BioNano International

Nano-bubbles - Green Solution for Reviving Water Ecosystems

Abstract:

BioNano International, an international nano-technology company with its head office in Singapore, has developed a revolutionary waste or polluted water treatment system based on their proprietary nano-bubble technology to revive water ecosystems. This innovative water treatment system provides an environmental friendly, energy saving and high efficiency solution for waste or polluted water treatment. BioNano's proprietary water treatment system is ideal for cleaning up or rehabilitating water ecosystems of lakes, ponds, rivers and other open water bodies.

BioNano's proprietary water treatment system is radically different from ozone-based water treatment technology. BioNano's water treatment system can produce 200,000 nano-bubbles with the diameters ranging from 50 to 15,000 nm at extremely high pressure and temperature through reaction of air and water producing clusters of radicals. These clusters of radicals produced by BioNano's proprietary water treatment system decompose organic substances, oxidise heavy metals, neutralise stubborn chemical substances in waste or polluted water, and in the process, the suspended substance is attached to the nano-bubbles and then floats to the water surface for removal. The suspended substance can subsequently be decomposed by micro-organisms in the water or be collected as fertilised soil for agriculture use. At the end of the treatment process, the water ecosystem is restored.

During the last three years, BioNano has implemented successful waste water treatment projects in the Greater China region, including Kaohsiung City in Taiwan, Xiamen City and Shenzhen City in Mainland China. The successful project of cleaning the Landscape Lake at Shenzhen Polytechnic in July 2009 is a key milestone in the development of BioNano's business in Mainland China. The project involves the cleaning of the 1.5 square kilometers of open water body within two weeks. The dead lake became alive as a paradise for fish and other water organisms after the BioNano treatment.
BioNano set up its office in Suzhou, China in March 2009 at the Suzhou Industry Park, a high technology industrial park 80 km East of Shanghai City. BioNano set up the office after being awarded RMB10 million (USD1.47million) Suzhou Industry Park Science and Technology Pioneer in October 2008.

BioNano's office in Suzhou, China is currently conducting a project at a river East-bound into Jinji Lake,

which is located within the central business district, Sihui Fang, of Suzhou Industrial Park. BioNano's ambitious goal is to improve the water quality of Tai Hu or Lake Tai, the third largest lake in China, with an area of 2400 square kilometres and water source for three provinces and Shanghai City, by improving its water ecosystem. BioNano is confident that water quality of Tai Hu can be vastly improved through its innovative and environmental friendly water treatment system.

NanoGlobe interviewed the founder, and Chairman of BioNano, Professor Fwu-Shan SHEU, in the Suzhou office of BioNano in June 2009 after BioNano completed the project at the Landscape Lake in Shenzhen Polytechnic (see Fig.1).

NanoGlobe understood from Professor Sheu that BioNano International was founded in 2003 by Professor Sheu and other stakeholders. Professor Sheu received his MSc and PhD degrees in the field of molecular and cellular neuroscience from Northwestern University, USA. He spent 16 years in the US and Hong Kong actively conducting research in functional nano-materials and sensors for application in life sciences. He was invited to join a newly established premier University Scholars Programme offered by the National University of Singapore as Associate Professor in 2000. He is currently a Principle Investigator and Senior Research Scientist of the Nano-biotechnology Research Group in the NanoCore Laboratory of the National University of Singapore. The other key members of BioNano team are established scientists and engineers who are actively involved in the implementation and further development of BioNano's proprietary water treatment system.

BioNano's mission and strategic objective is to actively contribute to the improvement of the environment on this earth that we all live in by restoring water ecosystems using its proprietary and environmentally friendly water treatment system throughout the world.

Fig. 1. Successful lake water treatment project for the polluted Landscape Lake in Shenzhen Polytechnic: the polluted lake water before treatment is shown on the left; the clear and biologically friendly lake water after BioNano's nano-bubble treatment is shown on the right.