World Soil Resources and Food Security (Advances in Soil Science)

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In the past decades soil science has branched out considerably and soil scientists now work on a wide range of issues, for example, soil contamination, processes in the critical zone, the environmental effects of nanoparticles, the geohydrology in urban areas, or the ubiquitous role of soils in the changing global climate. Traditionally, soil science had strong links with agriculture and the production of food, fiber, fuel, and feed. Those strong ties weakened in the 1980s and 1990s following a decreased interest in agriculture and the fragmentation of the soil science discipline. Since the world food crisis of 2008, that was somewhat overshadowed by the financial crisis that happened concurrently, agriculture came back on the global agenda. This was helped by several factors including the upsurge of biofuel production that competed with land for food production, a couple of adverse weather conditions in major food production areas, land grabbing that happened in some parts of the world, a sharp increase in food prices, and the realization that the world has to feed over 9 billion people in 2050. In summary, agriculture and food production are topical issues again, and readers from this journal understand the importance of soil resources and food security in which they give an authoritative overview on issues like soil and climatic effect, soil resilience, per capita arable land, energy use, diet preferences, C sequestration, and soil degradation. Each of these are treated succinctly and come back in various subsequent chapters. Chapter 2 focuses on the global food situation whereas Chapter 3 deals with world soil resources and they are reasonably up-to-date, and consistent in its conclusions but not well connected. The global soil resources presented use Soil Taxonomy and the soil order maps are consequently based on the 1:5 Million FAO-Unesco world soil map. The authors discuss some of the characteristics and potential for each order but present no global food production potential based on these resources.

The introductory chapters are followed by two detailed case studies on soil resources in Asia (total 220 pages) focusing on forested and agricultural ecosystems and acidification in upland soils, and an author reviewing how soil resource affect food security and safety in South Asia (India, Bangladesh, Nepal, Sri Lanka, Pakistan). This chapter discusses both the biophysical aspects of improving food production, and also food safety and food quality. The next chapter deals with the formation and management of Vertisols in India which are important soils for food production. The following chapters deal on a broad range of subjects including the role of nuclear techniques and isotopic in sustainable land management, new paradigms for rainfed agriculture in the semiarid tropics, land degradation, and the assessment of soil nutrient balances in Sub-Saharan Africa. The concluding chapter deals with research needs for credible data on soil degradation and its relation to agronomic production.

There is much information in this book covering a somewhat unbalanced range of subjects related to the theme of food production and soil resources. Most of the information is well-summarized in the three introductory chapters and the newer and updated information (e.g., on land degradation or nutrient balances) refines earlier assessments but makes no shift in conclusions. There is an Asian dominance in the book, only one chapter on Sub-Sahara Africa but no chapter on Latin America. Some of the information is somewhat dated, and it is unfortunate that most of the maps are printed in black-and-white by which most of the information is lost. All in all, this book provides valuable reading and information on an important topic: how we can maintain and improve the world soils and feed the growing human population.

The motto for the 7th International Congress of Soil Science in 1960 in Madison, WI was “Alleviate Hunger, Promote Peace through Soil Science”. In his presidential address R. Bradfield mentioned that he can think of no single group of scientists who have more to contribute to feed the world than soil scientists. He also mentioned that they have had more experience and in general more success in increasing food production than population experts have had in population control. More than 50 yr later, the debate on global food production in relation to soil resources has many angles and aspects of which a considerable number have been treated in this book. For much of the world, however, we have out-of-date soil information that is hard to access. One of the challenges facing the soil science community is to update the information and given the tremendous leap in technology for collecting and collating soil data that should be an encouraging task. It should be noted that amongst the factors of food insecurity and soil degradation, we silently suffer from insufficient numbers of well-trained soil scientists to tackle the problems that confront humanity. This is particular the case for those areas where population growth and food insecurity is largest.

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