

THE NEXT CATALYST FOR AGRICULTURE: SMART FARMING

AGRICULTURAL AND FOOD ENGINEERING TECHNICAL DIVISION

reported by



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On 21 November, 2018, the Agricultural & Food Engineering Technical Division (AFETD) organised a technical talk titled "The Next Catalyst for Agriculture: Smart Farming" by Ir. Dr Tan Chee Fai, who has over 18 years' experience in the manufacturing industry.

The world is moving at a fast pace. According to the Food & Agriculture Organisation (FAO) of the United Nations, world population will reach 10 billion in 2050. Of this number, 2/3 will be living in urban areas, so the demand for food will grow drastically. This will be made worse with the increased competition for natural resources, deforestation and land degradation. Climate change will jeopardise crop and livestock production, fish stock and fisheries. The report also said that some 700 million people living in rural areas today are still extremely poor. There are 2 billion people who suffer from micronutrient deficiencies and 800 million who are chronically hungry. Globally, about one-third of all food produced is lost or wasted, resulting in losses for farmers and unnecessary pressures on natural resources.

The world needs to improve agriculture productivity sustainably to meet demand, to ensure a sustainable natural resource base and to address climate change. In addition, we also need to eradicate extreme poverty and reduce inequality.

The food systems need to be more efficient, inclusive and resilient. The concept of agriculture has also grown. A decade or two ago, it was associated solely with the production of basic crops but today, agriculture includes forestry, bee-keeping, fruit cultivation, poultry and even dairy farming. Webster's Dictionary defines agriculture as "the art or science of production of crops and livestock on farms".

Agriculture has seen many revolutions, whether it's the domestication of animals and plants thousands of years ago, the systematic use of crop rotations and other improvements in farming practice a few centuries ago or the "green revolution" with systematic breeding and the widespread use of man-made fertilisers and pesticides a few decades ago.

Today, the 4th Industrial Revolution (4IR) means technological advancement with higher productivity and higher competitive approaches. To overcome the current issues in agriculture, the 4IR can be adopted. Agriculture is undergoing its own revolution, triggered by the exponentially increasing use of Information and Communication Technology (ICT).

Autonomous, robotic vehicles are being developed for farming purposes such as weeding, applying fertilisers or harvesting fruit. The development of unmanned aerial vehicles with autonomous flight control, together with the development of lightweight and powerful hyper spectral snapshot cameras can be used to calculate biomass development and fertilisation status of crops.

Smart farming can be the solution to the global food and economy problems. Smart farming can maximise agriculture yields while using minimum resources such as water, fertiliser, seed, etc. It is able to deliver high quality crop production with cost effective methods. Besides, smart farming technology may also be able to overcome problems caused by climate change. ■



Introduction by session chairman Ir. Ooi Ho Seng