

## Challenges of Food and Agriculture in the 21<sup>st</sup> Century

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### Editorial

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### Editorial

World population is projected to grow from some 7.3 billion today to almost 9.8 billion by 2050, with most of that increase coming in the developing regions. Feeding the human population will require at least a 30 percent increase in the production of food and other agricultural products between now and mid-century. Meanwhile increasing urbanization and rising affluence have generated a nutrition transition in developing and emerging countries leading to a growing awareness in the importance of organic and healthy food consumptions. These admittedly have implications for food and agriculture systems as they need to adapt significantly to become more productive and diversified with scantier resources and inputs. Producing more and better with less while at the same time coping with unprecedented climate changes and resource constraints and enhancing the livelihoods of farmers is indeed an overarching challenge.

The 20<sup>th</sup> century agriculture will be remembered for its high crop yield increases, made largely possible with high investment cutting edge technology which relies heavily on use of nonrenewable resources. Despite that quantum leap in the sphere of food and agriculture, approximately a billion people are still today chronically malnourished while intensive agricultural systems adopted are concurrently degrading land, water, biodiversity and climate on a global scale. Agriculture in the 21<sup>st</sup> century will have to respond to challenges of a different kind, and one of them facing the world population is to achieve the Sustainable Development Goals (SDGs) of eradicating hunger and poverty while ensuring continued sustainability of agricultural and food systems. However, to meet the world's future food security needs, it is equally imperative to ensure that food

and agriculture remains central to strategies that address other SDGs such as integrated pest and disease management in cropping systems, exploiting the potential of food products as phytomedicines, and the use of biotechnological tools to breed for high yielding varieties, to name a few.

Indeed, a new paradigm of inclusive agriculture green growth is required that will foster more efficient farming systems, reinforce cross-sector coalitions, transform the food and agriculture financial structure, and advance the frontiers of research and farmer education. Attainment of that new paradigm in the 21<sup>st</sup> century requires a mobilization of new research and education.

Agriculture, food security, health and nutrition are all fundamentally linked. With increased urbanization and changes in lifestyles, nutrition transition has led to rapid rises in obesity and chronic diseases even among the poorer nations. This has prompted a new wave of research which encompasses not only agriculture and food processes but also the health aspect. Latest research in food technology and nutrition has seen the birth of functional foods such as anti-oxidant rich foods, probiotics and soy proteins among many others. Current research has already unraveled that antioxidants obtained from fruits, vegetables and whole grains are potentially effective in disease risk reduction and can thus be beneficial to human health.

Another great challenge for food security in the 21<sup>st</sup> century is to improve yield stability through the development of disease resistant crops. As mentioned by many eminent scientists, increasing human populations, loss of agricultural land due to climate change, erosion,

and lack of water necessitate that we reduce as much as possible production losses such as those caused by pathogens. Even though significant strides have been made in the fields of genomics and mass sequencing, these techniques remain largely unknown or unaffordable to developing countries which still rely heavily on traditional means of managing pest and diseases in their crops. In this context during the past years research has considerably allowed a revamping of biological control in cash crops with the utilization of novel methods such as plant growth promoting fungi and plant growth promoting rhizobacteria possessing the additional virtue of disease suppression in pathogen infested soils.

This issue provides to the scientists and readers at large an overview of the state of the art research being conducted on food and agriculture systems in both developed and emerging states. By doing so, the international teams of authors are paving the way towards a well-informed policy making, planning and implementation concerning the development of sustainable and resilient agriculture and food systems.

I encourage food and agriculture scientists, in particular the younger generation, to make their research known by supporting this journal through submission of their articles.

