Precision Agriculture for Sustainable Agriculture in Kenya

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For long time Kenya's agriculture has been rainfall dependent. However Rapid industrialization has deteriorated the environment to its fullest extent during the last two decades. Industrial effluents, polluted air, noise pollution, Green House gas effect have not only affected human habitat but also posed a huge challenge to rainfall patterns. It is becoming quite difficult to predict the rainfall pattern compared to two decades ago, affecting farming in Kenya where not many farmers have the capacity for irrigating their land and produce on large scale and therefore are victims to the unpredictable rain for their crop.

Only 15-17 percent of Kenya's total land area has sufficient fertility and rainfall to be farmed and only 7-8 percent can be classified as first-class land. Agriculture is also the largest contributor to Kenya's gross domestic product (GDP). I wish to veer a bit and address one challenge facing Kenyan farmers; unpredictability of yields and poor resource management which could largely be solved through precision agriculture. Precision agriculture is a farming management concept based on observing and responding to intra-field variations. It relies on new technologies like satellite imagery, information technology, and geospatial tools. It is also aided by farmers' ability to locate their precise position in a field using satellite positioning system like the GPS.

The concept of precision agriculture first emerged in the United States in the early 1980s. In 1985, researchers at the University of Minnesota varied lime inputs in crop fields. It was also at this time that the practice of grid sampling appeared.

The benefits of precision agriculture include; making agricultural practices environmentally and economically justifiable, technologically feasible and increase the stewardship of land, water and related natural resources. In Africa, implementation and use of precision agriculture will not succeed without challenges of small farm holdings. In this case, the way forward will be to take this technology to small farmers through government sponsored initiative and continuous research. The message has to be taken to farmers that they have to get more involved in using emerging technologies while also providing training in the use of GPS equipment and GIS software for local technician. It will also be key to ensure reliable operation and maintenance of highly specialized equipment.

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Reaching small scale farmers can be possible by having user friendly agricultural extensions and utilizing the digital villages. Web resources, mobile phone applications and relevant spatial agricultural data will help in providing the necessary infrastructure for practicing precision agriculture.

Notably, small scale farmers would want relevant content to build on their knowledge base. This would entail query and answer services, suggestions on best practices, alternatives on traditional practices, predictions on climatic conditions, the effects and how yield volume will be predicted.

A good example of and African success story is Sudan. GOLDER, an international company working with ASBNACO a Sudan based company uses commercial merchandised farming. As part of this project, the GPS and the GIS technology has been introduced to improve farm productivity while conserving the environment. This has been achieved through an acquired auto-steer tractor, fitted with a GPS satellite guidance system that controls tractor steering.