

E-Agriculture and E-Government for Global Policy Development: Implications and Future Directions

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In many developing countries smallholder farmer participation in agricultural input and output markets continues to be constrained by lack of market information. Actors in most developing country markets operate under conditions of information asymmetry which increases the costs of doing business and locks out smallholder farmers. Attempts to address this problem are currently focusing on the use of ICT technologies to provide market information and link farmers to markets. This study examines the awareness and use of one such technology – mobile phones. It finds for male and female smallholder farmers in Kenya a high level of awareness and widespread use of mobile phones, mainly for social purposes. This study further finds that a low level of education, the cost of airtime communication and the lack of electricity for recharging phone batteries are the major impediments to the ownership and use of mobile phones, with female farmers more constrained than males. A high awareness of mobile phones among smallholder farmers presents an opportunity to strengthen smallholder farmers' market linkage. However constraints to mobile phone usage of mobile phones will need to be addressed. The study findings indicate priorities for policy makers dealing with the specifics of ICT adoption as a tool to promote rural viability via rationalization of Kenyan agricultural markets.

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The global development of information and communication technologies (ICT) has created a new agricultural development paradigm that promises to transform the performance of the agricultural sector and

improve rural livelihoods in developing countries. Over the past five years, South Africa has witnessed a swift ICT-led transformation of its public service delivery with major innovations in key development sectors. The growth of e-agriculture is seen as an engine to accelerate agriculture and rural development, promote food security, and reduce rural poverty. This chapter examines e-agriculture initiatives in South Africa. It describes ICT applications in improving the quality of on-farm management decisions, agricultural market information system, e-packaging, product traceability, and online marketing to access lucrative global wine markets. The chapter also highlights key constraints, and identifies considerations to enhance the future prospects for e-agriculture. Given the strategic importance of agriculture in supporting the livelihoods of the majority rural population in South Africa, the successful deployment and effective utilization of ICT is pivotal for sustainable agriculture development and raising the standards of living of marginalized communities. The results of the paper demonstrate that South Africa has made significant strides in e-agriculture and tangible benefits have accrued to the agricultural communities.

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This study explores Nigeria's e-agriculture policies and those of other African governments. It also proposes what e-agricultural strategies these governments could adopt to enhance their agricultural output by examining the history of agriculture in Nigeria; the current status of Nigerian information and communication technologies and e-government policies with emphasis on agriculture. The analysis addresses the role of communications as instrument of national development. In view of the economic status of African countries, the study calls on Nigeria and other African governments to adopt a cautious approach as they embark on e-agriculture policies and acquisition of information and communication technologies to promote national development. The study calls on African governments to liberalize their agricultural policies, establish agricultural cooperatives, educate rural farmers and offer telecommunication services in the rural areas if they hope to raise their agricultural productivity.

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Establishment of the new institutions that could improve Polish agricultural market was one of the main goals of the Polish government agricultural policy in the period of economy transformation. The project of creating agricultural markets was successful. Several regional wholesale markets and commodity exchanges were established and most of them still function with good performance. These markets are the key important marketing channels for market-oriented farmers in Poland. They can also be seen as a source of electronic commerce innovations on the Polish agricultural market. The aim of the chapter is to present the process of establishment and first experiences of electronic market of agricultural products as one of the new e-commerce initiatives on the Polish agricultural market. The chapter also discusses conditions of the electronic exchange development and its impact on the Polish agricultural market.

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The rapid growth of Information and Communication Technologies (ICT) has increased opportunities to improve agricultural production, distribution, and marketing activities in Sub-Saharan Africa (SSA). Such initiatives are expected to provide vast social and economic benefits to the agricultural community and help uplift standards of living of society in general. The process of how ICT should be applied in agriculture to raise living standards of millions of poor Africans is not yet well understood. Therefore, there is a need to deepen our understanding of the socio-economic benefits expected from ICT use in agriculture, and most importantly, how these benefits will be realized in SSA. Some green revolution technologies failed in Africa and parts of Asia because of inadequate attention to context specific issues, irrelevance, and prohibitive costs. In that regard, this chapter describes a framework for sustainable e-agriculture development in SSA. The proposed framework is divided into three main parts; (i) e-service delivery (ii) ICT development and diffusion pathway, and (iii) e-information flow and e-content development landscape. In order to facilitate the effective diffusion and adoption of e-agriculture, a set of preconditions and "e-value creation" opportunities are assessed. The preconditions filter out "irrelevant" ICT, and e-value creation facilitates context specific and demand driven e-innovations in agriculture. The chapter identifies and discusses ICT illiteracy, lack of ICT policies, infrastructural deficiencies, and poverty as key challenges affecting the future success of e-agriculture in SSA. The chapter recommends the development of e-policies and e-strategies on e-content, e-trust, e-security, e-value addition to promote sustainable e-agriculture development on the African continent.

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Diffusion and Dissemination of Agricultural Knowledge: An e-Communication Model for Rural India

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Almost sixty five percent of Indian population is engaged in agriculture that contributes to food security of the world's second largest populated country. Though agriculture sector shares 26 percent of GDP, this sector is very crucial for the sustainable growth and development of India. The emerging agricultural challenges demand information intensive agriculture work and applications of state of the art knowledge to enhance agricultural productivity, but non-accessibility of information and subsequently awareness and knowledge gaps that exist in this sector, enormously affect agricultural productivity. Efforts are being made for e-communication of information in rural India. This chapter portrays such efforts of public and private sectors, pinpoints the problem areas for accessibility of latest agricultural knowledge and suggests an e-communication model suitable for transfer of agricultural knowledge in the rural areas of India.

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Dawn Hinton, Saginaw Valley State University, USA

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Rural communities are being heavily influenced by the ongoing modernization process taking place in all African economies and nations. Theoretically the modernization process is intended to help lead to an increase in the economic well being of the citizenry. However, one of the unanticipated outcomes of continuing urbanization and modernization, particularly for rural communities would be the loss of local social relations within such communities. This is similar to what happened in the Western context, where modernization, in the form of industrialization resulted in the loss of social relationships and increasing sense of alienation as cities formed. There is therefore a very real fear that in the African context, the ensuing modernization will result in a paradox where modernization may lead to an increase in economic well-being, but have the unintended consequence of increasing alienation and reducing the sense of community that exists in rural villages. The purpose of this chapter is two-fold. First, the authors theoretically explore the possibility of using Information and Communication Technologies (ICT) to develop a sense of community in rural villages and thus offset and mitigate the more negative aspects of the modernization process. Second, they propose a way to conceptualize this potential paradox by integrating the well established sociological concepts of *Gemeinschaft* (community) and *Gesellschaft* (individualism) with current paradox models of diversity and similarity curves. Such an approach has pedagogical utility in helping to describe and explain the modern paradox confronted by most of the African countries.

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An information society begins with a connected government and ICTs are the bedrock and founding pillars of such societies. To assist public administrators think beyond traditional e-government, this study describes a concept of connected government, whose philosophy rests on the integration of back-end processes that facilitate collaboration among government agencies. This chapter describes a case study of five government-owned organizations in a developing country environment where even the basic e-government services are barely available. This study was carried out to determine the extent of integration within and across government agencies, with the aim of stimulating some thinking within and among government managers and administrators, around the possibility that a connected government can indeed be established in a developing country setting. The study exposes shortcomings to inter-departmental integration not only of the organizations under investigation, but also of other similar enterprises in developing countries within the same context. The chapter concludes by proposing a set of recommendations toward diffusing connected government applications for inter-organizational collaboration.

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Zambia and e-Government: An Assessment and Recommendations

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E-government can benefit developing countries by enhancing the economy, increasing access to health care, improving bureaucracy, and consolidating democracy. Sub-Saharan countries have lagged behind the world in adopting this system of communications. A variety of reasons explain the lag, namely lack of national resources and an illiterate population. Zambia serves an example of democracy on a continent where freedom and peace are lacking, but also as a country where e-government is only beginning. This evaluation is the first to examine e-government there, and is carried out at five distinct levels: Current communication systems; Zambia's ICT policy; key central e-government websites; e-government at the provincial/municipal level; and at the individual level. As a result, this case study will evaluate how a developing country is struggling to provide government access and enhance the economy and suggests improvements needed if Zambia's e-government will become adequate and sustainable.

Chapter 10

Globalized Workforce Development and Responsible Global Citizenship through e-Literacy Capacity Building Programs for Low Income African Countries

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The skewed global workforce interactions during the agricultural and industrial revolutions still bother the antagonists of globalization but could be straightened by progressive workforce development policies that mutually benefit high and low income countries. In addition, the e-literacy and information technology boom have further narrowed spatial perception of geographic distance thus providing low-income countries insights on policy dynamics of high income countries and its impact on the rest of the world. Thus in order to attain equity and balanced global workforce development, this chapter explores the rational and different paradigms for capacity building on e-literacy in low income African countries so that their workforce would contribute to the globalized economy and civic responsibility. The chapter contends that e-literacy empowerment should be regarded as a human right issue and that through other ethical globalization efforts every person on earth should form part of the workforce for sustaining the global village.

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Building Capacity for Electronic Governance in Developing Countries: Critical Success Factors

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This chapter presents the essence of critical success factors with focus on building capacity for electronic governance (eGovernance) in a developing country jurisdiction. The results are borne of the authors' years of experience with regard to national eGovernance implementations in developing member countries of the Commonwealth. Critical success factors (CSFs) denote those aspects of, or associated with,

the new information and communication technologies (ICTs), which may be perceived as comprising core, key or critical factors against which the level of capability of National Capacity for ICT or eGovernance may be assessed, measured and/or interpreted. CSFs, perceived to be critical for the success of any eGovernance initiative is best modelled as a three-tier minimalist framework, comprising CSFs at levels described as macro-, meso-, and micro- levels. The nature of any given ICT initiative which is appropriate nationally in central government, locally in local government, or in the public service, in the civil service, or in some selected sector or jurisdiction of the national economy, whether existing or planned, and whether implicit or explicit, must take cognisance of the need for the identification of CSFs at the inception stage of the initiative.

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Information and communication technologies (ICT) have transformed health service delivery (HSD) in developing countries although the benefits are not yet fully understood. This chapter examines the use of ICT for HSD in the Namibian context. To obtain insights into the extent and degree of the current ICT uses, the chapter begins by mapping a HSD landscape for Namibia. The reported ICT use patterns are based on a primary survey of 134 patients and key informant interviews held with 27 health service providers (HSPs) in Khomas and Oshana regions of Namibia. The results from the survey indicate that Namibian patients use diverse range of ICT to access health services including the traditional television and radio, and the more modern mobile phones and computers to a limited extent. HSPs reported the growing use of ICT in various functional areas such as admissions, clinical support, family planning, maternity, and emergency services. The chapter identifies key challenges and policy implications to enhance the uptake of ICT-based health services in Namibia. The relatively high penetration rates of traditional ICT such as televisions and radios coupled with a growing use of mobile phones presents new alternative opportunities for expanding HSD to Namibian patients in remote settings. The chapter will benefit HSP and patients as they decide on affordable technology choices; and policy makers as they design interventions to stimulate the use of ICT in HSD in Namibia. The results provide key insights for other Sub-Saharan African countries contemplating ICT integration in health services.

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Zaipuna O. Yonah, Tanzania Telecommunications Company Ltd., Tanzania
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This chapter attempts to enhance the understanding and knowledge of Information and Communication Technologies (ICTs) in relation to the Tanzania National ICT Policy as a case study. The authors

extensively explore these pervading technologies as they impact on the education, commerce, social, cultural, and economic life of the poor Tanzanian people. The chapter looks at how Tanzania is coping with the issue of poverty eradication as one of the eight UN Millennium Development Goals (MDGs). It addresses the issue of digital divide and the role that ICTs can play in poverty reduction. Tanzania's efforts in embracing ICTs and the challenges facing the country in its efforts are also addressed. Overall, the chapter demonstrates that ICTs are a set of tools for knowledge sharing, which is a powerful means for poverty reduction. Furthermore, it is advisable to focus on information literacy rather than just focusing on computer literacy.

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Impact of E-Government Implementation on Poverty Reduction in Rural India:
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ICTs in general and e-governance in particular offer tremendous opportunities for improving demand-driven transparent and accountable service delivery targeting the underprivileged. The objective of this chapter is to examine the effects of E-government implementation in the context of widespread poverty in India through an extensive secondary data analysis on selected pro-poor initiatives in reducing poverty and improving rural livelihoods. Analysis also includes various contexts in which these ICT based interventions operate. Specific recommendations are made to involve the socially excluded groups in the design, implementation and access to e-government services. Governments to design appropriate public policies in implementing socially inclusive e-government strategies in the emerging information society draw the conclusion.

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The Development of an Organic Agriculture Model: A System Dynamics Approach to Support
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This chapter describes the problem state of organic farming development and procedures for modeling by the means of system dynamics, with emphasis on the organic products market. The modeling principles are described in the following steps: problem state formulation, development of causal loop diagrams, model development, scenario analysis and formulation of acceptable strategies. Basic structures developed by the system dynamics principle are presented. The concept of archetypes in the field of organic agriculture modeling is described. The simulation scenarios are formulated as a case study for the Slovenian organic agriculture.

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<i>James M. McKinion, USDA-ARS, USA</i>	

Precision agriculture has been made possible by the confluence of several technologies: geographic positioning systems, geographic information systems, image analysis software, low-cost microcomputer-based variable rate controller/recorders, and precision tractor guidance systems. While these technologies have made precision agriculture possible, there are still major obstacles which must be overcome to make this new technology accepted and usable. Most growers will not do image processing and development of prescription maps themselves but will rely upon commercial sources. There still remains the challenge of storage and retrieval of multi-megabytes of data files for each field, and this problem will only continue to grow year by year. This chapter will discuss the various wireless technologies which are currently being used on three proof-of-concept farms or areas in Mississippi, the various data/information intensive precision agriculture applications which use wireless local area networking and Internet access, and the next generation technologies which can immensely propel precision agriculture to widespread use in all of agriculture.

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<i>Nicolas Pejout, Centre d'Etude d'Afrique Noire (CEAN), France</i>	

Many of African States are focusing on ICTs and developing e-government infrastructures in order to fasten and improve their "formalisation strategy". This philosophy drives the South African State in its impressive efforts to deploy an efficient and pervasive e-government architecture for its citizens to enjoy accurate public services and for this young democracy to be "useful" to them. By focusing on the South African case, people will be able to understand the role of ICTs as tools to register, formalise and normalise, supporting the final objective of Weberian rationalisation. The author will consider the historical process of this strategy, across different political regimes (from Apartheid to democracy). He will see how it is deployed within a young democracy, aiming at producing a balance between two poles: a formal existence of citizens for them to enjoy a "delivery democracy" in which they are to be transparent; an informal existence of citizens for them to live freely in their private and intimate sphere. In this tension, South Africa, given its history, is paradigmatic and can shed light on many other countries, beyond Africa.

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