

MEMORANDUM OF UNDERSTANDING (MoU)

between

**WATER AND SANITATION AGENCY (WASA), FAISALABAD PAKISTAN
&
DEPARTMENT OF BOTANY (DoB) UNIVERSITY OF THE PUNJAB QUAID-E-
AZAM CAMPUS, LAHORE PAKISTAN**

THIS AGREEMENT IS BETWEEN

The Water and Sanitation Agency (WASA) Faisalabad Pakistan and Department of Botany (DoB), University of the Punjab Lahore Pakistan to work on Research and Development (R & D) joint ventures in the field of wastewater treatment and establish industry-academia linkages to promote demand-driven applied research. The description of the two parties is as under:

- A. WASA FAISALABAD**, Head Office, opposite Allied Hospital, Jail Road Faisalabad, Pakistan.
- B. DEPARTMENT OF BOTANY**, University of the Punjab Quad-e-Azam Campus Lahore-54590 Pakistan

DESCRIPTION OF PARTIES

A. WASA Faisalabad

Faisalabad being the third leading city of Pakistan and second in the province Punjab with its denizens over 3.2 million is being supplied with clean water and services of water disposal and sanitation. The city's authority obligated for providing water supply and sewerage sanitation services is called Water and Sanitation Agency (WASA) Faisalabad. WASA is a subsidiary of Faisalabad Development Authority (FDA) that had been established on April 23, 1978 under the Development of Cities Act 1976 with a view to providing and catering for the services with regard to water supply, sewerage and drainage. Although the provision of first potable water to the city dates back to 1903, the partial sewerage system, however, had been introduced in 1960 to provide facilities to around 0.2 million population. Up to 1978, the Faisalabad Municipal Corporation (FMC) stayed operational for supplying

water and sewerage services in Faisalabad. Geographically, the city Faisalabad has River Chenab flowing about 30km to its North West and River Ravi about 40km to the South East. Over the period, the quality of Faisalabad's ground water except some localities near Rakh Branch Canal has become quite saline and not fit for human consumption. Currently, WASA Faisalabad is administratively aligned to "Housing Urban Development and Public Health Engineering Department (HUD&PHED)" of the Government of Punjab with a total service area of 225 km² that includes 113 urban union councils of four towns with total 260,000 registered consumers. It is estimated that WASA provides about 72% of the city with sewerage services and about 70% with water supply services.

B. Department of Botany (DoB), University of the Punjab Lahore

Established in 1924 and being part of University of the Punjab, Mother University of all the universities in Pakistan founded in 1882; it is the oldest seat of learning in the Pakistan. With its origin in Government College Lahore (currently GCU Lahore), the DoB moved to the Quaid-e-Azam campus of PU Lahore in 1963 and was housed in various buildings until its present building was constructed in 1973. In the past 27 years, DoB has developed very elaborate programs of teaching and research for B.S., M.S., M. Phil., M.Sc. and Ph.D. degrees. The department has recently established well equipped laboratories, doing high quality research in the field of Environmental Biotechnology, Plant Biotechnology, Paleontology, Plant Cell and Tissue Development Sciences, and many others. The Environmental Biotechnology Team of DoB has been conducting research on developing Applied Phytotechnologies for treatment of liquid, solid and gaseous wastes since 2005. The Constructed Wetland Technology (CWT) for treatment of municipal and industrial sewer has been one of the most customized solutions developed by DoB that best fits needs of the local stakeholders in terms of their local strategic circumstances of the discharging wastewater with extreme variability in quantity and quality. The first prototype of CWT is being installed at Botanical Garden, DoB University of the Punjab Lahore. The DoB is committed to expand its R & D collaboration with potential partners like WASA Faisalabad to deliver need-based solutions for wastewater treatment.

PURPOSE OF MoU

The purpose of the MoU being signed between WASA Faisalabad and DoB PU Lahore is to jointly work on Research and Development (R & D) ventures of common interest in the field of wastewater treatment, establish industry-academia linkages to promote

demand-driven applied research and provide customized solutions of municipal sewer treatment for bringing its pollution load well in compliance with the permissible limits set as Punjab Environmental Quality Standards (PEQS).

RESPONSIBILITIES OF PARTIES

Responsibilities of Party A, WASA Faisalabad Pakistan

WASA Faisalabad will:

- facilitate field surveys to its selected sewerage collection centers for collection of samples
- share information about its key problem areas in terms of municipal sewer and its spatio temporal variation in quantity and quality
- facilitate strategically for installation of CWT prototype design developed by DoB PU Lahore at Chakera disposal station of WASA Faisalabad
- facilitate establishment of an extension treatment unit of CWT prototype design of DoB, PU Lahore, at Botanical Garden Research Station of DoB PU Lahore for conducting research related to bringing and applying necessary design alterations in the already developed CWT design in customization with the strategic demands of Chakera disposal station of WASA Faisalabad
- support DoB PU Lahore for research collaboration in the field of Applied Phytotechnologies for wastewater treatment by facilitating its researchers and students

Responsibilities of Party B, DoB PU Lahore

The DoB PU Lahore will:

- conduct sampling and provide facility for laboratory analyses of the sampled sewer
- extend its developed CWT design for testing and commissioning purposes at Chakera disposal stations of WASA with strategic support from WASA Faisalabad
- provide trained human resource for installation of CWT design of DoB PU Lahore and research expertise of research mentors, advanced research mentees of PhD level, consultants and young researchers of MS and BS level from DoB and other Departments of PU if necessary
- provide peer reviewed research feedback on identified and addressed applied research areas of treating municipal wastewater using Applied Phytotechnologies

DURATION OF MoU

This valid duration of the MoU is two (02) years from the date of signing. During the course of execution, if any party realizes that the work is not likely to be completed in the specified timeframe, the matter will be mutually discussed to seek permission for required extension in the timeframe.

SIGNING AUTHORITIES FROM PARTIES

FOCAL PERSONNELS FROM SIGNING PARTIES

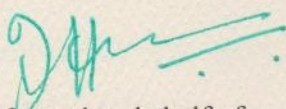
A. From Party A: WASA Faisalabad Pakistan

The focal and contact persons from WASA Faisalabad is Syed Zahid Aziz, Managing Director (MD) WASA Faisalabad.

B. From Department of Botany, PU Lahore

From Department of Botany, the focal and contact person is Dr. Aisha Nazir, Assistant Professor University of the Punjab (New Campus), Lahore.

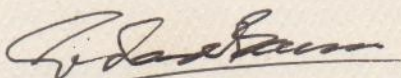
The agreement will be effective upon the date of its signing.



Signed by for and on behalf of
Prof. Dr. Zaffar Mueen Nasar
University of the Punjab, Lahore
Vice Chancellor

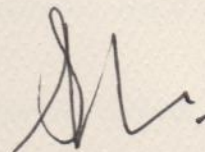
Date: 10-4-2017

Witnessed by:



Prof. Dr. Firdaus-e-Bareen
Chairperson
Department of Botany PU Lahore

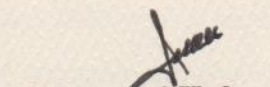
Date: 10.4.2017



Signed by for and on behalf of
Syed Zahid Aziz
WASA Faisalabad Pakistan
Managing Director
WASA Faisalabad

Date: 10-4-2017

Witnessed by:



Muhammad Hafeez
Director,
Water Resources

Date: 10.4.2017