

KU experts to reduce effects of salinisation

By our correspondent
Karachi

The Institute of Sustainable Halophyte Utilisation (ISHU) has initiated a Pakistan-US Science and Technology Cooperation Programme that aims to contribute to the process of domestication of halophytes as a non-conventional cash crop to address the diminishing quality of water and land resources.

The project, mutually funded by the Higher Education Commission and the US State Department, will be completed in a year with the total cost of \$343,510. It is pertinent to mention that this project, proposed by the University of Karachi (KU), is one of 20 which were selected out of 220 proposed projects from different countries of the world.

Apart from helping improve the capacity of the Pakistani researchers involved and building a laboratory infrastructure, the project is also designed to contribute to the reclamation of arid land in Pakistan for productive use by subsistence farmers. This could also lead to new applications that can be extended to other countries as well.

According to the Director of the institute, Professor Dr Ajmal Khan the researchers involved in this project have identified three plant species with potential for use as such non-traditional crops: *Desmostachya bipinnata*, *Suaeda fruticosa* and *Salvadora oleoides*.

They will analyse shoots and roots from each of these species for total protein, carbohydrate, fatty acid, fiber,

ash, ion levels, and biomass when grown under various levels of salinity. Water relations of these plants and compatible osmolytes will be determined. In addition, enzyme activity levels, gene expression for proteins involved in photosynthesis and oxidative stress will be analysed, he said.

This work will provide a basic level of understanding of the capabilities and properties of each of the three species and lead to the identification of useful parameters to characterise the potential use of these and other halophyte species as non-traditional crops, he also said.

Dr Ajmal said that since water logging and salinity are two of the major environmental and economic problems in Pakistan and a number of other arid and semi arid regions of the world, the need of the hour is to take immediate measures.

He added that the ISHU at KU is capable of conducting the proposed research because it has the requisite instrumentation as well as trained and skilled human resources to complete this work. At a later stage, the participation of both institutions will be required.

The mechanism would be developed to train students and faculty in Karachi by inviting students and faculty from the US for brief workshops and online lectures. This would allow investigators from Pakistan to develop the capability to conduct experiments for other halophytes with potential for development, he further said.

It is expected that after successful completion of the funding period, the Pakistani side

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would be able to conduct this type of research independently. However, further collaboration between the laboratories would be strengthened and is expected to continue, Dr Ajmal expressed.

This project is likely to develop the capacity of the Institute at the KU to carry out molecular biology research independently. The benefits would include the purchase of basic instruments needed to carry out molecular research, training of junior faculty members in U.S. laboratories, exchange visits and short training of senior faculty, smaller workshops for a week or 10 days to train students in Pakistan by U.S. partners, he said.

"On the other hand, we would be able to develop non-conventional halophytic crops which could provide a source of income to the owners of low-productivity or abandoned salt-prone soils.

In addition, we can identify molecular and biochemical markers for salinity tolerance which may be used in the future to introduce salinity tolerance in conventional crops and can strengthen the relationship between the laboratories for continuing collaborations in the future", the director informed.

The overall benefits would include reduced salinisation and protection of water resources; environmental conservation through enhancement of soil organic matter; increased areas of recovered abandoned lands; enhanced use of food-feed crops; increased productivity of livestock and increased income per unit farm, he concluded.

