excited about?

One of the success stories that is really close to my heart is the BASF Kids' Lab which was introduced in India in 2004. We started it simply as a community endeavor and today it has evolved into a CSR initiative for underprivileged children. We undertake city tours and invite students from municipal schools between the ages of 6 to 12 years for a hands-on chemistry lab experience. The topic for this year is Climate Protection, so students are inspired to become Climate Champions and get to perform experiments revolving around climate change and the role of chemistry in mitigating these changes.

Apart from this, we are developing a bridging program for underprivileged women through a three-way partnership with Somaiya Vidyavihar University and the Indian Chemical Council (ICC). Women will be trained and upskilled to increase their employability. The rationale of this program is to build a better linkage between the academia and the industry, and through the ICC we can ensure that a group of companies can come together and offer jobs or internships to this trained batch of students.

SNEAK PEAK

"We are working on an initiative that would 'nudge' the citizens of Pune towards adopting sustainable transport modes." says Ms. Anita Kane, Senior Advisor at PKC.

For the past six months, the sustainable mobility team at PKC along with PKC's partner organizations - Save Pune Traffic Movement (SPTM) and Centre for Environment Education (CEE), has been working in close collaboration with the Pune Mahanagar Parivahan Maha mandal Limited (PMPML) to design and implement a project that could address pertinent issues of greenhouse gas emissions, as well as traffic congestion, by improving sustainability in the transport sector, which contributes to over 24% of emissions.

The initiative titled 'Behavioural Nudges for Sustainable Transport' focuses on designing evidence-based 'nudges', to bring about sustainable changes in utilization of public transport vehicles, over personal automobiles.

"Through controlled experiments, we will quantify the impacts of various types of nudges on the utilization of public transport by the citizens of Pune." says Harshad Abhyankar, Director, Save Pune Traffic Movement.

'Nudges', as described in the 2008 book by Richard Thaler and Cass Sunstein, are non-intrusive interventions that lead to an alteration in people's behaviour in a predictable way, without forbidding any options or significantly changing their economic incentives.

Accordingly, this project is designed in a manner that would encourage the citizens of Pune to view public transport as an optimal and economically viable option, in comparison to their own personal vehicles. In order to design these nudges, it is crucial to understand the mindset of the passengers of the PMPML buses, and their incentives in choosing that particular mode of transport.

In addition, bus routes have to be chosen for implementing the "nudge" intervention. The following steps helped in achieving this purpose:

- PMPML's bus operations data for the past 15 months was analysed to shortlist routes for the interventions

- A passenger survey, in which bus passengers were interviewed, was conducted to understand their motives, their preferences for using PMPML services as well as the service improvements that they would like to see

- A boarding-alighting survey, for the shortlisted routes gave an idea of the route profile- i.e. identification of the stops with significant boarding-alighting activity

- A bus-stop survey, in which the physical aspects of a bus stop such as infrastructure, signage, accessibility etc. were examined in order to determine its influence in decision-making of citizens

“Through these surveys we determined that on certain routes, more that 35% of the bus stops have no physical indication like a shelter/pole/information board, while almost 80% of the bus stops that are marked on Google Maps, show a mis-match between the marking and the actual on-ground location.”, says Mr. Shreyas Khade, Project Assistant at PKC who designed and led these surveys.

Findings from the surveys have been discussed with the PMPML leadership, but more importantly, they are being used to design pilot nudge experiments. Pilot nudges that have been identified include: (a) Information & Communication Nudge (b) Better bus shelters with signages (c) Improved bus frequency. The design for these nudges is in progress and implementation will be prioritized in coordination with PMPML.

The Information & Communication Nudge for a selected route, would involve outreach to institutions and Resident Welfare Associations in the catchment area of the route, use of digital and telecommunication platforms to disseminate information, and spreading awareness about the available bus route.

Through the other two nudges, it will be ensured through PMPML, that all bus stops on a designated route have physical signages displaying the relevant information, and the bus frequency is improved as per requirement. The impact of the nudge experiments will be assessed by studying the changes in the ridership, as well as through nudge adoption surveys.

“Results from these nudge experiments will enable transport providers - PMPML and Maha Metro to take evidence-based decisions that can be most effective towards improving sustainability in the transport sector.”, concludes Ms. Kane.

NATIONAL & INTERNATIONAL EVENTS

This section showcases events PKC has hosted to promote building of collaborative networks and also highlights events and meetings where PKC has been invited to present its initiatives.

Know More About ENTICE: Energy Transitions Innovations Challenge

7 July and 12 July & 2 August, Pune

PKC and O/o the Principal Scientific Adviser to the Government of India collaborated with the Global Energy Alliance for People and Planet (GEAPP) to host a series of online and in-person interactive awareness sessions about ENTICE: an innovation platform for providing series A and seed funding to advanced stage start-ups in the green energy sector.

Roundtable on One Health, Disease Surveillance and Pandemic Preparedness

10 July, Pune

This G20 Chief Science Advisers Roundtable (CSAR) side event was jointly organized by PKC and O/o the Principal Scientific Adviser to the Government of India under the aegis of India's G20 presidency. The event enabled discussions on designing a reliable public health strategy for disease surveillance and building an early warning system.

For detailed report to the event click the link below (https://www.pkc.org.in/wp-content/uploads/2023/09/G20-report_Health_PKC.pdf).

Educational tour to Vasantdada Sugar Institute (VSI)
19 July, Pune

Under PKC's flagship initiative - **LEAD: Learn | Explore | Access | Discover**, a study tour for graduate, post graduate and doctoral students was arranged to Vasantdada Sugar Institute (VSI), Pune. Students explored state-of-the-art facilities and gained information regarding possible career opportunities at VSI through interactive sessions with experts.

Mohim Kalpavriksha – Tree Plantation Drive
2 - 4 August, Pune

A three-day tree plantation drive was organized by Rootskills together with MIT-ADT. PKC joined this initiative as a technology partner, and introduced the participants to its digital platform- ConnecTree, that can be used for tracking and monitoring plantations.

One-day Workshop on Vector-borne Diseases
4 August, Pune

PKC, in association with Pune Municipal Corporation (PMC) and ICMR-National Institute of Virology (ICMR-NIV), organized a One-day Workshop on Vector-borne Diseases for field workers of Pune Municipal Corporation (PMC). The workshop was aimed at training field workers and creating awareness regarding vector-borne diseases in the city, with special focus on dengue.

India-Denmark Water Technology Innovation Network: Delegation Visit 9-10 August, Pune

PKC hosted a Danish delegation as part of the India-Denmark Water Technology Innovation Network, to explore synergies in research and innovation opportunities between Denmark and India in the water sector, through discussions and site visits.

Five-day residential training workshop on Fiber Optics 21-25 August, Pune

PKC, in collaboration with the Defence Institute of Advanced Technology (DIAT), IEEE Photonics society and Society for Applied Microwave Electronics Engineering and Research (SAMEER) organized a 5-day residential training workshop on Fiber Optics. The workshop introduced participants to the latest research in fiber optics, and provided them with hands-on training in the fiber optics labs at DIAT and SAMEER.

Stakeholder meeting for skill development in Maharashtra 25 August, Pune

PKC hosted a stakeholder meeting for skill development in Maharashtra, which was attended by Mr. Ashish Kumar Singh, IAS, Additional Chief Secretary of the Skills, Employment, Entrepreneurship, and Innovation Department of the Government of Maharashtra and his team. The discussions revolved around enhancing and developing skilling and entrepreneurship opportunities in sectors such as education, community development, innovation labs and industry 4.0.

International Conference on Open and FAIR Data Ecosystem
11-13 September, IIC, Delhi

PKC, in collaboration with India International Centre (IIC), the National Committee-CODATA appointed by the Indian National Science Academy (INSA), and Shree Guru Gobind Singh Tricentenary (SGT) jointly organized this conference to identify aspects of Data Science that will leverage the rapidly evolving digital ecosystem and understand existing impediments in some of the major socio-economically relevant disciplines. The conference also hosted a special roundtable event on 'Digital Twins' and encouraged building of innovative partnerships for addressing future challenges in the field.

EmpowerHER:
Trade, Climate Change & Sustainability Summit
15 September, NSCI, Worli

Dr. Priya Nagaraj was invited to present her views on 'STEM Power: Women in Science, Technology, Engineering and Mathematics' at this summit organized by the Women Empowerment Committee of the Indo-American Chamber of Commerce (IACC), India.

CITIZEN CENTRIC TALKS

PKC's citizen centric talks are aimed at making science accessible to citizens and increasing scientific curiosity. The talks are available on our *Youtube Channel*. They are held online to ensure nation-wide and global participation.

Speaker: Dr. Medha Tadpatrikar
(Director, Rudra Environmental Solutions (India), Ltd.
Topic: Plastic Waste Management | 5 June, 2023

Organized on the occasion of World Environment Day as part of PKC's Sust-En talk series, Dr. Tadpatrikar gave an overview about the various plastic recycling methods in line with this year's theme #BeatPlasticPollution .

Speaker: Dr. Vanita Prasad
(Founder-Director and CTO, Revy Environmental Solutions Pvt. Ltd.)
Topic: The Journey from Scientist to Entrepreneur | 30 June, 2023

As part of PKC's Women Role Model Talk Series, Dr. Prasad shared her entrepreneurial journey and provided insights on how to overcome obstacles as a scientist-turned-entrepreneur. The talk can be viewed ***here***.

COLLABORATIONS

In the last quarter, PKC has signed MoUs for several initiatives under the sustainability & environment and capacity building verticals.

ORIEARTH NATURE FOUNDATION

BiofuelCircle

MIT-ADT UNIVERSITY
PUNE, INDIA
A leap towards World Class Education

D Y PATIL UNIVERSITY
PUNE I AMBI
॥ ज्ञानथीनं जगत् सर्वम ॥

AUDIENCE CONNECT

Citizen Scientists are individuals coming from all walks of life, who are trained by scientists to collect and analyse scientific data.

ONE MILLION GALAXIES

Join our Flagship Citizen Science Program One Million Galaxies to help curate a large astronomical database, by spending only a couple of hours per week, from the comfort of your homes!

Scan QR Code to know more about or email @ citizen.science@pkc.org.in

CALL FOR CITIZEN SCIENTISTS!!

TEAM CONNECT

PKC is happy to provide a platform for young and dynamic individuals who are keen to broaden their horizons and explore new opportunities. Our team members have diverse backgrounds and skill sets. Some are showcased in this issue.

Dr. Ashwini Keskar

Program Manager, Sustainability & Environment

With a background in environmental science and having spent more than a decade in academia and research I have an in-depth understanding of problem design and designing solutions. At PKC, I leverage my skills to build collaborative projects in areas of water, restoration and technology validation.

Ms. Ashwini Lele

Senior Advisor, Sustainability & Environment

Having over 20 years of experience in urban and rural development- both at the policy level, as well as the on-ground planning and implementation, I now leverage my experience and skills to facilitate synergies amongst various stakeholders.

Ms. Atreyee Saha

Research Assistant

Through my role, I am able to raise awareness about climate change, and greenhouse gas mitigation, bringing me closer to my personal mission of blending expertise and advocacy for a more sustainable future.

Dr. Chaitra Narayan

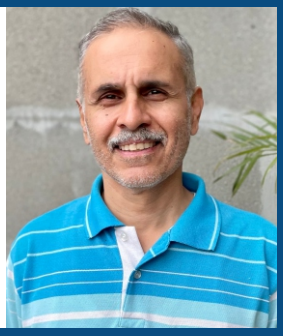
Assistant Project Manager, Health

A physicist by training, my work involves crunching the numbers of the city's health data, to enable the city administrators make evidence-based decisions. It is both a harrowing and humbling experience at the same time, and also keeps me driven.

Mr. Shirish Kanitkar

Consultant, Sustainability & Environment

As an ecologist by passion and a technologist by education with an acquired aptitude for networking, PKC provides me with the perfect platform for utilizing soft technologies to address local ecological challenges.



Ms. Shital Nagpure

Project Assistant

Having an electronics engineering background, I provide technical support for all projects and capacity building activities at PKC, and also help in enabling the WEnyan scholarship program for women in STEM.

Ms. Shraddha Gargatti

Assistant Project Manager, Capacity Building & STEM Education

An engineer by training, I leverage my expertise in STEM initiatives and experience in Science Outreach & Communication to my current role, where I engage with educators and expose young minds to the thrill of scientific discovery through inquiry-based programmes.

Ms. Tejasvini Amit

Project Assistant

Associated with PKC since its early years of inception, I help in building and managing administrative and financial frameworks at PKC.

OFFERINGS AND OPPORTUNITIES

Through this section, we would like to give the readers a peak into some of PKC's unique offerings.

LEAD: Learn | Explore | Access | Discover

PKC's Flagship Initiative - LEAD: Learn | Explore | Access | Discover, provides vocational exposure and networking opportunities to students. Through this initiative, students get to learn about Pune's Science and Technology ecosystem - which includes research institutions, start-ups, and industries through educational tours, field visits and interactions with experts from diverse knowledge-driven sectors.

If you are a student, let us know which industry/R&D institutes you would like to visit through the LEAD initiative by sharing your preference here.

If you are an academic/research institution, start-up or an industry in the S&T sector, & keen to host deserving students on your campus, connect with us at capacitybuilding@pkc.org.in

CONNECTREE

ConnecTree is a customizable digital platform that enables monitoring of newly planted saplings ensuring their long-term survival and growth.

Benefits for Corporates:
Real time mapping & tracking of plantations done through CSR initiatives
Engagement of employees, by involving them in on-ground data collection and analysis

Benefits for Educational & Research Institutions:
Credited activities for students by involving them in the on-ground data collection
Collaborative research projects for estimating carbon stock potential of the city's green cover.

Benefits for Civic Bodies:
Real time mapping & tracking of the city plantations to strengthen the survival of native species, improve the city's green cover and support local biodiversity

To know more or be part of ConnecTree, write to us: treeverse@pkc.org.in

PUNE KNOWLEDGE CLUSTER

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