

A Global Tool Box to Manage Water and Nutrients for Agri-Communities

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The course was introduced by Dr. Gary Peterson, President of the Soil Science Society of America and presented by Dr. William Herz, Vice President of Scientific Programmes of the Fertilizer Institute, Dr. Theo Dillaha of Virginia Technology and Dr. Eric Fernandes, Agricultural and Rural Development Advisor of the World Bank

Dr. Herz addressed nutrient use and depletion in agriculture, and their implication on the global food crisis and decreasing food stocks that may cause food shortages. The three most critical nutrients were nitrogen, phosphorus and potassium. There was a global unsustainable trend of decreasing fertilizer efficiency, i.e., to grow less and less crops while using increasingly more fertilizers. This trend of a net removal of nutrients from soil was caused a yield optimization approach seeking profit maximization. He introduced a number of advanced agricultural tools that would help minimize environmental risks without reducing crop productivity, which included: onsite evaluation, geographic information, field management, planning software, soil testing, conservation tillage, pest scouting, optimal application timing and rate, crop rotation. These needed to be tailored to the specific agricultural field.

Dr. Dillaha focused on the issue of efficient water management - how to produce more crop and value per drop of water would be one of the most difficult challenges we faced in the next 50 years. Important indicators, such as living planet index, food price index and irrigated area indices demonstrate that irrigation might not be a solution to it. Tools he introduced for better water investment options on a field scale included water harvesting, improved nutrient management, improved seeds and pest management, and, on a larger scale, watershed techniques and ecosystem services. In watershed management, where many external stakeholders were involved, trade-offs were inevitable. Better management of rainwater and soil moisture and supplemental irrigation were the key to helping the greatest number of poor. There remained significant challenges to improving water use efficiency, particularly in sub-Saharan Africa. Higher economic water productivity could be achieved by switching to higher value products such as flowers, fruits and vegetables, and even, at current prices, cereals. Some lessons learned for water management education should be to target women, the poor and other most involved in agriculture, while fixing land tenure rights. In addressing technical issues, social and environmental considerations must be taken into account.

Dr. Fernandes demonstrated some water and land management tools through a case study of communities along the river Zambezi in Mozambique. Those rural communities faced a range of water-, land-, and climate-related challenges particularly to the vulnerable groups of population. Climate change, for instance, would affect food-producing regions in such ways as changes in precipitation patterns, more frequent extreme and erratic events, such as floods, drought and storms. Zambezi river flooding had quite staggering impact, causing losses of an order of magnitude as high as one fifth of Mozambique's GDP. Tools to access and manage such enormous risks, as well as establishing communication with major groups and academia were needed. An iterative adaptive management approach that incorporated science and monitoring was also used.

