Geospatial Technologies as SMARTAgri Tool for the next level of Advanced Agriculture:
The African Perspective

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Africa’s Challenges

• Low agricultural productivity and major environmental constraints

• 25% decline in rainfall over the last fifty years has had serious consequences for dryland areas

• Per-hectare yields for most crops are among the lowest in the World

• Increases in production have generally been obtained by putting more land under cultivation

• Over the last twenty years, 229% increase in farmland accounted for 70% of the growth in regional production

• Lack of access to technology and inputs

• Inadequate infrastructure and land tenure arrangements

• Weak links to markets, lack of market information and incentives
Livelihoods are mainly based on exploitation of natural resources—principally agriculture.
Policy Context

African leaders have pledged to support the transformation of agriculture, as evidenced in the Comprehensive Africa Agriculture Development Programme (CAADP) developed under African Union auspices of the New Partnership for Africa’s Development (NEPAD)
Africa’s Opportunities

- Agriculture is a critical factor in efforts to combat poverty and food insecurity
- It is still the largest employer with over 60% of the active population
- Agricultural export capacity brings in the needed foreign exchange earnings
- Cash and food crop and livestock production is rising steadily despite unfavourable regional and international environment
Paradigm shift required!
Paradigm Shift

The generation old model of agricultural growth is not sustainable in the long term, as production systems lag behind galloping urban development.

Move Africa’s agriculture from a largely subsistence sector to a more knowledge-intensive, market-oriented sector, sustaining growth and adding value to products.
Vision for Agriculture in Africa

- Align stakeholders including smallholder farmers; around a shared vision
- Agree to a set of priorities; land tenure, and resource management, climate change
- Develop efficient data collection plan
- Develop information and knowledge dissemination systems
- Monitor and report progress
ONLINE GIS PLATFORM

- Provide access to agric-related spatial data in a user-friendly mode
- Improve spatial data management and dissemination
- Provide on-line tools for extracting and sharing data and information
- Visualizing data across themes
- Access to quality data necessary for implementing agric projects
- Opportunity for enhancing quality of data disseminated
- Opportunity to scale up the availability of spatial data for agriculture development
Welcome...

Welcome and thank you for taking time to visit the Ghana Agricultural GIS online Platform. This platform gives you access to cross-sectional data and GIS data collected by projects including USAID funded ADVANCE and TIPCEE projects, ADRA Ghana Food Security Program, the Ministry of Food & Agriculture (MoFA), and GTZ/NOAP Project.

Application of GIS technologies in agriculture helps to provide essential information such as locations of smallholder farms, aggregators, processors, tractor service providers, warehouses, weather stations etc. To achieve a meaningful developmental impact, it has become necessary to share data among various stakeholders. This GIS online Platform has become the most appropriate means to make data available to end specific users and potentially to the public. This is expected to increase the efficiency of all value chain actors and industry leaders as managers base critical management decisions on reliable data. Ultimately, Ghana’s agricultural industry will become competitive in the domestic, regional and international markets.
Essential geospatial datasets

Ghana Landuse 2000

Identification Information:

Source: Ghana Survey Department
Feature Type: Polygon

Abstract:
Landuse dataset was generated from 30m high resolution Landsat 7 images acquired for such purposes as generating a national land cover and land use map to document and analyse the current state of land use in Ghana. This was a joint exercise carried out by Ghana Survey Department with technical assistance from CERSIS. The classification scheme used was ... made up of 7 classes namely:

Purpose:
This was to serve as a base for all land policy and land management analysis and discussion. To also give an indication the extent to which current human activities were affecting the nature and use of land in Ghana and help make relevant projections and review policies to preserve the land for its intended use.

Spatial Reference Information:

Geographic Coordinate System:
GCS_WGS_1984
Datum: D_WGS_1984
Prime Meridian: Greenwich
Angular Unit: Degree

Projected Coordinate System:
WGS_1984_UTM_Zone_30N
Projection: Transverse_Mercator
False_Easting: 5000000.00000000
False_Northing: 0.00000000
Central_Meridian: -3.00000000
Scale_Factor: 0.99960000
Latitude_Of_Origin: 0.00000000
Linear Unit: Meter
Soils
Land Suitability

Cowpea

Millet
Agric Statistics

GHANA AGRICULTURE
Online CIS Platform

Agricultural Commodity Prices | Crop Production | Imports & Exports | Ghana's Agricultural Budget | Agric Mechanisation & Farm Implements

NOMINAL WEIGHTED AVERAGE RURAL WHOLESALE PRICE (GH₵) PER MT

There are currently about 34 major markets that are being traced by Esoko with the help of field enumerators. These aggregated prices represented here are coming from MoFA. To get a live data on prices of commodities, please visit Esoko.

Select Commodity:

Cassava Price
Source: SRID – Ministry of Food & Agriculture, Ghana

Providing Geospatial Solutions for Sustainable Development
Agric Statistics

These graphs are extracts from COCOBOD and MoFA 2011 Facts & Figures showing the production levels in metric tonnes of major crops in the country. These figures would be updated as and when mandated institutions come out with new figures.

Select Commodity: Cocoa

Annual Cocoa Production

Source: Monitoring, Research and Evaluation Department of Ghana COCOBOD
Agric Statistics

Food Importation, 2010/2011
Source: Source: SRID – Ministry of Food & Agriculture, Ghana

- Maize
- Rice (milled)
- Millet
- Wheat
- Groundnut
- Cowpea
- Soyabean

Providing Geospatial Solutions for Sustainable Development
Agric Statistics

Food Exportation, 2010/2011
Source: SRID – Ministry of Food & Agriculture, Ghana

Select: Exports

- Maize
- Rice (milled)
- Sorghum
- Yam
- Plantain
- Groundnut
- Cassava

0k 1k 2k 3k 4k 5k 6k 7k 8k 9k 10k 11k

Exportation
## Agric Statistics

### Available Total Domestic Production Available for Human Consumption*, 2010/2011

**Source:** Source: SRID - Ministry of Food & Agriculture, Ghana

<table>
<thead>
<tr>
<th>Commodity</th>
<th>Production</th>
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<tbody>
<tr>
<td>Maize</td>
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<tr>
<td>Rice (milled)</td>
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<td>Millet</td>
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<td>Sorghum</td>
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<td>Cassava</td>
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<td>Cocoyam</td>
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<td>Groundnut</td>
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<td>Cowpea</td>
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<td>Soyabeans</td>
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</tbody>
</table>

**Graph:**
- [Graph of Available Total Domestic Production Available for Human Consumption*](#)
Some major players in Agriculture Mechanisation:

- John Deere
- RST

Regional distribution of Agric Mechanisation Services Enterprice Centers

Source: MOFA, Ghana

87 out of 170 AMSEC centres have been established nationwide. These centres have been equipped initially with five agricultural tractors and matching implements and some maize shellers. During quarterly monitoring visits conducted to some centres it was noted that some pro active AMSECS have privately sourced for additional machinery to service farmers along the value chain. Examples noted were Faby C., Mikleb Co. etc who have sourced for planters, shelters etc.
What about Precision Agriculture ??

Applying Inputs

• in the right amounts
• at the right places
• at the right times
Observations

• Countries in Africa use 60 to 70% of the world's fertilizers
• Yet farmers do not know the exact nutrient content of their soils
• Thus low stagnating or declining crop yields
• Basic information on fertility of fields is lacking

Arguments

• Small fields 2ha or less
• Mechanization and sophisticated technology are beyond the reach of smallholder farmers
Precision Agriculture ??

Responses

• Research in precision agriculture is expanding in developing countries

• It can be practiced on most fields in developing countries to increase yield and improve profitability

• We should not discard technology, but adapt them to local farming practices

• Technology is part of the solution!

• Site specific advice on nutrient usage; land preparation; weed control; and access to credit
An Integrated Feedback System

Instant voice response (IVR), SMS, GIS/GPS, Radio and Web Technology for Improved communication between:

- smallholder farmers
- extension agents
- agro-dealers
- project implementers
- development partners
THANK YOU!