LOTUS

LOW-COST INNOVATIVE TECHNOLOGY FOR WATER QUALITY MONITORING AND WATER RESOURCES MANAGEMENT FOR URBAN AND RURAL WATER SYSTEMS IN INDIA

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EU and Indian partners of LOTUS met again – now in Mykonos !

After two years of complicated context due to Covid-19 and therefore not being able to meet physically, the Indian and EU partners of the LOTUS project met in Mykonos on the Thursday 2nd and Friday 3rd of June 2022, in conjunction with the Ninth International Conference *on Environmental Management, Engineering, Planning and Economics* (CEMEPE 2022) and the SECOTOX Conference, co-chaired by LOTUS partner Prof. Chrysi Laspidou.

On the first day, the consortium partners started with an ice breaker. The partners were divided into 4 teams with the aim to build the highest structure with spaghettis, a marshmallow, tape and one meter

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Figure 1: Ice breaker - Team 1 (Bérengère Lebenthal, Université Gustave Eiffel, Dilpreet Singh, TU Dortmund, Stellios Mimis & Giannis Adamos, UTH)

rope. All the teams were highly motivated and impressive structures were built (though not very stable)!

After this enjoyable opener, Dr. Svetlana Klessova, G.A.C., the coordinator of the LOTUS project, and Prof. Senthilmurugan Subbiah, Indian Institute of Technology, Guwahati, project manager from the Indian side, welcomed the participants.

Over this first day, intensive discussions were led on core developments of the project: the LOTUS sensor, the LOTUS box and the LOTUS platform, their current status, advancement, challenges and the next steps in the upcoming months. The end-to-end integration of the LOTUS sensor with the LOTUS box, which enables wireless autonomous communication in field conditions, was presented. The performance of the sensor for measuring active chlorine, arsenic and pH in test settings was discussed, as well as the first results from testing in water pipes. Finally, strategies to enhance the stability and repeatability of the sensor in field conditions were debated.

On the second day, the focus was put on the five LOTUS use cases, and strategies for the exploitation and standardization of the project results.

Despite the Covid pandemic, the project has made substantial progress in the development of several monitoring and system management solutions for water systems. A connector for the LOTUS sensor for piped water systems has been developed and will enable the placement of the LOTUS sensor in the water system of Guwahati and its integration into the monitoring solutions developed by IITB and IITG. A complete software solution for the management of fleets of tankers for the delivery of drinking water to households has been developed and a chlorination unit for the tankers built by Autarcon is ready for field testing. TU Dortmund has developed a rolling-horizon model-based optimisation strategy that uses soil moisture information and weather forecasts to provide guidelines to the farmers when and how much to irrigate. The influence of different soil types and of uncertainties in the weather forecast was investigated in simulation studies, showing a robust behaviour. During the coming year, the strategy will be implemented at a trial plot in Jalgaon in cooperation between Jain Irrigation and TU Dortmund.

Lisa Pourcher, G.A.C. also took this occasion to interview and film all the participants for upcoming videos.

The meeting ended with a dinner in the city centre – a nice evening at the seaside to continue technical and non-technical discussions. Many thanks to the organisers from the University of Thessaly, Prof. Chrysi Laspidou, Dr. Giannis Adamos and team!

The next meeting is planned for December 2022 in Guwahati, India.

After the consortium meeting, Dr. Bérengère Lebental (University Gustave Eiffel, France) and Prof. Senthilmurugan left for Paris to meet company representatives from India and France to demonstrate the LOTUS sensor performance in Sense-City and to enable manufacturing of LOTUS sensor in India through advance technology transfer.

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This meeting was also the occasion to meet a new member of our partner's team! Let us present you Dilpreet Singh from the Technische Universität Dortmund (DE):

Dilpreet Singh received a Bachelor's degree in Chemical Engineering at the Panjab University, Chandigarh, in India. As a Master's degree student in Process systems Engineering (PSE) at TU Dortmund in Germany, Dilpreet is strengthening his skills in modelling, simulation and optimisation.

He recently completed his thesis on the "Development of Optimal Irrigation strategy under uncertainty" which is related to the Use Case of the LOTUS project. His work on modelling, state estimation and optimisation has shown promising results in simulation. After finishing the Master Program, he will work in the LOTUS project on the practical implementation of irrigation strategy and extending it to the addition of fertilizers.

STAY TUNED!

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LOTUS Consortium Members

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