In this issue

Richard Strange¹

Published online: 14 January 2016

© Springer Science+Business Media Dordrecht and International Society for Plant Pathology 2016

This issue of Food Security has a special section with the title ‘Plant health and food security, linking economics, policy and industry’ resulting from an OECD meeting held in the autumn of 2014 at York, England. The section consists of 11 papers, the first an introduction by Alan MacLeod, which summarizes the 10 subsequent papers. After the special section there are a further 11 original papers on a range of subjects, two reports of conferences and two book reviews.

Christophe Béné and co-authors examine the concept of resilience and its practical applications in the context of food security and nutrition. They point out that its main value lies in its integrative property, facilitating greater collaboration among communities and among issues of concern in the developing world, which are normally disparate. However, for a concept to be useful, it requires metrics and the authors point out the challenges in finding appropriate ones, which would allow, for example, the resilience of development programmes to be measured.

The next two papers are concerned with a food source, which at present is only appreciated in limited areas of the world – insects! Laura Riggi and co-authors point out that some insects are nutritionally rich and are traditionally consumed in many regions of the globe. They studied insect consumption (entomophagy) in Benin and found that 29 arthropod species were eaten. Taking account of the high incidence of malnutrition among young children in that country, they suggest that the tradition of insect

collection should be encouraged and that selected species should be reared in captivity.

Lloyd Baieyegunhi and co-workers made a study of the role of the Mopane worm (*Imbrasia belina*) in the food security of rural household in the Limpopo Province of South Africa. In this area only 16 % of the population are food secure and 52 % are severely food insecure according to results obtained from application of the Household Food Insecurity Access Scale (HFIAS). As consumption and trade of the Mopane worm are significant factors influencing household food security, it will be important to maintain its woodland habitat in order to sustain the production of this valuable food source.

Greg Husak and Kathryn Grace used remote sensing to examine the characteristics and constraints of agriculture production in nine of the poorest and most food insecure countries of the developing world. They found that the very high resolution (VHR) technique used was effective in estimating cultivated areas in most country contexts and that rainfall and slope were of paramount importance in determining the likelihood of food production areas. However, the results also suggested that a single, generally applicable model of cultivation will require complex interactions between economic, governmental and population characteristics in addition to local landscape/geophysical properties.

Pointing out the importance of seed as a means of promoting productivity, nutrition and resilience, Shawn McGuire and Louise Sperling investigated how smallholder farmers obtain seed of their crops. The authors were able to draw upon a uniquely comprehensive data set of 9660 observations across six countries, covering 40 crops, and found that smallholders obtained over 90 % of their seed from informal systems and over 50 % from local markets. Moreover, 55 % of farmers paid cash. As

✉ Richard Strange
r.strange@ucl.ac.uk

¹ University College London, London, UK

a result of this work the authors propose interventions that are aimed more specifically at the demand side for seed, i.e. the smallholder farmer, rather than the supply side.

Varieties of NERICA rice, an abbreviation of New Rice for Africa, are the results of crosses between Asian rice (*Oryza sativa*) and African rice (*Oryza glabberima*). Tomonori Yokouchi and Kazuki Saito, working in Benin, investigated adoption of these varieties, which provide advantages in terms of yield and disease resistance. There was a distinct difference in rates of adoption between farmers who belonged to a group (74 % adoption) and those who did not (29 % adoption). Moreover, as seed of NERICA varieties sold at higher prices to the public sector rather than to local markets, their production has become an incentive for farmers to grow these varieties. The authors suggest that farmer-to-farmer seed exchange needs to be enhanced.

Pests and diseases are ever-present threats to the cultivation of plants and are the subjects of the next two papers. Tadele Tefera and colleagues discuss developing and deploying insect resistant maize varieties in order to reduce pre- and post-harvest food losses in Africa. They point out that the yield of maize grain in Africa is low at 1.5 t ha^{-1} compared to the global average of 4.9 t ha^{-1} . Insect pests, where present, are part of the problem with stem borers causing 10–15 % yield losses and post-harvest pests, such as the larger grain borer and maize weevil causing 14–36 % losses. Although control may be achieved with chemical insecticides, these are expensive and may affect farm workers if used improperly. Varieties of maize, which are resistant, are preferable as resistance is in the seed, removing the necessity of using noxious chemical sprays.

Armand Bergamin Filho and co-authors discuss how plant diseases spread and how the understanding of this is critical for control. Classically, two types of disease epidemics were recognized – monocyclic and polycyclic. In the former, further inoculum is not produced on or in infected plants during the course of an epidemic but comes from outside, the sources being, for example, the soil, a secondary host, or infected crop plants of the same host in other fields. In contrast, in polycyclic disease further inoculum is produced on the previously infected plant. In fact, some diseases, which have elements of both types of epidemiology are quite common and give rise to serious diseases. Their management is difficult and requires collective action at the farm, community, or national scales.

Julius Manda and co-authors surveyed 810 households in the Eastern Province of Zambia in order to assess the determinants of children's nutritional status and also to find out if there were any impact of improved maize varieties. Age of the child was a critical factor, as nutrition worsened with age; in contrast, better education of household head, number of adult females in the household, and

access to better sanitation were all positive factors. Moreover, adoption of improved maize varieties reduced the probability of stunting by 26 %.

Majola Mabuza and co-authors report on determinants of the frequency and extent of employing food insecurity coping strategies among rural households in Swaziland. This country's Global Hunger Index (GHI) worsened from 10.4 to 14.4 between 1990 and 2013. One possible reason is the increased frequency of droughts, attributed to climate change. The authors formulated a Coping Strategy Index based on a single question: "What do you do when you do not have enough food, and do not have enough money to buy food?" Data on frequency of use and severity of 12 coping strategies, ranging from "relying on less expensive or less preferred foods" to "skip entire day without eating" were obtained from 979 households. Policy interventions suggested by the authors were increase in availability of higher levels of education, intensification of on-going pro-poor large irrigation projects and improvement of farmers' access to markets.

Göran Bostedt and co-authors draw attention to the slow and steady decline of people who follow a nomadic, pastoralist way of life, becoming instead sedentary agro-pastoralists. The transition between the two life styles provides an opportunity for improved diet diversity, especially concerning food groups that include roots, tubers, fruits and leafy vegetables. However, an important factor that limits the uptake of this opportunity is lack of information and knowledge at the household level. The authors suggest that this may be overcome by agroforestry extension services and that NGOs have an important role to play in providing these.

The conference reports concern two pressing topics, informing policy makers of the science of climate change and the linkage between agriculture and health. In the first of these, Abid Hussain and co-authors report on deliberations, which took place in Islamabad in July 2015. These were divided into five themes: High level leadership and climate; Climate change and water availability; Climate change and food security; Community vulnerability, adaptation and gender; Ecosystem-based adaptation to climate change.

The Leverhulme Centre for Integrative Research on Agriculture and Health (LCIRAH) has organized annual conferences for the last 5 years. The title of the 2015 conference was Agri-health research: what have we learned and where do we go next? Here there were three themes: Gender in Agri-health research; Nutrition-sensitive agriculture - pathways and policies to connect agriculture and health; Innovative methods and metrics for Agri-health. As reported by Fiorella Picchioni and co-authors the topics were wide-ranging and informative about the importance of the consumer in making agriculture nutrition sensitive.

Ann Bruce reviews a report on the "Critical role of animal science research in food security and sustainability", one of

the reports published by the US National Research Council, with the intention of informing government policies. She found it a rich source of information and reference material, covering a wide range of topics.

Steve Hughes, reviewing the book “RICE – Global Networks and New Histories” edited by Peter A Coclanis and associates, found much to recommend it to those practically concerned with rice or food security. Like the LCIRAH conference mentioned above, the subject is divided into three sections. The first is perhaps rather idiosyncratically titled ‘Purity and Promiscuity’ but refers to the tendency of rice to outcross and self-diversify against the efforts of human cultures to maintain varieties with familiar characteristics. The second section has the readily comprehended title ‘Environmental Matters’ and the third ‘Power and Control’ is largely a review of the history of rice culture. Steve concludes his review with the following two pithy sentences: “The way forward depends as much on the ability of technologies to adapt to changing cultures as the ability of cultures and institutions

to adapt to changing technologies. We ignore the constituent social dimensions at our peril.”

Richard Strange, Editor-in-Chief of Food Security. Richard Strange’s background is in Plant Pathology, a subject to which he was attracted by its relevance to food security and in which he has published over 100 papers and two books. He currently holds an Honorary Chair at University College London and is a Fellow of the International Society of Plant Pathology. He has been involved in numerous overseas projects, several of which were located in African countries, and

has supervised Ph.D. students from these and other countries of the Developing World in topics directly concerned with plant disease problems affecting their food security.