

9 x 2050

Joel D. Anderson  
Development Director  
Kansas State University  
Office of Research and Sponsored Programs (ORSP)

As our nation looks towards the "Grand Challenges" of the future, we see an ever present desire and need to remain competitive across a rapidly expanding landscape of traditional and non-traditional technologies. This need, in the context of agriculture for example, ranges the full spectrum of platforms collecting data to farmers actually needing cost affordable opportunities to use data and information from a real time knowledge management standpoint.

Collecting the data is only a small piece of the pie. Applications cross a multitude of need but a challenge is to provide flexible solutions that enable providers to enhance their yields, reduce waste, be environmentally sound, support their profitability margins and in the case of agriculture feed an exploding global consumer population.

From a practical standpoint, the world will experience increasing demands to feed a world population projected to exceed 9 billion people by 2050. In this context, we must figure out better ways to efficiently maximize the use, development and introduction of innovative approaches to technology, information and knowledge that can enhance what will become a critical need for global food production. Not critical today but watch what unfolds in the next 37 years. What will the challenges be? I would venture water then food production will become major flash points in the future. In some respects, they already are. We must assess and work collaboratively to determine efficient ways to address the associated challenges through technology, information and knowledge management and in providing adaptable practical tools and solutions that facilitate responsiveness to need.

This hybrid blend of technology, data and knowledge management will become an increasingly significant asset, crossing multiple domains, and meeting an ever increasing demand to maximize applications for dual use technologies. Today an environmentalist, tomorrow a farmer, the next day a different industry service provider, and quite possibly the concurrent needs of a weather forecaster and immediately following a first responder amongst a myriad of other applications. We must address better ways to enhance science and technology to meet emerging needs while addressing a wide array of policy related challenges and opportunity.

In terms of data collection, analysis and knowledge management remotely sensed geospatial information, for example, and it's processing, exploitations and dissemination (PED) are no longer in the sole domain of particular entities, but are becoming increasingly available commodities across a wide user base. In addressing our future challenges we need to effectively and efficiently implement innovative approaches to data utilization and knowledge management. Effective collaboration and implementation of solutions will become increasingly important across every common denominator from the macro to the micro within government, industry, academia and a growing civil market place.

To meet critical future challenges we need to enter into a fundamental dialogue that spans policy, science, and technology considerations. In this dialogue we need to remain cognizant on ultimate

end users of technology and possibly more significant, the ultimate consumer of related agricultural products for example.

Issues abound. How we address them will be fundamental to near, mid and long term challenges. Water consumption, already a critical natural resource and environmental issue, is projected to see an increase in utilization to meet production needs. According to an article in Reuters by Alister Doyle , found at <http://www.reuters.com/article/2012/09/10/us-water-idUSBRE88913W20120910>, “The world needs to find the equivalent of the flow of 20 Nile rivers by 2025 to grow enough food to feed a rising population and help avoid conflicts over water scarcity...” How we optimize systems to meet the agricultural needs of a growing population will become increasingly important. In and of itself, the optimization discussion serves as a poignant example of the crossroads of science, technology and policy discussion, debate and deliberation.

Science and Technology will be key enablers in meeting a real need to increase food production necessary to feed a population expected to exceed 8 Billion by 2025, 9 Billion by 2043 and 10 Billion by the end of the century. As we address our “Grand Challenges” we must not lose site of the reality that enabling science and technologies will cross traditional and non-traditional approaches and solutions that ultimately will meet a much broader collective need.