



PAKISTAN BIOTECHNOLOGY INFORMATION CENTER



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NATIONAL NEWS

Mutual Research on Food Security, Other Areas: Sindh Agricultural University, Hamdard University Sign MoU

During the ceremony, Vice Chancellors of Sindh Agricultural University and Hamdard University Karachi and senior officials of both universities participated. Syed Shabib ul Hasan Vice Chancellor Hamdard University signed the agreement, during simple ceremony held at senate hall Sindh Agricultural University. According to the MoU, both universities will organize joint research and collaboration, symposia, seminars, workshops, joint meetings, and conferences in the form of lectures and joint outreach activities in agriculture and related fields, while researching the most innovative ideas, solutions, and will exchange of data and information through technical and scientific

publications. Fateh Marri said that the agriculture sector plays an important role in the need for many commodities, medicines, and other products, there is scope for more research and discovery in agriculture, and in this regard, SAU and HU will further promote the research of plants required for medicinal, oil and cosmetic industries, especially in Thar, Kohistan, Kachho and other arid areas of Sindh.

Syed Shabib ul Hasan, Vice Chancellor HU said that Hakeem Muhammad Saeed founded Hamdard University in 1991, and now Hamdard University has emerged as one of the top institutions of higher education and learning in Pakistan.

Original Link: <https://www.brecorder.com/news/40220330/joint-research-on-food-security-other-areas-sau-hu-sign-mou>

INTERNATIONAL NEWS

Crop Zoning to Increase Potency of Agriculture Sector in Pakistan

ISLAMABAD - The crop zoning in Pakistan can increase the yield of different crops in order to meet the requirements of rapidly growing population and enhance the contribution of the agriculture sector towards gross domestic product, reported by Wealth PK reported. He said that the country is divided into provinces and zones so crop zoning is crucial to enhance the contribution of the agriculture sector to GDP. The agriculture industry provides tremendous opportunities for rapid economic expansion.

“There is a need for agroecological zones to be established in Punjab in order to devise policies and strategies for using natural resources in a sustainable and diversified manner to improve the productivity of agriculture. “

Original Link: <https://www.nation.com.pk/14-Jan-2023/crop-zoning-to-increase-productivity-of-agriculture-sector-in-pakistan>

The Food Agriculture Organization (FAO) Assured Pakistan for Support in Agriculture

ISLAMABAD: The Food and Agriculture Organization (FAO) of the United Nations has assured Pakistan that it will continue to play a leading role in transforming the country's agriculture food systems to make them more efficient, inclusive,

sustainable and resilient. This is a challenge that has gained urgency following recent floods that have devastated the country's agriculture sector.

To date, the FAO has mobilized over \$25 million and has provided over 600,000 affected people with seeds

and fertilizers. The FAO's role in Pakistan includes the provision of technical leadership for the Transforming Indus Basin Initiative, funded by Green Climate Fund. Through this programme, some 1.3 million people in vulnerable areas of the Indus River basin will see improved yields and increased returns of between 30 and 80 per cent in their

production. The project will help shift Pakistan and its Indus Basin agriculture from the current situation of high vulnerability toward an alternative paradigm in which better information, water management and farming practices will significantly increase resilience to climate change.

Original Link: <https://www.dawn.com/news/1731046>

Renewed Collaboration, Public Private Partnership to Enhance Agriculture Production

ISLAMABAD - Pakistan Hi Tech Hybrid Seed Association Chairman Shahzad Ali Malik Sunday stressed the urgent need for renewed collaboration and public private partnership to boost agriculture production to offset the ever increasing impending threat of food insecurity in the world. He said the prime objective of public private partnership is to use market mechanism to improve Agri food systems, thereby reducing food insecurity and advancing rural development. He said Pakistan's

export make up more than 8 percent of world's total rice trade. He said, "Guard Agricultural Research Division is the pioneer in developing extra long grain varieties in Pakistan" and established 5 research stations all over the country in rice growing areas one each at Golarchi, Larkana, Muridkey, Pakpattan and Lahore for conducting the latest research in evolving new varieties braving heat resistance, drought and salinity tolerance.

Original Link: <https://www.nation.com.pk/16-Jan-2023/renewed-collaboration-public-private-partnership-to-boost-agriculture-production>

HEALTH BIOTECH NEWS

Only Fortified Crops Offer Sustainable Food Safety, Better Nutrition in Pakistan: experts

Amid fears of considerable decline in the wheat production due to effects of climate change for the 2022-2023 season, biofortified crops, especially Zinc-enriched wheat, has the potential to help bring food security to Pakistan and overcome widespread and preventable zinc deficiency in the larger population, food and agriculture experts said on Saturday. Pakistan faces serious challenges of food insecurity and malnutrition, especially among women and children. The warming climate is a direct nutritional and economic threat to billions of smallholder farmers in Pakistan who rely on staple food crops for much of their diet and income. "Pakistan is leading the way globally when it comes to scaling zinc wheat production," said Jenny Walton, Harvest Plus Head of Commercialization and Scaling, following a recent visit to Pakistan during

which she inaugurated zinc wheat flour production at a chakki mill in Faisalabad.

"Zinc wheat has commercial benefit for all supply chain players and results in a nutritious product that consumers need and want," she added. The owner of a chakki mill in Faisalabad, Mahboob Ahmed, echoed this sentiment, "At my mill there is a no difference in the price of the whole grain wheat flour made from zinc-enriched varieties compared to conventional wheat varieties. My income has increased as more people are coming to my shop to buy zinc wheat flour". He added, "I am thankful to Harvest Plus for building my capacity to supply people of my area with zinc wheat flour, which is good for their health and supports their immunity against diseases".

“There is need to keep the momentum going for the production of zinc wheat varieties so that micronutrient deficiencies of a sizeable population can be overcome,” he said. “Crops may lose 8-10 per cent of yield with rising temperatures,” said Munawar Hussain, an advisor to Harvest Plus in Pakistan. Wheat is consumed by 98 per cent of the population of Pakistan daily. Hussain suggests the country will have to adopt rust resistant and heat and drought tolerant varieties of wheat to meet the growing food demands of the country.

Specifically, Hussain recommends the cultivation of biofortified zinc wheat to address zinc deficiency among the people of Pakistan. “Research institutions in Pakistan have developed rust-resistant varieties of wheat that are also helpful in overcoming

micronutrient deficiencies as they are zinc biofortified. There is a need to continue creating awareness among our wheat growers and farmers to switch to the biofortified zinc wheat varieties that better withstand the effects of climate change and provide better nutrition to our people,” said Hussain. The Government of Pakistan’s Ministry of National Health Services, Regulations and Coordination believe adoption of zinc wheat is imperative to public health.

“Providing added zinc to the population by growing indigenously developed zinc wheat varieties is an easy, cost-effective, and sustainable strategy to address zinc deficiency.”

Original Link: <https://www.thenews.com.pk/print/1030747-only-fortified-crops-offer-sustainable-food-security-better-nutrition-in-pakistan-experts>

Water Resource Management to get Special Attention under CPEC

Pakistan has suggested water resource management and climate change as potential areas of collaboration within the scope of the China Pakistan Economic Corridor long-term strategy, reports Wealth PK. When it comes to water resources, Pakistan ranks among the least developed nations in the world. In Pakistan, Indus River is a source of more than 17 giga watts of hydropower, and it also provides water to the Indus basin irrigation system, the world’s biggest contiguous irrigation network. More than 90% of Pakistan’s agricultural output is derived from the Indus Basin, making Pakistan particularly reliant on it, according to Scientific Reports, 2022.

He said Pakistan has a great opportunity to address the problem of water resource management through

CPEC.” “By 2025, Pakistan is expected to be a water-scarce country. The acute challenge of water resource shortages is impeding the sustainable growth of agriculture in Pakistan. Dr. Islam said that altering the crop planting patterns will help the region’s water resources, lower the percentage of the population that is malnourished, and support water-saving irrigation techniques and water delivery systems in Pakistan.

“Enhanced communications between China and Pakistan in the areas of agriculture, industrial technology, and other areas would gradually increase regional water and grain security.”

Original Link: <https://dailytimes.com.pk/1051531/water-resource-management-to-get-special-focus-under-cpec/>

Agricultural Emergency should be declared to Deal with Food Disaster’

LAHORE: Pakistan Kissan Ittehad on Wednesday demanded of the government to declare agriculture emergency to deal with the prevalent food disaster in the country.

“It is pity that farmers are forced to run from pillar to post to get urea fertilizer on exorbitant rate of Rs 3,000/bag and similar is with the case of common man who is facing humiliation in his bid to get a loaf for his family.” Khalid Khokhar, President PKI told a news conference. Khokhar said a wheat support price

was announced by Sindh at Rs 4,000/maund, but no price was announced in Punjab and KPK.

“Farmers did not maximise sowing area under wheat since they did not know the support price and Punjab government must immediately announce Rs 4,000 per maund as wheat support price to stop smuggling of wheat,” he added.

Khokhar said wheat crop sown in November is now looking weak due to lack of fertilizer input. Khokhar

said the government has shut down two urea factories in January.

“This is the time for urea application on wheat. With severe shortage of urea today, wheat crop will suffer further,” he said.

Urea is being black marketed at Rs 3,000 per bag versus MRP of Rs 2,440. Also, it is not available for farmers. Khokhar said the government must immediately re-start all urea factories to ensure supply of urea for wheat crop.

Original Link: <https://www.thenews.com.pk/print/1029622-agricultural-emergency-should-be-declared-to-deal-with-food-crises>

More than 100 Tons of Golden Rice Harvested in the Philippines

The Department of Agriculture [Philippine](#) Rice Research Institute (PhilRice) has announced that more than 100 tons of fresh paddy of beta carotene-enriched Malusog Rice ([Golden Rice](#)) have been harvested in 17 pioneer production sites across the country.

This first harvest will be milled for distribution in target households in selected provinces in the country with preschool children at-risk for vitamin A deficiency (VAD) and undernutrition, as well as pregnant and lactating mothers. VAD leads to poor eyesight and weak immune systems, making children prone to viral infections and other diseases and delaying growth and development. The municipalities of Viga and Virac in the province of Catanduanes had already received promotional packs of Malusog Rice as part of the initial household distribution. Catanduanes is one of the seven pilot provinces to receive the beta carotene-enriched variety as it has one of the highest incidences of

malnutrition in the country, according to the Expanded National Nutrition Survey conducted by the Department of Science and Technology – Food and Nutrition Research Institute.

The governor of [Antique province](#), Rhodora Cadiao, said that Malusog Rice could be one of the ways to address the province's VAD problem among preschool and school children. Farmer-cooperators also showed their support and delight as the first to plant and harvest Malusog Rice in their respective provinces. “As I have observed, Golden Rice has good quality seeds, and I want to taste it already. It also has good characteristics in terms of its elongated stem. I was encouraged to be a cooperator of GR to help the government minimize cases of malnutrition,” said Leo Franco Ebarido, a seed grower in Bayugan City in the province of Agusan del Sur.

Malusog Rice (Golden Rice) is branded after its first variety registered in the National Seed Industry Council as Malusog 1 or NSIC 2022 Rc 682GR2E.

For more details, read the article on the [PhilRice website](#).

OTHER THAN CROP BIOTECH NEWS

Arguable Stresses Need to Fix Economy

The panelists were Marwa Khan, Saleem Raza, Ehtesham Rabbani, Liqat Javeed, and Dr. Mubashar Munwar Khan while moderated by

Sikindar Lodhi. Marwa Khan said, “99 percent of our issue is distrust. Unfortunately, foreigners are unwilling to give aid to the government and want to

distribute through NGOs. There is a need to ensure that the aid should reach the affected people.” Saleem Raza said that before 65 war American investments in Pakistan’s agriculture, education and other sectors was huge.

Money has now become base of the politics in Pakistan. In the past many politicians were not allowed to complete their elected term, so we should work on long-term policies. Agriculture sector can play an important role in improving the country's economy and can also reduce the current food security challenge, he said. Removing the label of corruption from Pakistan both locally and globally is important, alongside the state has to restore its trust in which all state institutions falls.

Liqat Javeed said gap created between government and people and public is suffering from depression. Public deprivations are increasing. The

government should give trust to the farmers that the government is with them; attention should be given to the agricultural sector. Dr. Mubashar Munwar Khan said that developed countries were responsible for climate change affects but it was not necessary for Pakistan to live on foreign aid.

Many countries witnessed the calamities from which Pakistan passing through but they never depend on foreign aid. Politicians' disagreements put national interests at stake. The default statements created problems with global implications while foreign aid pledges will reduce default pressure. However, Charter of Economy, along with long-term policies is the solution of the political and economic instability.

Foreign aid cannot solve our domestic problems, so foreign investment is necessary, he said.

Original Link: <https://www.thenews.com.pk/print/1029664-moot-stresses-need-to-fix-economy>

Supply Chain Require Critical Improvement for Pakistan’s Agriculture Sector

Lack of access to healthy food means 12 percent of the population is malnourished and 38 percent of the children under 5 are stunted. First of all, imperfect crop production practices result in low-quality products in the first place which are often affected by disease or other irregularities, lowering the shelf life. After that, the majority of farmers still lack the necessary tools and training to carry out the harvesting. The indigenous agri-engineering industry is entirely nonexistent, and neither farmers nor the state can’t possibly afford the imported harvesting tools on a mass scale.

The farmers’ storage practices are old and inefficient while the cold storages are expensive as well, in addition to being old and inefficient. The Competition Commission of Pakistan had also urged the State Bank of Pakistan SBP to ease the financing for storage facilities. The transport of commodities from the farm gate to the markets is done on carriers that have never been food-grade certified in their lifespan. Easy fresh is a B2b startup linking farmers with retailers across the country and ultimately increasing efficiency by eliminating the stakes of the

middleman.

Mustafa argued that farmers are forced to buy poor quality seeds due to the lack of financial resources while the fertilizer and irrigation practices are also the least efficient. Talking about processing and value addition, he highlighted the lack of domestic demand for processed food as the primal cause of lower investor interest in the sector. He also pointed out the higher domestic production costs which render locally processed food costlier than even imported items. The production technologies of all cereal and crops need to be optimized to raise quality and increase the shelf life.

The food processing industry is not developing at the desired pace as it’s a risky business with a hard-to-capture market while the investors can see tons of other problems to solve and better investment opportunities to capture. SBP needs to lay out the financing for the startups through private banks to develop the food processing industry. Government involvement is also necessary to protect the companies from market-wide observed adulteration

in food commodities and take severe criminal actions against actors involved in playing with people's health. It's a much-needed measure to incentivize the private sector to venture into this market as the government should act as an enabler in the end, the improvements will come when dozens of companies would be in healthy competition to process agricultural commodities but the people involved in adulteration and selling out-dated and lower quality produce easily undercuts the competitors who play by the rules as everyone knows that our legal system has got better things to do than jailing culprits selling anything in the name of food.

According to World Bank Data, Pakistan's per capita income is only next to Afghanistan and Nepal while the production, sorting, and marketing of both

processed and raw commodities with higher quality is likely to increase the end price and that's where masses in Pakistan are either reluctant or are completely unable to step in and pay extra money for that higher quality. In addition to the higher input costs, no effective regulatory mechanisms in place, and multiple middlemen between farmer and consumer, this is another major reason for both the higher market prices and vegetable and fruit wastage. Although the local dealers and agents keep track of the area-wise demand to manage supply accordingly but that whole process is not even remotely efficient enough to handle our current market size.

Original Link: <https://propakistani.pk/2023/01/11/supply-chain-reforms-critical-for-pakistans-agriculture-sector/>

PLANT BREEDING INNOVATIONS

Single Guide RNA for CRISPR-Cas9 System Based on Rice Bacterial Blight Resistance Gene

A team of researchers from the University of Jember, Indonesia, successfully developed a single guide RNA for CRISPR-Cas9 system based on the *xa13* resistance gene of rice. The research article is published in the *Journal of Tropical Plant Pests and Diseases*.

Xa13 is a recessive resistance gene against rice bacterial blight pathogen *Xanthomonas oryzae* pv. *oryzae* (Xoo) found in several rice varieties. As this gene is activated, the production of sucrose for Xoo growth is also turned on. Thus, the

researchers aimed to design and construct the gRNA-targeting *xa13* in rice using bioinformatics tools. They selected two candidates of gRNA-targeted *xa13* based on the bioinformatics data. The gRNA1 will target exon 1 and the gRNA2 will target exon 2, with an efficiency of 52.51% and 44.63%, respectively. The findings showed that the guanine-cytosine content of all gRNA candidates ranged from 55 to 70%, with no off target location in the whole genome of rice. A series of tests confirmed the successful construction of the design.

For more findings, check out the [Journal of Tropical Plant Pests](#).

Rice Breeding Breakthrough Could Help Feed Billions

An international research team has successfully propagated a commercial hybrid [rice](#) variety as a clone through seeds with 95 percent efficiency. According to the team, this could lower the cost of hybrid rice seeds and make high-yielding, disease

resistant rice varieties available to low-income [farmers](#) worldwide.

Rice, the staple crop for half of the global population, is costly to breed as a hybrid for a yield improvement of about 10 percent. One of the solutions to this

would be to propagate hybrids as clones that would remain identical from generation to generation without further breeding. Many wild plants can produce seeds that are clones of themselves, a process called apomixis. However, transferring apomixis to a major crop plant has proved difficult to achieve. In 2019, a team at the University of California Davis (UC Davis) led by Professor Venkatesan Sundaresan and Assistant Professor Imtiyaz Khanday achieved apomixis in rice plants, with about 30 percent of seeds being clones. Sundaresan, Khanday, and colleagues in France, Germany, and Ghana have now achieved a clonal efficiency of 95 percent, using a commercial hybrid

rice variety. The team also showed that the process could be sustained for at least three generations.

The single-step process modifies three [genes](#) called MiMe, which cause the plant to switch from meiosis to mitosis. Another gene modification induces apomixis, and resulting in a seed that grows into a plant genetically identical to its parent. “Apomixis in crop plants has been the target of worldwide research for over 30 years, because it can make hybrid seed production accessible to everyone,” Sundaresan said. He also noted that the increase in yields can help meet the global needs of an increasing population without having to increase land, water, and fertilizer use.

For more details, read the article on the [UC Davis website](#)