

# The Nation

## Foreign scientists visit mangrove ecosystems

April 20, 2018

KARACHI - During third day of international conference organised by Institute of Sustainable of Sustainable Halophyte Utilization (ISHU), University of Karachi a field trip to the mangrove ecosystems of the Karachi coast was arranged with the help of Pakistan Navy.

Vice chancellor UoK, Prof Dr M Ajmal Khan, Dr Benno Boer (Advisor Science, UNESCO Thailand), Director ISHU Prof Dr Bilquees Gul and Prof Dr Han W Koyro from Justus Liebig University Giessen of Germany also accompanied the participants on the field trip. Participants of the conference surveyed the mangrove ecosystem in detail and took some useful data about the health of the mangrove plants on many spots.

Dr Benno along with Prof Bilquees Gul and ISHU faculty also studied feasibility of establishing floating mangrove forests. Both foreign and national experts agreed that these important ecosystems are under threat of anthropogenic activities and need serious efforts for conservation. These mangrove ecosystems are major primary producers, which provide both ecological and economic services. They act as natural nursery of coastal fauna, shield coastlines from erosion by wave action and also protect inland areas during storms and tsunami.

On this occasion, vice chancellor Prof Ajmal Khan, Director ISHU Prof Bilquees Gul and foreign scientists thanked Pakistan Navy for arranging the useful trip in very short time, which transformed the conference into a practical experience for the participants. The scientists also lauded the services of Pakistan Navy in conservation of Mangroves in coastal areas. Dr Ajmal Khan and Dr Bilquees Gul also discussed the prospects of collaboration with Pakistan Navy regarding promotion of research on Mangroves. Pakistan Navy plants around one million mangroves every year which is highly commendable, said Dr Ajmal Khan.

# DAWN

## Cultivation of salt-tolerant plants can help ensure food security

Faiza Ilyas, April 18, 2018

KARACHI: Keeping in view the increasing scarcity of fresh water in the world, there is a dire need to focus on nature-based solutions to help tackle the challenges posed by food insecurity. Halophytes, for instance, offer great opportunity to utilise unused salty water and saline land and grow crops for food and animal fodder.

These points were shared by experts at a conference which opened at Karachi University (KU) on Monday. Titled ‘Sustainable Development: Halophytes for Green Revolution’, the four-day programme has been organised by the university’s Institute of Sustainable Halophyte Utilisation (ISHU). Speaking on the second day of the event, Prof Hans-Werner Koyro of Justus Liebig University Giessen, Germany, highlighted the importance of halophytes as a future resource to reduce water crisis in the arid world.

Halophytes — plants that can tolerate high concentration of salts — he pointed out, could be used as a potential crop for food, fuel, fibre, fodder and medicines.

“These plants have evolved mechanisms to tolerate high salinity. In many parts of the world, several halophytes are cultivated on commercial scale and even sold on the markets,” he told the audience, emphasising the need for identifying more halophytic crops and agronomic means for their mass-scale cultivation.

He also talked about using biochar, the charcoal produced from plant matter and stored in the soil as a means of removing carbon dioxide from the atmosphere, to deal with increased soil salinisation. He was of the opinion that cultivation of halophytes on saline land was a viable option to ensure food/fuel security in future and that could also reduce pressure on conventional agriculture.

Prof M. Ashraf, former chairman of the Pakistan Science Foundation (PSF), shared details of his work on salinity tolerance mechanisms in plants. Understanding the mechanisms underlying salinity tolerance, he said, was the key prerequisite to enhance salinity tolerance of crops.

He also talked about the key aspects of plant metabolism which could be utilised as the targets of genetic engineering to develop new crops for saline land.

Dr Benno Boer, adviser science, Unesco (Thailand), spoke about the importance of biosphere reserves, protected areas set aside for conservation purposes and to act as a site for ecological and environmental monitoring and research, and said that there were 669 biosphere reserves in the world. Of them, only two existed in Pakistan.

“There is a need to identify more biosphere reserves in Pakistan especially in the coastal areas. These areas help fight global climate change and also serve humanity in many ways,” he said, adding that the success of many UN Sustainable Development Goals depended on innovative approaches such as using unused saline barren land and salty water for non-conventional halophyte based agriculture.

“We can construct ‘floating mangrove forests’ in tropical oceans, which wouldn’t only help in sequestering rising carbon dioxide, but will also provide several community services such as feedstock for biofuel and fodder,” he explained.

According to him, many artificial islands are being constructed in the world and floating mangroves can be the source of primary productivity. “Successful demonstration of floating mangroves was done in Qatar in 2012. The demonstration site still exists there.”

He also proposed the idea of establishing a “world halophyte garden” to conserve the germ plasm of over 2,000 halophyte species found worldwide.

Prof S.M. Saqlain Naqvi, the Vice Chancellor of Bacha Khan University, Charsadda, presented his research paper on the use of bioengineering techniques for biofuel production.

Intensive use of fossil fuels, he noted, was the leading factor causing global climate change. “Therefore, the world is now looking for environment-friendly fuel options such as biofuel. Biofuels are produced mainly from plant biomass and are both renewable and nearly carbon-neutral. However, in order to avoid competition between food and biofuel crops, halophytes can be cultivated as fuel feedstock, which grow on barren saline land.

“Bioengineering techniques, more efficient enzymes and microbes could be designed to convert halophyte biomass into bioethanol and biodiesel in order to supplement fuel requirements of burgeoning population,” he observed.

Speaking on saline agriculture and its role in sustainable community, Umer Butt of Sindh Engro Coal Mining Company said that saline agriculture had a lot to offer in sustainable development of communities living in the Thar desert.

The company, he said, had collaborated with ISHU to utilise saline water obtained during coal mining for growing halophytic fodder in Thar. The project, he hoped, would help transform lives of poor communities that depended on livestock for their livelihood.

Dr Abdul Hameed Baloch from Lasbela University of Agriculture, Water and Marine Sciences discussed the use of geographic information system (GIS) techniques for studying halophyte diversity. “With this technology, we can efficiently map the vegetation and locate the various plant populations which are under threat. We can locate biodiversity hotspots with high precision,” he observed.

At the conference’s inaugural ceremony held on Monday, experts shared statistics, highlighting how serious the scarcity of fresh water is. Around 3.6bn people, almost half of world’s population, they said, lived in water-scarce conditions and more than 97 per cent of earth’s water was saline.

“About 11pc of the world’s irrigated areas are affected by salinisation. The continuous expansion of salt-affected land is highest in some of the most populated and economically challenged countries such as Bangladesh, India and Pakistan posing a serious threat to sustainable agricultural production,” director of ISHU Dr Bilquees Gul said.

Many desert halophytes, she said, performed important ecosystem services, acted as sand stabilisers and wind breaks. These species, when planted in brackish and saline soils near the edges, naturally help protect the site infrastructure from flooding, sandstorms, and erosion.

“Second, halophytes may provide opportunities for cultivation of fodder and energy crops using saltwater — even seawater — for irrigation. This is a hugely exciting prospect given the current and projected world shortages in fresh water, but remains a relatively unexplored research area,” she said. Dr Gul also briefed the audience about the institute’s work on halophytes and suggested that this work could contribute to rehabilitating saline land and providing fodder in arid areas in the country. *Published in Dawn, April 18th, 2018*

# The Express Tribune

Water Resources are depleting, We don't have enough for everyone

By News Desk

Published: April 18, 2018

As many as 3.6 billion people are living in water scarce conditions in the world which is almost half of today's global population.

This was stated by United Nations Educational, Scientific and Cultural Organisation (Unesco) Thailand's Science Adviser Dr Benno Boer at the inaugural ceremony of a four-day international conference, 'Sustainable Development: Halophytes for Green Revolution', organised by Karachi University's (KU) Institute of Sustainable Halophyte Utilization (ISHU).

United Nations (UN) has focused on this dangerous situation and suggested to utilise the currently unused salty water and barren saline lands, said Dr Boer, adding that there was a dire need to develop nature-based solutions for energy and food security.

"More than 97% of the earth's water is saline. The possibility of growing halophyte would be a great opportunity for the world," Dr Boer suggested, adding that so far halophyte biologists have been visionary and ahead of their time as they realised that scarcity of fresh water is real and they are working on solutions to ensure food security for the future.

He added that scientists must be good communicators so they may convince politicians and investors to support halophyte developments.

## **Pakistan dumps water worth \$22 billion into the sea every year**

"I am very happy to be in Karachi and have experienced great hospitality and the fantastic Pakistani culture and food," Dr Boer said.

He lauded KU Vice Chancellor Prof Dr Muhammd Ajmal Khan for his key role in developing a meaningful partnership between Unesco and KU.

He thanked ISHU Director Dr Bilquees Gul and termed her a true role model for women scientists of the country.

"Water resources are depleting and we don't have enough water for everyone. No institute in the world, except ISHU, has done such focused work in this subject," Dr Khan claimed.

He thanked Dr Attaur Rehman for providing support as the then Higher Education Commission chairperson to establish ISHU.

He advised young scientists to work hard and trust themselves. Marketing of scientific projects is very important to attract funding and investors, he said.

### **Pakistan's worsening water crisis**

Former chairperson of the Pakistan Science Foundation, Prof Dr Muhammad Ashraf believed research on saline agriculture and halophyte utilisation is the need of the time in the face of global climate change and salinisation of lands.

“High quality research and patents are developed at ISHU, making a pivotal contribution to global research literature,” he said.

Dr Gul said that about 11% of the world's irrigated areas are affected by salinisation. The continuous expansion of salt-affected land is highest in some of the most populated and economically challenged countries, such as Bangladesh, India and Pakistan, posing a serious threat to sustainable agricultural production, she said.

“Many desert halophytes perform important ecosystem services. These species, when planted in brackish and saline soils near the edges, will naturally help to protect the site infrastructure from flooding, sand storms, and erosion. Secondly, halophytes may provide opportunities for the cultivation of fodder and energy crops using saltwater for irrigation,” she said, adding that this was an exciting prospect given the current and projected world shortages in freshwater, but remains a relatively unexplored research area.

Halophytes provide options for livestock feeding in both semi-arid and saline landscapes. These plants vary in both biomass production and nutritive value. They are characterised by slow growth, low digestibility and high content of anti-nutritional factors.

### **Tube wells running dry: Water crisis in RCB and CCB reaching alarming levels**

“Some of the poorest places on the planet are ‘rich’ in deserts and are located near plentiful salt water resources, making them suitable candidates for halophyte farming,” she said. The economic benefits for poor countries are stable growth, lower unemployment, better balance-of-trade and less reliance on foreign food aid programmes, she shared. She added that Thar is the largest desert in Pakistan and the ninth largest in the world. With a tropical desert climate, rains play a vital role in the Thar region as underground water is rarely found. Utilising brackish water in Thar will reduce pressure on fertile lands and fresh water resources, she said.

“We have made significant progress in research on this subject and believe that if properly implemented, it could contribute significantly in rehabilitating saline land and providing fodder to arid areas like Thar. The communities along Tharparkar are extremely poor and the introduction of this grass could greatly uplift their economic conditions,” Dr Gul maintained.

## National Courier

### All Set for International Conference at KU

Apr 13, 2018

By Staff Reporter

KARACHI: The inaugural ceremony of 4-day international conference on Sustainable Development Halophytes for Green Revolution organized by Institute of Sustainable Halophyte Utilization (ISHU), University of Karachi(KU) will be held on Monday, 16th April, 2018 at (ISHU).

According to Director ISHU, Dr Bilquees Gul this conference aims to bring together leading academic scientists, researchers, UN organizations, public and private national and international organization, industries and policy makers to discuss in general the sustainable use of halophytes (i.e. naturally salinity tolerant plants of saline areas) and facilitate research to determine the efficacy of the ideas for halophytic green revolution to turn saline wastelands into a resource.

The ultimate goal is to transform currently barren saline lands into productive croplands, so that food security can be achieved in future. This kind of research will greatly benefit the poor farmers of the Pakistan and other countries, which suffer from land solemnization and drought.

Institute of Sustainable Halophyte Utilization (ISHU), University of Karachi is one of the leading institutes of the world for research on halophytes and saline agriculture. In recognition of achievements of ISHU in very short period of time (since its establishment in 2006), UNESCO established first ever ‘Chair in Sustainable Halophyte Utilization’ at ISHU in 2009 under UNITWIN Programme of UNESCO.

Despite small size and scarce funding, ISHU is trying its level best to play a pivotal role in sustainable utilization of halophytes and saline lands. This conference is also a contribution towards sustainable halophyte utilization for green revolution in the arid regions. Beside national participants, a number of renowned scientists from Germany, Thailand, Ethiopia and Tunisia will participate.

Alternative solutions

## 'Water resources are depleting, we don't have enough for everyone'

3.6 billion people are living in water scarce conditions in the world, says UNESCO adviser

### NEWS DESK

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water and barren saline lands, said Dr Boer, adding that there was a dire need to develop nature-based solutions for energy and food security.

"More than 9% of the earth's water is saline. The possibility of growing halophyte would be a great opportunity for the world," Dr Boer suggested, adding that so far halophyte biologists have been visionary and ahead of their time as they realised that scarcity of fresh water is real and they are working on solutions to ensure food security for the future. He added that scientists must be good communicators so they may convince politicians and investors to support halophyte developments.

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Unesco Thailand Science Adviser

Dr Benno Boer

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species, when planted in brackish and saline soils near the edges, will naturally help to protect the site infrastructure from flooding, sand storms, and erosion. Secondly, halophytes may provide opportunities for the cultivation of fodder and energy crops using saltwater for irrigation," she said, adding that this was an exciting prospect given the current and projected world shortages in freshwater, but remains a relatively unexplored research area.

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## دنیا کی آدھی آبادی پانی کی قلت کا شکار ہے، ڈاکٹر اجمل

عالمی کانفرنس سے ڈاکٹر بینو بوئر اور دیگر کا خطاب، ڈاکٹر بلقیس نے خطبہ استقبالیہ پیش کیا

کراچی (اسٹاف رپورٹر) یونیسکو تھائی لینڈ کے مشیر سائنس ڈاکٹر بینو بوئر نے کہا کہ دنیا میں 3.6 ارب افراد پانی کی کمی کا شکار ہیں، اقوام متحدہ نے اس عالمی مسئلے کا نوٹس لیتے ہوئے ممالک کو نمکین پانی اور بجز زمینوں کو قابل استعمال بنانے کا مشورہ دیا ہے، دنیا میں موجود 97 فیصد سے زائد پانی نمکین ہے، ہیملو فائٹس کی صورت میں اس عالمی بحران سے نمٹنا جاسکتا ہے، وہ جامعہ کراچی کے انسٹیٹیوٹ آف سسٹین ایبل ہیملو فائٹ یونیورسٹی کے زیر اہتمام 4 روزہ عالمی کانفرنس سے خطاب کر رہے تھے جس کا عنوان ”پائیدار ترقی، سبز انقلاب میں ہیملو فائٹس کا کردار“ تھا، جامعہ کراچی کے وائس چانسلر پروفیسر ڈاکٹر محمد اجمل خان نے صدارتی خطاب میں کہا کہ پانی کے وسائل کم ہوتے جا رہے ہیں اور اب دنیا کی آدھی آبادی پانی کی کمی کا شکار ہے، انہوں نے مزید کہا کہ سائنسی پروجیکٹس کی مارکیٹنگ انتہائی ضروری ہے تاکہ فنڈنگ اور سرمایہ کاری حاصل کی جاسکیں، کانفرنس سے سابق چیئرمین پاکستان سائنس فاؤنڈیشن پروفیسر ڈاکٹر محمد اشرف نے بھی خطاب کیا، جامعہ کراچی کے انسٹیٹیوٹ آف سسٹین ایبل ہیملو فائٹ یونیورسٹی کی ڈائریکٹر پروفیسر ڈاکٹر بلقیس گل نے خطبہ استقبالیہ پیش کرتے ہوئے کہا کہ دنیا بھر کی قابل کاشت زمینوں میں سے تقریباً 11 فیصد شور زدہ ہیں جن میں سے اکثریت ترقی پذیر ممالک جن میں بھارت، بنگلہ دیش اور پاکستان شامل ہیں، ان ممالک کی زرعی پیداوار اس مسئلے کی وجہ سے شدید خطرات میں ہے، دنیا کے غریب ترین علاقے صحرا سے مالامال ہیں اور نمکین پانی کے وسائل کے قریب واقع ہیں جہاں ہیملو فائٹس فارمنگ کیلئے سازگار حالات موجود ہیں۔