

# FRAMEWORK FOR ASSESSING NATIONAL E-AGRICULTURE READINESS

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## Abstract

The Technical Centre for Agricultural and Rural Cooperation (CTA) has as its mission, to advance food and nutritional security, increase prosperity and encourage sound natural resource management in ACP countries. One of CTA's work areas is promoting the application of ICTs for agricultural value chain development, and for agriculture and rural development policy processes. As part of this work focus, the CTA sought to develop a generic e-Agriculture Readiness Assessment Framework (e-ARAF) to objectively assess the capability of a nation's agricultural sector to benefit from the uptake and usage of new ICTs.

This framework facilitates this assessment along the five core areas or pillars: (a) business environment; (b) governance (structure and guidelines); (c) human resource capability; (d) psychographics (culture and mindset); (e) ICT infrastructure.

The e-ARAF is based on the INFOCOMM Technologies Ltd e-Readiness Framework – one of the few e-readiness frameworks which gives significant holistic consideration to factors beyond issues of access to devices, software, connectivity and human capacity. The Framework gives attention complementarily to broader issues, including the business environment, sector governance and the ICT culture and mindset.

It is expected that the e-ARAF will be matured into an ACP-wide and/or Global index which will assist policy planners and national strategists to establish priorities for their local sector and facilitate effective investment into e-Agriculture. The tool is intended for use by governments, agriculture organisations, academics, policy makers, development partners, private sector entities, and others who seek to advance the Agriculture through the use of ICTs.

## Introduction

The Technical Centre for Agricultural and Rural Cooperation (CTA) was established in 1983 under the Lomé Convention between the African, Caribbean and Pacific (ACP) Group of States and the European Union (EU) Member States. Its

mission, as stated in its Strategic Plan, 2011-15, is to advance food and nutritional security, increase prosperity and encourage sound natural resource management in ACP countries.

In an effort to realise its vision, CTA in 2016 commissioned INFOCOMM Technologies (ICT) Ltd. to design an e-Agriculture Readiness Assessment Framework (e-ARAF). This company is located in Trinidad and Tobago, a member country of the African, Caribbean and Pacific (ACP) grouping.

## What is the Framework?

The e-Agriculture Readiness Framework (e-ARAF) is a tool for objectively assessing the capability of a nation's agricultural sector to benefit from the potential of ICT adoption. It seeks to assess the current level of sophistication of ICT use within the agriculture sector, and evaluates the sector's preparedness to use ICTs to achieve operational efficiency and to improve information management, dissemination and collaboration capacities.

This framework assesses a nation's agricultural sector stakeholders along five core areas or pillars as follows:

- Business Environment
- Governance (structure and guidelines)
- Human Resource Capability
- Psychographics (culture and mindset)
- ICT Infrastructure

The five core pillars of the derived e-ARAF are described as follows:

- *Business Environment*: This evaluates the national/international business environment in which the agriculture sector operates. This pillar looks into the nature of the sector's products/services, competition, markets, demographics, etc. The goal here is to describe specific factors that influence the sector as a whole. An assessment of the business environment will determine the desirability of additional ICT investments aimed at enhancing sector health.
- *ICT4Ag Structure and Guidelines*: This pillar evaluates the ICT, agro-food and resource management sector strategies, plans, rules, procedures guidelines, regulations and legislation; and whether or not they are formally defined by the state, business groups and NGOs concerned with the sector. This pillar also assesses the ability of sector administrators, ICT professionals and other stakeholders to successfully implement policies and monitor compliance within a structured environment, so as to achieve pre-defined desired outcomes. When real systems are well defined, they can be efficiently and effectively simulated using ICTs. On the contrary, adding ICTs to a chaotic environment inevitably adds to the chaos.
- *ICT4Ag Human Resources*: This evaluates the level of technology proficiency and expertise available to the sector. This pillar looks at the level of comfort,

proficiency and expertise in the use of ICTs to perform work-related tasks and how well-trained actors are in employing their ICT skills to benefit their work. Ultimately people and human resource capacity can be the factors which determine the ability of an organisation or sector to meet its strategic objectives. Due to the centrality of the people factor to the success or failure of ICT implementation initiatives, gaps and challenges with respect to HR capacity must be determined. Identification of these gaps will help to establish any need for ICT training as well as to assess the alignment of skills possessed vs. skills required in the sector.

- *ICT4Ag Psychographics*: This refers to the importance with which ICTs and e-Agriculture interventions are viewed within the agriculture sector and within the national environment. The Psychographics pillar assesses the ICT innovation mind-set and culture. This pillar essentially assesses how a sector's stakeholders think about the importance of technology use, their willingness to adopt new ICT enabled business models, working behaviours and innovations, and their ability to adapt to changing technology and agro-food business realities. This is the single greatest determinant of adoption and use of ICTs for agriculture improvement as it reflects the attitude of sector leadership on the issue.
- *Infrastructure*: The Infrastructure pillar represents a view of the ICT infrastructures available to the target agriculture sector. This pillar specifically assesses the Sector's hardware, applications, connectivity and physical facilities. In order to leverage ICTs for the advancement of agriculture, individuals, businesses, state organisations and NGOs in the Sector must have access to the appropriate infrastructure which can enable them to quickly access critical information, collaborate with peers and customers, as well as facilitate the performance of specialised technical work-related tasks. Beyond tools at the individual level, infrastructure must be in-place to facilitate organisational ICT administration as well as coordination among actors as appropriate. In the current technology environment, such infrastructure is not necessarily "on-premise", or hosted within the bounds of the organisation, but is increasingly publicly available via "cloud" services — such as those that drive social media and mobile applications. The current technology environment also includes emerging, Artificial Intelligence (AI), Machine Learning, Big Data, Drone technologies, Geographical Information Systems, Remote Sensing technologies and the Internet of Things (IoT).

The e-ARAF is based on the INFOCOMM Technologies Ltd e-Readiness Framework. The INFOCOMM model (an overview of which is given in *Table 1 below*) was found to be one of the few e-readiness frameworks which gives significant holistic consideration to factors beyond issues of access to devices, software, connectivity and the human capacity. The Framework gives attention complementarily to broader issues, including the business environment, sector governance and the existence of visible ICT champions.

**Table 1: Summary of ICT Ltd e-Readiness Framework Core Pillars**

ICT Ltd. e-Readiness Framework Pillars	Original Pillar Definition
Business Environment	<p>This pillar assesses the national business environment for the value chain and also describes specific factors that influence the operating environment for actors within value chain nodes. This assessment focuses on the items that impact the return on increased investment in ICT within the sector.</p> <p>An assessment of the business environment will determine the desirability of additional ICT investments aimed at enhancing value chain health, and effective information flows along the chain.</p>
Governance	<p>Ineffective regulatory systems together with unclear or incoherently articulated sector vision and strategy do not facilitate successful implementation of ICTs in any sector. As such, the Governance pillar of the INFOCOMM e-Readiness framework seeks to assess a sector's strategies, plans, rules, procedures and guidelines, and whether they are formally defined at the country/sector/business level. This pillar also assesses the ability of sector administrators, ICT professionals and other stakeholders to successfully implement policies and monitor compliance, within a structured environment, so as to achieve pre-defined desired outcomes.</p> <p>When real systems are well defined, they can be efficiently and effectively simulated using ICTs. On the contrary, adding ICTs to a chaotic environment inevitably adds to the chaos.</p>
Human Resource Capacity	<p>This evaluates the level of technology proficiency and expertise available to the value chain in focus. This category looks at the level of comfort, proficiency and expertise in the use of ICTs to perform work related tasks and how well trained value chain players are in employing their ICT skills to benefit their work in the value chain.</p> <p>At the end of the day, people and human resource capacity can be the ultimate factors which determine the ability of an organisation, value chain or sector to meet its strategic objectives. With regard to the sector's ability to leverage ICTs, assessing the human resource component is a key consideration to ensure that stakeholders have the necessary knowledge, skills, experience and aptitude needed to leverage the use of ICTs to improve the health of their particular chain.</p> <p>Due to the centrality of the people factor to the success or failure of ICT implementation initiatives, gaps and challenges with respect to HR capacity must be determined. Identification of these gaps will help to establish any need for ICT training as well as to assess the alignment of skills possessed vs. skills required at each node of the value chain.</p>
Psychographics	<p>The Psychographics pillar analysis assesses the ICT innovation mind-set and culture of the value chain. This pillar essentially assesses how a sector's stakeholders think about technology use, their willingness to adopt new ICT enabled business models, working behaviours and innovations, and their ability to adapt to changing technology and business realities. This is the single greatest determinant of adoption and use of ICTs for business improvement, as it reflects the attitude of sector leadership on the issue.</p>
Infrastructure	<p>The Infrastructure pillar represents a view of the ICT hardware, software infrastructure, telecom infrastructures and e-services that are available for use by the target value chain. In order to leverage ICTs for value chain enhancement, individuals within the chain at the various nodes must have access to the appropriate infrastructure. Infrastructure refers to the required equipment, devices, connectivity and software which can enable them to quickly access critical information, collaborate with peers and customers as well as facilitate the performance of specialised technical work-related tasks.</p>

	<p>Beyond tools at the individual level, infrastructure must be in-place to facilitate organisational ICT administration as well as value chain coordination among nodes as appropriate. In the current technology environment, such infrastructure is not necessarily “on-premise”, or hosted within the bounds of the organisation, but is increasingly publicly available via “cloud” services - such as those that drive social media.</p>
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Further, it is the only holistic e-readiness framework which is found in the literature to have been successfully applied to entire agriculture value chains within the agro-food sector, anywhere in the world<sup>1</sup>.

## Why the Framework?

One of CTA’s work areas is promoting the application of information and communication technologies (ICTs) for agricultural value chains development, and for agriculture and rural development (ARD) policy processes. As part of this work focus, the CTA is sought to develop a generic e-Agriculture Readiness Assessment Framework (e-ARAF) that will be used to objectively assess the capability of a nation’s agricultural sector to benefit from the uptake and usage of new ICTs.

The intention is to mature this e-ARAF into a tool that can be used to assess the agriculture sector globally. Eventually this tool will be deployed as an online service that major public and private sector stakeholders in the agriculture and related sectors can use to produce assessments and insights into a nation’s or region’s sector and inform agriculture policy, strategy and investments. This initiative is therefore a first step towards the achievement of a larger goal of arriving at a global e-agriculture readiness index.

## The Process

The framework development process began with a comprehensive desk study. This study set the landscape for best practices in the formulation of e-readiness frameworks for assessing economic sectors, including agriculture; and to understanding the key ICTs, agricultural and rural development factors/indicators that must be assessed by the framework.

The focus was on the review and analysis of the following frameworks among others:

- *Global ICT Readiness Frameworks and other Global Indices* particularly;
  - UN e-Government Survey [in support of sustainable development].
  - Global Information Technology Report - Networked Readiness Index (NRI).

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<sup>1</sup> <http://www.cta.int/images/Regional-synthesis-of-ICT-uptake-and-usage-in-agricultural-value-chains-in-the-Caribbean.-FINAL-Submitted-15-Oct-2014.pdf>.

- *National Level e-Readiness Studies and Frameworks* of various sectors. These included the following:
  - E-Readiness Assessment of Seven Higher Education Institutions in Ghana.
  - Assessment e-Health Readiness for Rural South African Areas.
- *ICTs Readiness Studies of the Agriculture Sector*:
  - e-Readiness in Agriculture Extension System.
  - Regional Synthesis Report Strengthening ICTs in Value Chains in the Caribbean.

These indices and assessment frameworks were formulated to assess the specific phenomena they intended to measure. One finding was that the general guidelines used to determine the specific indicators of each assessment model were not always communicated in the methodologies of the studied frameworks, but overall they can be categorised as follows:

- **Relevance:** Indicators are chosen or developed to provide insight into country situations in the context of the project goals.
- **Distinctiveness:** Each indicator focuses on a different aspect of the issue being explored, unless reinforcement is required.
- **Balance:** Indicators within each dimension exhibit coverage of different issues.
- **Contextual Sensitivity:** Indicators capture different country situations (for example, wealth, size) and, where appropriate, indicators are normalised so as to obtain as close to an objective basis for comparison of countries.

Having reviewed the e-readiness frameworks selected for the desk study, five themes emerged as key determinants of e-readiness. These are set out in the table below along with the Frameworks/Indices in which they have been used.

**Table 2: Summary of the Main Themes Identified During the Desk Study of e-Readiness Frameworks**

<b>Key Determinants of e-Readiness</b>	<b>Frameworks Incorporating Determinant</b>
Technology/ Infrastructure	<ul style="list-style-type: none"> <li>• NRI</li> <li>• UN e-Gov. Survey 2016.</li> <li>• e-Readiness Assessment of Seven Higher Educational Institutions in Ghana.</li> <li>• e-Readiness in Agricultural Extension System and ICT Ltd. e-Readiness Framework.</li> </ul>
Skills/Human Resource Capacity	<ul style="list-style-type: none"> <li>• NRI</li> <li>• UN e-Gov. Survey 2016.</li> <li>• e-Readiness Assessment of Seven Higher Educational Institutions in Ghana.</li> <li>• e-Health Readiness for Rural South African Areas.</li> <li>• e-Readiness in Agricultural Extension System and ICT Ltd. e-Readiness Framework.</li> </ul>
Business Environment	<ul style="list-style-type: none"> <li>• NRI</li> <li>• e-Health Readiness for Rural South African Areas.</li> <li>• ICT Ltd. e-Readiness Framework.</li> </ul>

Political/Regulatory Environment/ Governance	<ul style="list-style-type: none"> <li>• NRI</li> <li>• e-Readiness Assessment of Seven Higher Educational Institutions in Ghana.</li> <li>• e-Health Readiness for Rural South African Areas.</li> <li>• ICT Ltd. e-Readiness Framework.</li> </ul>
Disposition Towards Technology/ Innovation Capacity	<ul style="list-style-type: none"> <li>• NRI</li> <li>• UN e-Gov. Survey 2016.</li> <li>• e-Readiness Assessment of Seven Higher Educational Institutions in Ghana.</li> <li>• e-Health Readiness for Rural South African Areas.</li> <li>• e-Readiness in Agricultural Extension System and ICT Ltd. e-Readiness Framework.</li> </ul>

The studied frameworks and indices corroborated each other with regard to the core factors that contribute to an organisation’s, sector’s or nation’s e-Readiness. The core factors identified were:

- Technology/Infrastructure (networks, hardware, software/applications, etc.)
- Skills/Human Resource Capacity
- Business Environment
- Political/Regulatory Environment/Governance
- Disposition towards Technology/Innovation Capacity

Table 2 above shows that the ICT Ltd. e-Readiness Framework was the only one of the studies set that addressed all the core factors. In addition, it was the only one that had been successfully applied and validated in the agricultural space. Consequently, this framework, summarised in Table 1, was adapted and amplified to develop an e-ARAF with particular reference to agriculture.

## **Adapting the ICT Ltd. e-Readiness Framework to the e-ARAF**

Adapting the base ICT framework to meet the specific needs of the project necessarily meant defining the scope of the agriculture sector that the framework would assess. The e-ARAF recognises the CTA’s use of the term “agriculture” in the broadest sense to include four key segments i.e.:

- Crops - Any cultivated plant, fungus or alga that is harvested for food, fibre, edible oil, livestock fodder, biofuel, medicine, or other uses. With respect to plants, these could be annual or perennial (depending on their period of life) and shrubs or trees (depending on their size).
- Fisheries - The harvesting of wild fish (in marine or inland waters) or raising fish through fish farming or aquaculture or mariculture.
- Forestry - The science and craft of creating, managing, using, conserving and repairing forests and associated resources to meet desired goals, needs and values for human and environmental benefits.
- Livestock - Animals, generally domesticated, to produce commodities, such as food, fibre and labour. They can be birds (poultry) and mammals (large ruminants such as cattle, and small ruminants such as sheep and goats).

Furthermore, a review of existing Global Indices on a range of topics revealed the importance of defining upfront the specific issues an index is to be optimised to measure. In this regard, the space of concern for the e-ARAF was taken as the CTA's strategic focus areas, which include:

- Food security
- Prosperity
- Sound natural resource management

As a consequence, the framework is optimised to access *Agro-food* outputs which contribute to food security and not to non-food activities that do not directly contribute to the main objective of food security.

## **For whom is the Framework Intended?**

The tool is intended for use by governments, agriculture organisations, academics, policy makers, development partners, private sector entities, and other bodies/individuals who may wish to make investments in a country's agriculture sector. This initiative is therefore a first step toward the achievement of the larger vision of arriving at a global e-agriculture readiness index.

Even more broadly speaking, the framework is designed for those interested in the practicality and holistic accuracy of the output of a model to truly indicate e-readiness in Agriculture. Thus it is for persons who are serious about understanding and advancing the Agriculture situation in a sector or country through the use/incorporation of ICT-based methods, models, equipment and digital transformation thinking.

## **Who Can Access It?**

The Framework can be accessed via the CTA. The Specific contact will be Dr. Ben Addom (addom@cta.int).

## **Is it Appropriate for Particular Areas of the World?**

Global indices/assessments are recognised by the respective domain experts as having identified key factors and concerns for advancing the sectors they pertain to. As such, state sector strategists and policy makers around the world use established indices like the WEF's Network Readiness and Global Competitiveness indices to snapshot a country's current state, identify key areas for improvement and as input to the formulation of national and sector policies and strategies. Countries that have limited national data gathering capabilities, especially relating to economic and technology issues are heavily dependent on these indices as proxy data for decision making and resource allocation.



These indices also influence private sector investments in their associated sectors. Country assessments do inform business decisions; whether or not to invest in a country and which areas/sectors to invest in. Investment promotion agencies and governments are also known to highlight their country’s rankings in order to attract foreign investors and promote certain sectors as targets for new business opportunity by entrepreneurs.

It is expected that once the e-Agriculture Readiness Framework is matured into an ACP-wide and/or Global index, it will have a similar impact on the agriculture sectors of countries within the ambit of the study. Such an index will assist policy planners and national strategists to establish priorities for their local sector and facilitate effective investment into e-Agriculture.

## Maturing the e-ARAF

It should be noted that even when the most appropriate indicators are selected, it may still be challenging to objectively assess many different countries that vary widely in their stage of development, size/structure of economy and geography. This would particularly be the case for planners and policy makers in the target countries who may wish to use the assessments as input into their decision making processes. To mitigate this issue, most of the assessment frameworks reviewed attempt to categorise countries into different groupings that may be based on core economic base/activity, geography, GNI per capita, etc. Based upon the grouping criteria, the frameworks would outline which pillars and/or sub-indices are more important, relevant or crucial to the issue at hand. The frameworks may also outline broad guidelines for transitioning from one grouping to another. This is a guideline for future work on maturing the generic eARAF into an ACP-Wide/Global index.

**Table 3: Sample of e-Readiness Framework Core Pillars (eARAF) Pillars, Indicators and Sample Questions**

<p>Business Environment: This evaluates the national/international business environment in which the agriculture sector operates. This category looks into the nature of the sector's products/services, competition, markets, demographics etc. The goal here is to describe specific factors that influence the sector as a whole. An assessment of the business environment will determine the desirability of additional ICT investments aimed at enhancing sector health.</p>		
Indicator	Description	Sample Questions <sup>2</sup>
<p>Level of technology adoption by collaborators and competitors.</p>	<p>This measure speaks to the level of ICT capacity, usage and savvy of stakeholders external to the national agriculture sector. These external stakeholders include:</p> <ul style="list-style-type: none"> <li>• Export markets</li> <li>• Foreign suppliers</li> <li>• Competitors etc.</li> </ul>	<ul style="list-style-type: none"> <li>• What kind of communication modalities do your competitors/ collaborators use? (phone calls, email, website, e-marketplace, social media, etc.).</li> <li>• What kind of payment technologies do your competitors offer to their customers?</li> </ul>

<sup>2</sup> It should be noted that the questions in this column are indicative only. They are not intended to be exhaustive or comprehensive but are only provided as a starting point for discussion.

<p>Existence of online exchanges for goods &amp; services or ICT service providers who service the sector.</p>	<p>If these external stakeholders have deployed ICTs within their operations, a sector investment in ICTs may facilitate improved collaboration or enhanced competitive capacity.</p> <ul style="list-style-type: none"> <li>• This is a measure of the availability, reach, quality and impact of third party market intermediaries, on which sector actors can rely to facilitate the transition into on-line marketplace activity.</li> <li>• These intermediaries include online security, website/mobile app developer services etc. The more that such actors and capacities are in place, the greater the return on additional ICT resource investment can be realised.</li> </ul>	<ul style="list-style-type: none"> <li>• What kind of technologies do your collaborators (e.g. hotels) use to enable procurement and inventory management of agro-products?</li> <li>• Are there any ICT service providers that service the sector (i.e. providers of websites, e-marketplaces, mobile apps, etc.)?</li> <li>• What online exchanges currently exist for or are available to the agro-sector?</li> <li>• Who are the VAS providers in the country?</li> </ul>
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ICT4Ag Human Resources: This evaluates the level of technology proficiency and expertise available to the sector. This category looks at the level of comfort, proficiency and expertise in the use of ICTs to perform work related tasks and how well trained actors are in employing their ICT skills to benefit their work. At the end of the day, people and human resource capacity can be the ultimate factors which determine the ability of an organisation or sector to meet its strategic objectives. Due to the centrality of the people factor to the success or failure of ICT implementation initiatives, gaps and challenges with respect to HR capacity must be determined. Identification of these gaps will help to establish any need for ICT training as well as to assess the alignment of skills possessed vs. skills required in the sector.

Indicator	Description	Sample Questions <sup>3</sup>
<p>ICT capacity of non-ICT staff within the agricultural sector.</p>	<ul style="list-style-type: none"> <li>• This indicator measures concepts of both Digital Literacy and Information Literacy. The main components of this indicator are:</li> <li>• Digital Literacy is the ability to use information and communication technologies to find, evaluate, create, and communicate information, requiring both cognitive and technical skills<sup>4</sup>.</li> <li>• Information literacy is a crucial skill in the pursuit of knowledge. It involves recognising when information is needed and being able to efficiently locate, accurately evaluate, effectively use, and clearly communicate information in various formats<sup>5</sup>.</li> </ul>	<ul style="list-style-type: none"> <li>• What is the level of digital literacy of agriculture sector employees? (digital literacy includes basic computer literacy, content production skills, web 2.0 usage and skills, etc.).</li> <li>• What is the perceived rate of Information literacy of agriculture sector employees?</li> <li>• Does the agriculture sector of the country have staffs that are in-tune with the new digital world?</li> </ul>
<p>Availability of quality Technical IT personnel/ institutions in</p>	<ul style="list-style-type: none"> <li>• Technical ICT personnel are those trained and skilled in the development, configuration, repair and/or deployment of ICT hardware</li> </ul>	<ul style="list-style-type: none"> <li>• Do agriculture sector businesses and institutions generally employ Technical ICT skills personnel and services?</li> </ul>

<sup>3</sup> It should be noted that the questions in this column are indicative only. They are not intended to be exhaustive or comprehensive but are only provided as a starting point for discussion.

<sup>4</sup> Sep 14, 2012 Digital Literacy Definition | ALA Connect [connect.ala.org/node/181197](http://connect.ala.org/node/181197).

<sup>5</sup> Information Literacy Defined, Library - Wesleyan University [www.wesleyan.edu/libr/inforyou/infolitdefined.html](http://www.wesleyan.edu/libr/inforyou/infolitdefined.html).

<p>the agricultural sector.</p> <p>Availability of quality Strategic ICT personnel/ institutions in the agricultural sector.</p>	<p>and software systems. An e-ready agriculture sector will have such skilled personnel available within the sector in sufficient quantity to ensure the proper functioning and maintenance of ICT infrastructure at a reasonable cost.</p> <ul style="list-style-type: none"> <li>• Strategic ICT personnel are those trained and skilled in the strategic management and use of ICTs to meet organisation and sector objectives. Such personnel are not concerned with the development, configuration and deployment of systems, but are able to formulate strategy, policy and management systems that will allow technology deployments to meet sector goals and efficiencies.</li> </ul>	<ul style="list-style-type: none"> <li>• Are the technical ICT personnel and services affordable to agriculture sector businesses and institutions?</li> <li>• Does the personnel (staffing) system support ICT integration within the sector? – personnel such as programmers, media production staff, web page designers, digital technicians.</li> <li>• Do agriculture sector businesses and state sector institutions generally have personnel with quality strategic ICT knowledge and skills-sets?</li> <li>• Are the quality strategic ICT personnel and services affordable to agriculture sector businesses and institutions?</li> </ul>
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Atiba Phillips is a senior ICT strategist with 15 years' experience working primarily in the Americas for clients such as the EU, UNECLAC, CTA, IDB, OECS, CARICOM, CARDI, CARIRI and the Government of Trinidad & Tobago (GoRTT). He has a track record of designing and implementing regional, national and sector development programmes in areas such as e-business, e-commerce, broadband, e-agriculture, ICT & Disaster.



James Antoine has expertise in the development of ICT4D strategies in Caribbean economies. He has performed on several multi-domestic projects and consultancies in roles such as e-Commerce Specialist, ICT4D Specialist, ICT Strategy Expert, Trainer and Technical Consultant.



Arlington Chesney is an expert in agricultural policy, strategy, program and project development and implementation with 40 years' experience in Guyana, the CARIFORUM region, and Latin America. Dr. Chesney has held senior executive positions in Regional and hemispheric organisations, such as, Caribbean Food Corporation (CFC), Caribbean Agriculture Research and Development Institute (CARDI), and Inter-American Institute for Corporation on Agriculture, (IICA).



A development professional operating in the Caribbean "ICT for Development (ICT4D)" space, Kelly-Ann has performed on regional consultancies. She has authored sections of IDB/CARIRI's "Improving the Performance of SMEs through ICTs" SME reports, CARDI's "Strengthening ICT Usage in Agriculture Value Chains in the Caribbean" regional study and CTA's "Framework for Assessing e-Agriculture Readiness in ACP Countries", amongst others. E-mail: [kelly-annphillips@ict.co.tt](mailto:kelly-annphillips@ict.co.tt)