GLOBAL FORUM FOR INNOVATIONS IN AGRICULTURE
The world population is growing daily and the planet’s resources are diminishing at a faster rate. On 9-11 March 2015, agricultural innovators, investors, scientists and researchers came together in Abu Dhabi to showcase some of the game-changing innovations driving the future of global agriculture and changing the way we feed the world. GFIA is one of the most significant meetings committed to challenging the way that food is produced. In this event report, *International Innovation* offers a summary of this year’s highlights.

**Innovation in Agriculture**

offers the only real chance of being able to produce the 56 per cent more food required by 2050 to feed the predicted population of 9 billion. The recent Global Forum for Innovations in Agriculture (GFIA) saw 4,552 attendees from 85 countries come together with 23 ministerial delegations to showcase innovations for sustainable agriculture, exchange ideas from around the world and meet potential collaborators.

Under the patronage of His Highness Sheikh Mansour Bin Zayed Al Nahyan, Deputy Prime Minister of the United Arab Emirates, Minister of Presidential Affairs and Chairman of Abu Dhabi’s Food Control Authority, the second edition of GFIA was declared open by His Excellency Dr Rashid Ahmed Mohammed Bin Fahad, Minister of Environment and Water of the UAE. The opening ceremony included a large number of high-profile world leaders in sustainable agriculture, climate, policy and food security. Of particular note were talks by HRH King George Rukidi IV of Toro, Uganda; HRH The Prince of Wales; John Kerry, US Secretary of State; Dr Ren Wang, Assistant Director General of the Food and Agriculture Organization of the United Nations (FAO); and Dr Naoko Ishii, CEO and Chairperson of the Global Environment Facility.

**John Kerry, US Secretary of State**

“Today, there is no greater challenge than feeding the world’s growing population. Across the globe, over 800 million people are going hungry because they don’t have access to nutritious food, and the numbers will only grow as we reach 9 billion people on the face of this planet during this century. If we want to ensure that this crisis doesn’t grow worse, we need to find a way to grow far more food and waste much less. […] We can’t guarantee food security unless we curb the harmful impacts of climate change. These impacts are visible everywhere that we look. In Somalia, farmers till cracked earth that has been untouched by rain for many months; in India, families can only watch in anguish as unseasonal monsoons wash away young crops; in Central America, unusual weather quietly spreads devastating plant pathogens; and in North America, blistering wild fires roar through our mountains and forests. From the Caribbean to the coasts of Africa, whole communities are threatened by dwindling fish stocks and rising sea levels. If we are to solve this growing food crisis, we have to address head on the direct connection between climate change and food security. That’s why we launched the Global Alliance for Climate Smart Agriculture (GACSA) at the UN last September. GACSA is an important platform for bringing together scientists, farmers, business people and governments, encouraging them to contribute the best ideas and raising awareness of the urgent need for action. [...] Climate change will actually affect every single one of us one way or another, so I encourage each and every one of you to think hard about what you can do to improve the lives of the most vulnerable amongst us. We really need you to take action at home, to seek partners, which is exactly what we’re doing in the US. We need you to create new drought-resistant seeds, develop irrigation techniques that maximise our limited water resources, train local farmers in sustainable and resilient practices, and rehabilitate degraded land in order to spare forests. We need you to tell your leaders that an ambitious, durable and inclusive global agreement on climate change is essential to our shared future, and we have a chance to get that agreement in Paris this December. I couldn’t be more pleased that so many people from so many countries, and frankly, from all walks of life, are committed to meeting our food security needs. With the right focus, the right attitude and the right collaborative spirit, we can create a sustainable world, where no one goes to bed hungry and no one wakes up without knowing where their next meal can be found. That is absolutely not an unreachable dream, it is a reality that remains potential if we make the choices that we need to make. I hope everybody will join in this effort. We have met these challenges before and I assure you that we can meet them again.”
One of the most remarkable achievements of our age is the way food production has increased at a pace that has just about matched the explosive growth of the global population. It has been suggested that any rapid rise in the human population would eventually be curtailed as a result of reaching limits of agriculture, which would precipitate food shortages and famines. Fortunately, this hasn’t happened yet. I say this because, before we prematurely pat ourselves on the back for this apparent success, we should surely pause for a moment and remember that, in addition to one in eight of the people in the world still being malnourished, virtually the same number are obese, and some forms of agricultural innovation have had very undesirable side effects. For instance, in the most developed farming regions, the pace of yield growth has slowed or plateaued due to declining soil fertility, so it may be becoming harder and harder to sustain our successes. Furthermore, our success in increasing agricultural output has come with another very hefty price tag; namely, the depletion of natural capital from what I can only refer to as nature’s bank.

Evermore intensive farming has led to widespread soil damage and diminished soil fertility, as a result of which, crops are more susceptible to disease and yields are falling. These problems of the degradation of the ecological systems that make farming possible are well illustrated by the situation in Punjab, where the so-called Green Revolution has precipitated an environmental and nutritional crisis. Then, there is the depletion of fresh water, a trend that I note with some trepidation was identified this year by the World Economic Forum as the biggest societal and economic risk facing the world during the next 10 years, not least because of its impact on food security.

I remember pointing out in a lecture on global security, more than 20 years ago now, that the rise and fall of entire civilisations could be correlated with changes in the water available to them. Nearly half the world’s land is situated within international water basins that are used by two or more countries so, as demand for this most precious of all natural resources increases, so too does the potential for conflict, yet we are now using even greater amounts of water, including from sources that can never be replenished. I believe this means that improving the sustainability of our future food systems must go hand in hand with reduced water use which, in turn, can best be achieved by increasing soil organic matter as well as so-called smart irrigation. Of course, climate change will exacerbate many of these problems through the impact of extreme storms, changing rainfall and temperature patterns on food production, and it should be remembered that farming itself is a huge contributor to carbon dioxide and other greenhouse gas emissions.

To these concerns, I’m afraid we also need to add the worldwide decline of biodiversity and, in particular, pollinating insects and the consequent implications for the two-thirds of crop plants that rely on them. Although I have no doubt that while technological innovation can help us address at least some of these problems, it does seem to me that the way we introduce such technologies needs to be underpinned by a properly integrated and holistic perspective. For example, we need to look much more carefully at the underlying natural systems that enable agriculture to function, including the forests and wetlands that play such vital roles in the water cycle. We need this more integrated thinking because otherwise, I fear, we will go on overlooking the interconnections between food, energy, water and physical security with all the accumulating dangers that it entails.

Finally, ladies and gentlemen, it shouldn’t be forgotten that there is a human dimension to all of this. The right kind of innovation in agriculture will, of course, continue to be essential, but there are important questions about the way in which it is employed and the impact on rural people and their livelihoods. I happen to believe that small-scale local food producers are usually the best custodians of the land and its productive potential. In many cases, they have provided not only local food security over many generations, but also wider prosperity for entire regions. There is plenty of evidence that technical innovation is often most successful when those responsible listen carefully to farmers, taking seriously their hard-earned knowledge about local sustainability and respecting the ongoing indigenous innovation and experimentation that is continuously happening in their communities. Working this way, we can develop appropriate technology that empowers rural communities and works to support rather than supplant ecological processes.
THE INNOVATION HIGHLIGHTS

INNOVATION: SALT FARM TEXEL, NETHERLANDS
Salt Farm Texel is a company where science, agronomy and the business sector come together. It is specialised in evaluating the salt tolerance of conventional crops and halophytes, large-scale screening of possible salt tolerant cultivars, and developing saline agricultural practices. By facilitating the development and introduction of saline crops, Salt Farm Texel wants to contribute to the progress of saline agriculture as a working concept. With over 1 billion hectares of salinised soil worldwide, and rising, the potential is enormous. By cultivating saline crops, saline soils can be seen as an opportunity to increase agricultural production.

At the research location of Salt Farm Texel, a salt tolerant variety of potato has been identified. After screening about 50 strains at six different salt concentrations under field conditions, this variety showed a salt tolerance level that is about four times higher than previously believed to be possible. Now, Salt Farm Texel wants to start cultivation in various areas affected by salinity. Additional research on other salt tolerant varieties, effective fertilisers, the publication of the research data, and realising new test facilities in other climate zones are potential activities for the nearby future. By developing saline agriculture as a serious alternative, farmers, who are faced with salinisation, can (re-)use saline soils and continue cultivating crops for the growing world population.

INNOVATION: PROTIX BIOSYSTEMS, NETHERLANDS
Recovery of valuable nutrients like proteins and lipids from organic waste by using nature’s most powerful creatures: insects. Insects are a formidable force of nature. They are primal, natural and can offer a high-quality source of ingredients for fish and animal feeds. They play a pivotal role in the nutrient cycle by converting low-quality degrading material into high-quality living biomass.

Protix takes the logical step in facilitating nature to play a pivotal role in our food chain. It has developed large-scale production technologies and principles that enable the extraction of high-quality proteins and lipids from organic waste. This makes Protix the first company worldwide to cultivate insects efficiently, guaranteeing the highest standards of controllability and safety. Protix believes in a future in which the preservation of nutrients is key to providing a safe and secure supply of food. With the development of this accessible technology, Protix has ensured organic waste as the new source of feed for our future generations.

INNOVATION: PLANET LABS, UK
Satellite imaging has revolutionised our knowledge of Earth, with detailed images of nearly every street corner readily available online. But Planet Labs says we can do better and go faster – by getting smaller. It produces tiny satellites – no bigger than 10x10x30 cm – that, when launched in a cluster, provide high-res images of the entire planet, updated daily.

Planet Labs creates commercial and humanitarian value with the market’s most capable global imaging network. Fresh data from any place on Earth are foundational to solving commercial, environmental and humanitarian challenges. Its global sensing and analytics platform unlocks the ability to understand and respond to change at a local and global scale.