

## Could ICT be the Solution to Woo Youth to Agriculture?

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### 1. Introduction

Agriculture still remains the backbone of Kenya's economy sustaining over 75% of the homesteads in the country. It accounts for 27% of Kenya's real Gross Domestic Product (GDP), 60% of the total export earnings as well as 45% of government revenue (Kenya Investment Authority, 2011). Agricultural development is thus an essential instrument for economic growth and consequently one of the pillars of the country's blueprint Vision 2030. This therefore justifies the need to increase the involvement of the youth in the agricultural sector considering that the youth constitute the highest percentage (above 75.39%) of the population (World Bank, nd; Katindi, 2010). According to the Kenyan constitution, youth are defined as individuals between the ages of 18-35 years (GoK, 2010). With fast population increase and slow demographic transition, youth employment in Kenya remains a challenge with approximately 67% of the unemployed in the country being the youth (Republic of Kenya, 2008). Agriculture has considerable potential for job and wealth creation and may go a long way in absorbing a large number of un-employed youth and curb rural-urban migration and the risks that come with it.

The history of youth involvement in agriculture has been minimalist and has had a low impact to the overall outlook. In this regard, young professionals in agriculture are largely absent in strategic policy debates on agriculture for development. Agriculture as a career choice faces a myriad of misperceptions. For many young people, agriculture is perceived as outdated and a preserve for the old and those who failed to further their education and have no other alternative in life. In addition the number of students enrolling for agricultural degrees in sub Saharan Africa has

been on the decline since the 1980s (Bientema, 2011). This may be attributed to inadequacy of information on existing opportunities, lack of attraction to the industry especially the public sector which experiences poor conditions of service including poor remuneration and retirement packages and inferior work environment in terms of poor and outdated infrastructure and insufficient operating budgets attributed to years of underinvestment (Beintema and Stads, 2006: 13). In Kenya, the sector has not been spared and it has been facing an aging research pool due to civil recruitment freezes, the few qualified researchers leaving for greener pastures in international and private institutions (*Ibid*) and young agricultural graduates opting for jobs outside the agriculture sector (Kruijssen, 2009).

The narrative presented above calls for a need to mentor young people into believing in the potentials embedded in agriculture that not many have discovered. The reality that the youth comprise the highest population and is the same group that shuns agriculture translates into reduced revenue and thus a slowdown of the overall economy. On the other hand, with the high levels of unemployment and failure to secure formal employment easily, the youth are realizing that gone are the days of acquiring formal education for the sake of seeking white collar jobs. With the rising economy, individuals are taking it upon themselves to train for self-employment and entrepreneurship. If young people are convinced to change their attitude towards agriculture, both the sector and economy stand to gain monumentally.

Arguably, the reason why many young people find agriculture unappealing is that conventional agriculture in the country is

**Box 1: Examples of ICT application in agriculture identified during the 2011 Agricultural Society of Kenya Show at Jamuhuri Showground, Nairobi**

- Kenya Tea Development Agency Holdings Ltd (KTDA) uses GIS to map tea zones as well as tea selling and weighing points. The maps show tea factories around the country. GIS is also used to track factory fleets to ensure timely delivery of tea leaves to processing centres. They provide such maps to farmers, tea extension officers as well as marketers. The above requirements meant that this data could only be acquired using GIS and remote sensing techniques, and the results were displayed on a web portal for wider access of the digital maps.
- Jomo Kenyatta University of Agriculture and Technology (JKUAT) have initiated a programme called Farmers Voice Radio (FVR) where they partner with local vernacular radio station to disseminate agricultural information. These include extension services and Agri-tips via Short Messaging Services (SMS). A radio listening groups for youths has been initiated, where they get them to listen to what is being aired in Farmers Voice Radio and have a discussion. An SMS line has been avail for farmers to use to ask questions emerging from the radio discussions. Agriculture students are given chances to be interns at the broadcasting stations. The students engage farmers on live extension services and respond to their agricultural queries.

marked by the use of old and archaic farming practices. This “old school” outlook of farming dissuades most young people who turn to more appealing white collar careers or enterprises. One of the concepts seen as an incentive to drive more young people to adopt agriculture as a sustainable economic activity is the adoption of modern agricultural technologies in farming practices and the need to look at agriculture as a business.

In today's world, technology has taken a central role in development and most of the industries are incorporating digital technology to stay relevant in the market and to keep up with industry demands. Today, young people are the main users of the new ICTs (internet, mobile phone, and computer) which are growing much faster than older ICTs (television, radio, mainline telephones, and newspapers) (Katindi, 2010). Agriculture needs to keep up with the digital revolution and in so doing young people will be driven to farming as a means of earning a living.

New tools of communication have emerged, proving more efficient and further reliable. Mapping technology for example is one of the tools that can be used to promote agriculture. The use of Geographical Information Systems (GIS), Geographical Positioning Systems (GPS) and Remote Sensing enables the coupling of real-time data collection with accurate position information, leading to the efficient manipulation and analysis of large amounts of geospatial data.

In addition to technology, public private partnership (PPPs) is of importance in moving the youth to embrace agricultural activities. Combining the interdisciplinary strengths of the public and private sectors in partnerships

holds considerable promise for creating opportunities for training, introducing technological innovations and entrepreneurship and employment opportunities in the agricultural sector.<sup>1</sup> Capacity building on the other hand will be paramount if the youth are to maximise application of ICT in agricultural entrepreneurship.

### **Role of GIS and ICT in Agriculture**

GIS software empowers those working in agriculture and land management to gain a clear view of the environment, surroundings, and the factors that influence them. GIS is used in a variety of agricultural applications such as managing crop yields, monitoring crop rotation techniques, and projecting soil loss for individual farms or entire agricultural regions. GIS/GPS applications in farming are being used for farm planning, field mapping, soil sampling, tractor guidance, crop scouting, variable rate applications, and yield mapping. GIS software can be used to forecast elements that may affect agricultural productivity including climate change mapping (Centrin 1998).

Identifying and understanding the changeable elements on land empower farmers to create accurate forecasts, and plan for maximum productivity. This involves using GIS to identify where flood prone plains, discovering the best places for keeping livestock or growing crops as well as forecasting and planning for crop rotation. In food production and marketing, GIS can be used in mapping food production facilities on-site or nearby as well as track product distribution channels. Particularly, GIS can be used to map out

### **Box 2: ACTS promoting livelihoods through innovation capacity building**

ACTS's vision is knowledge for better livelihoods. One of the objectives of the institution is to contribute to better living standards for vulnerable groups including women and youth in Sub-Saharan Africa through embracing new technologies to unlock the hidden potentials in agriculture and other shunned fields. This is possible through improving the capacities of these groups to engage in formulation and practice of sound policies through appreciating and engaging actively in these fields.

YPARD

passable and most convenient roads and connections to markets from production centres (eSpatial 2011).

GIS provide farmers with a clear map of all of their geographical data, enabling them to discover efficiencies for effective land management and administration. This is by enabling them plot accurate boundaries and determine the size of the land compared to the intended use. It is important to consider that GIS data can be made open to exchanges in general, to co-operation with all of those who increment and/or use land databases. GIS integrates with Global Positioning System (GPS) technology to provide the optimum route to customer's locations whilst optimising the daily routes travelled by vehicles (eSpatial 2011).

GIS and GPS provide valuable tools in monitoring, predicting, managing and fighting the spread of crop pests and diseases. The tools offer opportunities for cost-effective and efficient targeting of control interventions. In monitoring, GIS can be used to determine the spatial extent and patterns of a disease and also to link the disease to auxiliary spatial data. GIS can also be used to predict the projected spread of diseases, to provide input for risk assessment models in pest control and in quantifying changing thresholds of pests and diseases due to climate change (H. Bouwmeester et al 2010).

### **ICT and capacity building: YPARD-ACTS collaboration**

ACTS together with YPARD (see Box 2) collaborated in holding a five-day training targeting young agricultural professionals. The training involved the use of GIS/GPS for mapping. The main objective of this training was to provide skills to young unemployed or underemployed agricultural professionals in Kenya so as to enable them engage in the agriculture, with focus on providing a marketable skill that can be of use by research organizations, universities, NGOs, consultants and farming cooperatives. The participants were drawn from all over the country and the youth, most of whom had a Bachelors degree in Agriculture or agriculture

related field were trained on how to use GIS and GPS to provide solutions to agriculture and environmental challenges. Being a unique concept, the training was intended to bring together a combination of three components; Agriculture, GIS and Entrepreneurship. The GIS component drew training material from the Technical Centre for Agricultural and Rural Co-operation (CTA) Participatory Mapping Training Kit and also borrowed from the Map Kibera example. Map Kibera was selected because of the simplicity of the concept and the fact that it was done by youth.

Map Kibera compose of a group of youth who developed a forum intended to open up the slum to the outside world. Kibera was a blank spot on the map until when young Kiberans created the first free and open digital map of their own community. Map Kibera has now grown into a complete interactive community information project.

Community mapping or community asset mapping is a participatory planning tool that engages youth in exploring their assets within the physical and social environment (*Asset Mapping Programme Manual for Urban Youth Centres*).

### **Lessons from ACTS/YPARD Training: recommendations for policy**

Students admitted that they learnt many important lessons that would help them in their day to day agricultural activities. They mentioned that GIS and GPS skills that they learnt from the training are important tools for planning and decision making with regards to agriculture in the community. Community participatory mapping was therefore applauded because of the new ideas and approaches on how to involve the community in the mapping exercise.

Entrepreneurship and consultancy were other aspects of the training. Students appreciated this component because they were equipped with hints and approaches on how to set up themselves for agricultural related businesses and consultancies and therefore be able to earn something out of it.

Participants suggested that there is need for further training on developing different thematic maps related to agriculture. More skills on how to analyse agricultural data and use them to influence decision making out of them is necessary. During training, emphasis is required on GIS examples related to agriculture. Students also suggested that opportunities for GIS experts in agriculture and horticulture should be discussed. Agribusiness management should be included in entrepreneurship and consultancy discussions. This would help participants to draw linkages between agriculture and enterprises.

Online forums for people with similar interests in agriculture should be initiated. These include participants and facilitators who want to continue having discussions pertaining GIS mapping application on agriculture. Continuous communication and follow ups with students via social media and emails should be maintained. These will ensure that students get updated in mapping, agriculture and entrepreneurship technologies and that they get a platform to air their views and challenges in the process.

Link up rural farmers with current technologies like GIS and how these can increase their farm output is important. This can be done by training youth with basic secondary education on how to apply GIS mapping in the farms and the importance of it. Getting college interns to work on practical projects in agricultural organisations will help them build on their experience and confidence.

## Notes

1. PPPs have benefitted the young people in various ways. For instance, the Ministry of Youth Affairs has collaborated with Amiran Ltd and youth polytechnics (e.g. Juja Youth Polytechnic) to support youths who want to engage in greenhouse farming. Amiran Ltd provides them with training as well as greenhouse facilities at subsidised repayable terms.

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