

Development Domains: Context and motivation

Strategic agricultural development policy and investment studies make growing use of geo-referenced data and spatial analysis methods. Spatial perspectives appear to provide decision makers with intuitive entry points for examining the performance of agriculture, a physically-extensive, economic undertaking that owes much to spatial patterns of natural and human-endowed assets. Spatial characterization helps to distinguish and target geographical areas that are more likely to face certain types of agricultural development constraints (drought, soil erosion, pests and diseases, and isolation, for example), or those more or less suited to specific opportunities (such as dairy farming, irrigation investment, and improved extension services). Consistent and comparable characterization of economically-relevant location attributes is particularly important in evaluating the potential for spillovers and economies of scope and scale in a cross-country setting, e.g., in the scaling up and scaling out of beneficial knowledge and technologies across large geographical extents.¹ Most spatial datasets, even those of global or regional coverage, portray location attributes in highly spatially-disaggregated ways compared to the geopolitical units generally used in national policy and investment studies. Visually, at least, such data reveal patterns of spatial heterogeneity of land use, transportation networks, population density and other factors that have a direct bearing on development.

To illustrate a specific, if perhaps not typical, strategic use of regionally-derived, spatially-referenced data, Figure 1 portrays a *development domain* characterization for Eastern and Central Africa (ECA) (Omamo et al. 2007). Development domains are spatial constructs gaining currency, particularly in sub-Saharan Africa, through their incorporation into “evidence-based” approaches to the formulation of development strategies and policies, and to investment

¹ “Cross-country” can be interpreted in several ways. Some agencies invest in regional initiatives and assess the regional costs and benefits of investment alternatives, but always with an eye to national implications (e.g., agricultural research entities such as the CGIAR and ASARECA). Other institutions target investments at a national scale, but often wish to evaluate their portfolio of country investments through a consistent multi-country framework (e.g., most development donor and lending agencies). In yet other cases, enlightened countries may chose to develop their own investment strategies informed by potential interaction with other countries through trade, technology spillover, human and animal migration, epidemiological risk, and so on.

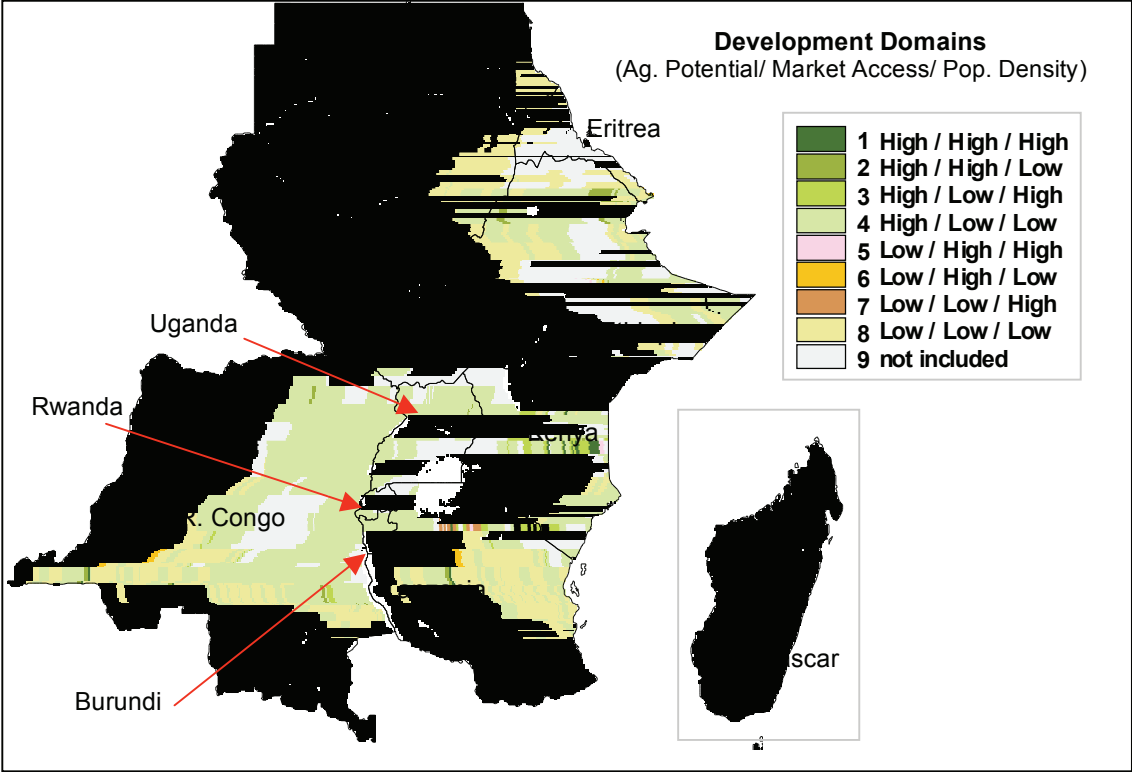
decision making.² Development domains are constructed by the intersection of three spatial variables; agricultural potential, market access and population density, using a geographic information system (GIS). It is argued that these domains and their geographic extents can be interpreted as representing distinct bundles of agricultural development constraints and opportunities. Domains offer a compact way of delineating relatively few bundles of development conditions on the one hand (only eight domain classes in the example), while exhibiting a relatively complex spatial pattern of the location, extent and degree of fragmentation of individual domains. Thus, while intuitively simple, the domain approach appears to capture some measure of the heterogeneity of agricultural development conditions known to exist across the ECA region. Furthermore, on the basis of (still limited) empirical evidence, hypotheses can be formulated about specific agricultural development constraints and strategic opportunities associated with each domain class. A partial summary table of such hypotheses for 4 of the 8 domains is presented as Table 1.

The map and the table provide a compact conceptual framework for addressing strategic agricultural development issues that analysts and policymakers have embraced. Using other information and spatial analysis tools, domains can be further characterized in terms of the numbers of people, cropland areas, shares of production, natural resources, etc. they comprise, thus helping scale notions of the potential costs and benefits of intervention.³ Taken together, such strategic information contributes to targeting and priority setting for subsequent, in-depth evaluation.

² At an operational level, institutions and initiatives currently incorporating the notion of development domains into their strategic targeting and evaluation processes in Africa include centres of the Consultative Group on International Agricultural Research (CGIAR), the Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA), the sub-Saharan African Challenge Program coordinated by the Forum for Agricultural Research in Africa (FARA) and the Comprehensive Africa Agriculture Development Program (CAADP) of the New Partnership for Africa's Development (NEPAD). And similar approaches are under consideration by the Alliance for a Green Revolution in Africa (AGRA).

³ In the Omamo et al. (2007) study, domains define the spatial analysis units for further economic evaluation of alternative growth strategies using a regional, agricultural sector model.

Figure 1.1 The Agricultural Development Domains of Eastern and Central Africa



(adapted from Omamo et al. 2007)

Table 1.1 Agricultural Development Priorities and Options within ECA Development Domains

Agricultural potential	Market access	Attributes/Priorities	Example Locations in ECA and Potential Agricultural Development Options	
			Population Density	
			HIGH	LOW
		<i>Greatest commercialization and diversification options</i>	<i>Example Locations:</i> Parts of central and western Kenya, Uganda's Lake Victoria Crescent, parts of central and southwestern & southeastern highlands of Ethiopia, parts of Rwanda & Burundi.	<i>Example Locations:</i> Isolated areas scattered throughout region
		<i>Productivity Growth</i>		
		<ul style="list-style-type: none"> • Agricultural research and extension systems 		
H		<ul style="list-style-type: none"> • Weed and pest control 		
I		<ul style="list-style-type: none"> • Soil and water management 	<ul style="list-style-type: none"> • <i>Options:</i> High input cereals (e.g., maize, rice, wheat) 	<ul style="list-style-type: none"> • <i>Options:</i> As for high population density plus more extensive high-value options, e.g., cotton, tea, oil crops, fruits
G		<ul style="list-style-type: none"> • Awareness raising, consensus building on biotechnology-related opportunities & risks 	<ul style="list-style-type: none"> - Perishable cash crops (e.g., vegetables, fruits, flowers, ornamentals) 	
H		<i>Market Improvement</i>		
		<ul style="list-style-type: none"> • Market intelligence (domestic, regional and international) 	<ul style="list-style-type: none"> - Intensive livestock (e.g., dairy, chicken, pig) 	
H		<i>Linkages with non-agriculture</i>	<ul style="list-style-type: none"> - Non-perishable cash crops (e.g., coffee, tea) 	
I		<i>More limited technology adoption and commercialization</i>		
G		<i>Productivity Growth</i>	<i>Example Locations:</i> Southwestern Uganda, parts of central and western Kenya, much of the Ethiopian highlands, northern Tanzania, Rwanda and Burundi.	<i>Example Locations:</i> Large areas of all countries: most of central DRC, southern Sudan, parts of central Uganda, Kenya and Tanzania, widely scattered areas in Ethiopia and Madagascar.
H		<ul style="list-style-type: none"> • Agricultural research and extension systems 		
L		<ul style="list-style-type: none"> • Weed and pest control 		
O		<ul style="list-style-type: none"> • Soil and water management 		
W		<ul style="list-style-type: none"> • Awareness raising, consensus building on biotechnology-related opportunities & risks 	<ul style="list-style-type: none"> - High input cereals (e.g., maize, rice, wheat) 	<ul style="list-style-type: none"> - Intensification in non-perishable crops—cereals, oilseeds, tea, coffee
		<i>Market Improvement</i>	<ul style="list-style-type: none"> - Non-perishable cash crops 	<ul style="list-style-type: none"> - Livestock intensification; improved grazing areas
		<ul style="list-style-type: none"> • Market development – i.e., infrastructure, market info systems, credit institutions, etc. 		
		<i>Linkages with non-agriculture</i>		
		<ul style="list-style-type: none"> • Storage, processing, distribution 		

Source: Adapted from Oramo et al. (2007)