Renewable Agriculture and Food Systems: 25(3); 252–253

Book Review

Plan B 4.0: Mobilizing to Save Civilization. By Lester R. Brown. W.W. Norton and Co., New York, NY. 368 p., paper, $16.95, ISBN 978-0-393-33719-8.

With an incredible level of energy and unwavering focus over the horizon, Lester Brown never ceases to amaze his readers with yet another annual greenprint for the future. *Plan B 4.0: Mobilizing to Save Civilization* is the update of his new approach begun in 2006 with the first *Plan B*. With a shrewd economist's eye on the present and a futurist's vision of what is over the hill, Dr Brown provides us with a summary of contemporary challenges as well as feasible options on how to solve them. This is a must-read book for those who are serious about development and the future of our species.

Aptly titled 'Selling Our Future', the first chapter opens with a brief historical look at prior civilizations, and speculates that, in spite of our sophisticated technologies and global communications, we have not solved the dual challenges of financial stability and food equity. He cites three trends as key to growing shortages of grains to sustain us: increasing population, growing protein consumption and more bio-based fuels. Food security is further challenged by soil erosion, depletion of major freshwater supplies and climate instability. Insecurity in the world grain trade emerges as a consequence of geopolitical struggles, with national limits or bans on exports and the land rush by outsiders to acquire productive areas in Africa. In a bold listing of *failed states*, Dr Brown chronicles the combination of overpopulation with respect to available resources that will make it impossible for many countries to solve the hunger problem on their own. As with previous editions, *Plan B 4.0* to some extent discounts the potential of new technologies to allow us to continue current lifestyles. Fortunately, there are current solutions available based on present technology, but they must be implemented in a massive way, and it must be done now.

The pressure that our growing human population puts on available soil and water resources is documented in Chapter 2 with a series of specific examples of land loss and degradation as well as declining water tables in some areas that have provided a foundation for the advances of the Green Revolution. Competition for scarce water by cities and by industry demonstrates how these immediate needs outweigh farmers' ability to access water for food production, a short-term but serious complication that will last until many people are truly hungry. Loss of productive land and natural resources is causing a new class of what Dr Brown calls *environmental refugees*, people squeezed out by encroaching deserts or dropping aquifers. Most of the author's descriptions of declining resources would cause a little debate in any circles.

Continuing doubts about climate change are addressed by the evidence in Chapter 3. For example, such biological realities as the plateau of photosynthesis at 20°C and the increase in respiration beyond that point lead to reduced crop yields, one consequence of global warming. Thus it is not only the increasing CO_2 content and greater potential for greenhouse effect, nor the melting of glaciers and rising seas that threaten our food supply, but also the larger disruption of terrestrial ecosystems due to the increasing climatic instability and reduction in global potential for food production.

A series of responses to this emerging reality are proposed, including an improved efficiency of energy use through design and conservation (Chapter 4), a major shift to renewable energy (Chapter 5), better design of cities for reducing energy and water use (Chapter 6), confrontation of the population issue through education (Chapter 7) and renewal of the Earth and its resources through restoration of forests, grasslands and oceans and their attendant biodiversity (Chapter 8). Of greatest immediate interest to those in agriculture is the focus in Chapter 9 on creating adequate nutrition for our current and future populations. Given that most potentially productive lands are already under cultivation, we have no choice but to increase productivity of current farmland. Yields of major cereals have leveled, wheat at 7 metric ton ha^{-1}, rice at 5 metric ton ha^{-1} and maize at 10 metric ton ha^{-1}. Only with extraordinary and often non-profitable application of fertilizers and other inputs can we push production above these levels, and the response per unit of inputs has declined drastically for the past two decades. We have maxed out on the potential for irrigation and must now learn to use our finite water resources much more efficiently. The demand for animal protein must take into account the differences in conversion efficiency from kg of feed to kg of meat produced by beef (7 : 1), swine (3 : 1), poultry (2 : 1) and fish (< 2 : 1). There is growing recognition of the efficiency of local food systems, a future priority that is in direct contrast to the recent move toward globalization. Important to educators in agriculture is the need for a food system that moves consumers down the food chain, reduces the use of grain to fuel vehicles and elicits essential attention to the human population factor in the global food picture. Since these directions all go against the grain of current society in most countries and they move into areas that most instructors would rather not touch in courses in agriculture, it will take courage and commitment for those in education to embrace a new paradigm for the food system.

In the concluding Chapter 10, 'Can We Mobilize Fast Enough', Lester Brown presents the challenge as an essential implementation of massive change through Plan B. Four goals are: 'stabilizing climate, stabilizing population, eradicating poverty and restoring the economy's natural support systems', all of which are critical to reaching any semblance of global food security. Although a firm believer in capitalism, the author quotes Norwegian Øystein Dahl, the former vice president of Exxon: 'Socialism collapsed because it did not allow the market to tell the economic truth. Capitalism may collapse because it does not allow the market to tell the ecological truth.' Some of the components of a path toward a sustainable future include raising taxes on destructive activities such as fuel consumption, cigarettes and carbon-generating activities; phasing out coal and moving toward renewable, clean energy sources; shifting toward more energy-efficient transportation; and recognizing key tipping points in resource availability and environmental indicators. Brown cites the need for a mobilization that is similar to what was achieved in war time, one that will not be possible without significant change in social attitude toward both the current status quo and what will be needed in the future. While other authors are more optimistic about reduced consumption through social change, Brown comes across as a realist who thinks it will take a large wake-up call to make things happen.

Three models are suggested that could precipitate essential change. The *catastrophic model* is exemplified by Pearl Harbor, an event that changed how people in the USA thought about war. Although a powerful model, to wait for catastrophe is often to wait too long to change behavior, with the example of how carbon emissions are undermining the West Antarctic and Greenland ice sheets and when seas rise by several feet it will be too late to change. The *tipping point model* refers to the gradual buildup of evidence about problems that suddenly become evident and precipitate rapid change. The example is evidence about cancer caused by smoking, and the immediate impacts of accumulated scientific experience on smoking rates, medical costs to society and large court settlements against manufacturers that caused large changes in behavior. The preferred alternative is the *sandwich model* that brings potential for relatively rapid social change. As an example, recognition of the need to reduce carbon emissions caused a shift away from burning coal, a move toward more fuel-efficient vehicles, a rapid growth of wind and solar energy technologies and consciousness about the critical need for energy conservation. These trends are all emerging as important in the USA and across the globe.

To implement *Plan B 4.0*, Lester Brown proposes that we need a quantum change in economic and political attitude and that we need to look carefully at where resources are invested. He estimates the annual costs of major needed global changes at $10 billion for universal education, $4 billion for adult literacy based on volunteer teachers, $33 billion for basic health care in developing countries, $17 billion for reproductive health care and family planning, $3 billion for preventing spread of AIDS virus, $6 billion for school lunch programs in the 44 poorest countries and $4 billion for assistance to preschool children and pregnant women. The total of $77 billion to provide these basic social services is only about 5% of the current annual global military budget of $1464 billion. In another striking comparison, Dr Brown calculates the annual cost of planting trees to conserve soil and sequester carbon, protecting cropland soils, restoring rangelands and fisheries, protecting biodiversity and stabilizing water tables at $110 billion, or just under 8% of the annual global military expenditures. He poses this final question: Can we afford not to undertake these social and environmental priorities? And comparing this expense to that of military equipment and operations, which will more likely lead to a sustainable future world society?

Charles Francis, 279 Plant Science, University of Nebraska, Lincoln, NE 68583-0915, USA. email: cfrancis2@unl.edu
doi:10.1017/S174217051000027X
First published online 4 June 2010