# SSSA Past President's Message

## **Back to the Future**

by Rattan Lal

very time one travels from the U.S. or Western Europe to sub-Saharan Africa (SSA) and South Asia (SA), one is struck by two distinct scenarios for applying the knowledge of soil science to the pressing global issues. One is to modernize or replace the subsistence agricultural practices in SSA and SA suspended in time dating back to centuries if not millennia. The other is to use soil science to help solve the problems of the modern civilization through the 21st century. The first scenario must endeavor to use soils in SSA and SA with the focus on meeting the basic necessity of life (e.g., food, feed, fiber, and fuel). The second is to use soils in the developed/industrialized societies to improve the environment, mitigate climate change, dispose of industrial/urban and nuclear waste, grow biofuel feedstock, and produce industrial raw materials.

The commonality in both scenarios, towards soil management strategies in developing and developed economies, is the strong link between the human diet and agricultural sustainability. Promoting healthy diets human in populations has a strong impact on sustainable agricultural practices. Apparently, obesity, heart disease, and type-2 diabetes are health-related problems in developed countries. In contrast, hunger caused by low-caloric intake, hidden hunger by lack of protein, and malnutrition by deficiency of minerals (i.e., zinc, iron, and iodine) are problems in developing countries of SSA and SA. Both of these issues are strongly linked to sustainable agriculture in general, but judicious management of soils in particular. It is easy to find these contrasting scenarios separated by just 15 hours of air travel from the U.S. to SSA and

SA. Visitors to these contrasting situations can feel like they're in a time warp.

## The Al-Khwarzimi Approach

One can accept the status quo and be contented by saying "tatha astu" (so be it). The other option is to be proactive and do something about these equally dire but contrasting scenarios. Indeed, soil science has a bright future in addressing both by using some kind of algorithm. An Arabic treatise of 12th century A.D. On the Hindu Art of Reckoning was translated into Latin, thus giving the world its decimal system. The author of this treatise was a scholar from Baghdad by the name of Muhammad ibn Musa Al-Khwarzimi. His name was Latinized into Alogoritimi and eventually Anglicized into Algorithm, meaning a technique of solving problems step by step (New York Times, 23 Sept. 2007).

Soil scientists may have to adopt the Al-Khwarzimi (algorithmic) approach to address these contrasting scenarios by taking one systematic step at a time. Soil scientists can neither afford to ignore the resource-poor farmers and 850 million people facing food insecurity (Borlaug, *Science*, 19



Oct. 2007), nor those in the affluent world who are rapidly spoiling their own nest by the wastes produced through a lifestyle that leaves a lot to be desired. Fortunately, the basic principles of soil science to address these two contrasting scenarios are the same: soil ethics based on stewardship of soil resources.

### The Sacred Battle

Soil degradation and desertification in SSA, SA, and elsewhere are the root cause of low yields, hunger and malnutrition, civil strife, and political unrest (Fig. 1). Any successful resolution to eliminating hunger/poverty and political/social instability necessitates reversal of the soil degradation through investments in

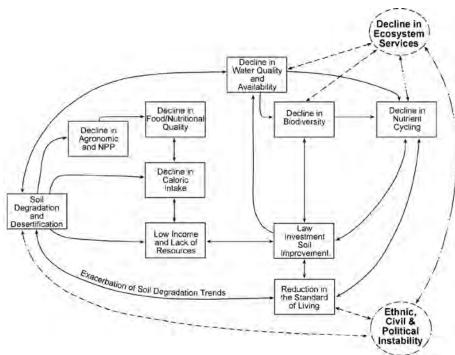


Fig. 1. Soil degradation-induced poverty, starvation, and political/ethnic/social unrest must be reversed through investment in soil restoration.

restoring degraded/desertified soils and ecosystems. If the traditional "Green Revolution" concept is valid for these regions, it will have to be realized through improvements in soil quality and sustainable management of soil and water resources in conjunction with the adoption of improved cultivars grown within ecologically compatible cropping/farming systems. Soil water management, expansion of irrigated land area, use of drip subsurface irrigation, and use of slow-release formulations of a new generation of fertilizers are among the key elements of such a strategy. Soil scientists must take the lead in winning the sacred battle of providing food for all and making "food as the basic human right" as their motto.

#### A Tortoise on the Fence Post

If one comes across as a tortoise sitting on top of a fence post, seemingly enjoying the limelight and the view from the vantage position, it does not take a rocket scientist to figure out that it did not get to such a privileged position on its own. It must have been the thoughtfulness of the entire community (membership of SSSA) that not only raised it to this position but also provided an unconditional support throughout the duration of its stay on such a unique and privileged status. The panoramic view from the top of the fence post was also made pleasantly memorable by the dedication, commitment, and high professionalism of those who provided the best support on a day-to-day basis (the entire headquarters staff of the Societies).

While looking back to peer into the future, it is important to thank everyone for the unique privilege, the great honor, and the opportunity of a lifetime. While remembering the slogan "In Soil We Trust," I remind you all of the sacred mission of "Food as the Basic Human Right" and "Improved Environment for Generations to Come."

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