

Strategic Internationalization Starts at Home: The Case of Capacity Creation in the Democratic Republic of Congo (DRC)

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The 2016 outbursts of nationalism have left globalization moribund. We wonder how the creation of capacity for transportation infrastructure, leveraging internationalization, affects economic development. We nurture our reflections through the field observations of a US expert whose expertise was requested by DRC leaders. We find that the lack of capacity to perform infrastructure development can be addressed by Western and local institutions, generating greater internationalization. This paper explores the needs of programs and methods through which Western Universities and local organizations can provide such capacity, even in one of the most challenging business environments on Earth.

INTRODUCTION

One of the major hurdles impacting the ability to install and improve transportation infrastructure in Sub-Saharan Africa is the desperate need for an internal capacity to perform related tasks among the local population. Such skills as civil and industrial engineering, project and financial management and pertinent operating expertise are essential components of such initiatives. The need to provide the nations of sub-Saharan Africa with sufficient knowledge and capacity to self-select, self-direct and self-execute projects to meet their desperate need for infrastructure is a paramount duty of the developed world.

Through visits to the Democratic Republic of the Congo, a study on current conditions and capabilities in infrastructure development was performed. During these visits and in conjunction with a series of telephone conversations, extensive discussions on the topic were held with senior national and provincial government officials, as well as local university leaders and business executives. The concerns of inadequate capacity were clearly voiced by the DRC leaders.

The paper presents current conditions, explores the needs for enhanced capacity and recommends some approaches through which Western Universities and development entities can assist in providing such capacity. What specific aspects of project development require immediate attention in such information transfers?

As Western interests apply resources towards delivery of basic tools, laboratories and coursework to the universities and institutes of the sub-Saharan nations, long-term results and benefits will be achieved. Including pertinent government ministries and local businesses in such programs would deliver such benefits immediately through applications into current project needs. Together, such initiatives would generate immediate economic benefits to these nations, relieve civil unrest and begin the process of providing proper training for the local student bodies to become the leaders of the future in these areas of the world.

LITERATURE REVIEW

The Strategic Importance of Africa

While the many international business studies have dealt with emerging markets, such as China and India, it has become clear that Africa is now a vibrant continent and a source of great strategic insights (Babarinde, 2009; Kruger & Strauss, 2015; McNamee, Boer, & Pearson, 2015; Oguji & Owusu, 2016; Teagarden, 2009). In this African context with many actors; i.e., institutions, firms, universities, and organizations that only add complexity to sense-making (Gioia & Chittipeddi, 1991; Gioia, Corley, & Hamilton, 2013) we will define globalization and internationalization.

Globalization vs. Internationalization

Whereas the terms globalization and internationalization are commonly used interchangeably, these terms are strikingly different and can lead to a mismatch between the context and the strategy (Guillotin & Mangematin, 2015). In the general context, globalization is “the process of increasing convergence, interdependence of economies, and liberalization of trade and markets” (Thune & Welle-Strand, 2005, p. 595). On the other hand, internationalization can be defined as a learning process (Johanson & Vahlne, 1977, 2009) or as the response (strategy) to globalization which is considered as the catalyst or phenomenon (Knight, 1999, 2003). The literature is divided on the degree to which globalization produces convergence and that debate has been ongoing for years. Understanding this dynamic debate is important in order to formulate the right strategy.

Leveraging Internationalization Strategically

If internationalization can be considered a learning process, it can be used strategically to expand outside the home market (Johansson & Vahlne, 1990) or to internationalize at home by infusing internationalization into strategic processes, such as Research and Development (Criscuolo, 2009). This is what some scholars have called reverse internationalization (Chin, Liu, & Yang, 2016) and it gives us great insights when we triangulate (Burton & Obel, 2011) and go back and forth between literature and data.

DATA AND METHODOLOGY

The data were gathered by a US expert at the request of the DRC government. This US expert (aka the embedded researcher) teamed up with another researcher (scholarly academic) in order to analyze and present the data of this study. The combined professional experience in corporate and academic environments of the researchers spans sixty years and spreads across Europe, Africa, and the US. The data and methodology that follow are organized in three sections: research design, data collection, and data analysis.

Research Design

In order to explore how the creation of capacity for transportation infrastructure, leveraging internationalization, affect economic development, we used a qualitative approach and designed our research model around a case study (Eisenhardt, 1989; Eisenhardt & Graebner, 2007) as primary data research sources. “Qualitative research is uniquely suited to ‘opening the black box’ of organizational

processes, the ‘how’, ‘who’ and ‘why’ of individual and collective organized action as it unfolds over time in context” (Doz, 2011, p. 583). This approach is used by qualitative researchers who seek to explain strategies in order for their scholarship to have an impact (Pettigrew, 2011, 2013). To this end, a single researcher embedded in the field used a rigorous and inductive approach (Eisenhardt, 1989) and treated each meeting like a conversation (Yin, 2009) organized around themes associated with strategic decisions in an international context. This embedded researcher had a privileged access to informants and strategic decision- makers. As secondary data research sources, we used academic journals, books, websites, conference proceedings, strategic plans, professional reports, and specialized newspaper articles.

Data Collection

The Embedded Researcher

The information was gathered primarily in the DRC by an embedded researcher through more than 52 official meetings with key informants at the managerial and executive levels of government, NGOs, universities, and firms. These meetings took place over a period of 22 days in the country (two trips in 2015) and were complemented by informal conversations over dinner. Additional phone conversations took place after both trips and until April 2016.

Ministers, university and institute presidents and professors, as well as local businessmen including CEOs participated in these meetings. Their names are not shared in study in order to respect the anonymity of these key informants. However, more details on the organizations and firms can be provided upon request. All data used in the paper was sourced from cited documents and expert observations. Much of the proposed activities is sourced from executive- level work in developing and managing projects and major capital plans.

The Role of the Embedded Researcher: Why “They” Met with “Him”

In 2015, a very senior government representative of the Democratic Republic of the Congo requested assistance from Western universities to address the known absence of internal capacity to address the infrastructure needs of his nation. The assistance of a US research university was sought due to its extensive experience and established reputation in the arena of “Dirt and Gravel Road” management and highway operation. In April 2015, the embedded researcher was approached by the Director of Institute and asked to consider a trip to the Democratic Republic of the Congo on behalf of the University. The latter’s assistance was requested due to his role as an Adjunct Visiting Scholar and his decades of experience in directing all modes of transportation. He was advised that he would be the sole representative of the US research University for establishing relationships with universities in the Congo to arrange for the sharing information and assistance in building civil engineering and project management programs.

During his visit, interest in the US University’s capabilities in agriculture management and development as well as hydroelectric structure design was expressed, as well. Throughout his visit, he was accompanied by representatives of the very senior government representative’s office, who arranged all meetings with government and university officials. Due to the particular interest in his specialty, his sessions with ministers and university leadership addressed their interest in building capacity to instruct students in civil engineering and project management and financial matters, as well as to enhance their ability to create new professor positions in these areas. In addition, he was asked to discuss the topics with representatives of several local corporations and the local Chambers of Commerce (Federations of Commerce in Congo or FEKs). He was also introduced to persons representing the Howard G. Buffett Foundation that is constructing hydroelectric plants in eastern Congo as well as persons creating agricultural centers throughout the nation to provide fertilizer and agricultural training to Congolese hoping to become farmers. Throughout his conversations, the embedded researcher presented the University as a resource that might be able to assist in information sharing efforts, presuming that funding for such initiatives could be obtained. He met with USAID, World Bank and IMF representatives towards the materialization of such funding.

Data Analysis

Our data were analyzed using a rigorous approach (Bazeley & Jackson, 2013), which is consistent with a case study analysis. Furthermore, our data were interpreted while comparing them with evidence in the literature (Huff, 2008; Yin, 2009). We “analyzed the interactions between theory and empirical evidence” (Huff, 2008, p. 181) and believe that the data from our case reflect certain patterns (Miles & Huberman, 1994).

RESULTS AND DISCUSSION

This section of our study is organized in two parts: definitions and practical implications.

Definitions

Capacity - Capacity is defined as the facility or power to produce, perform, or deploy. (Merriam-Webster) The United Nations Development Programme (UNDP) sees capacity development as the process through which individuals, organizations and societies obtain, strengthen and maintain the capabilities to set and achieve their own development objectives over time (Murphy, 2006). In the case of the developing nations of Africa, such as the Republic of Cameroon and the Democratic Republic of the Congo (DRC), the need to develop capacity in the field of infrastructure development is clearly recognized by the nations’ governments, as well as all relevant development agencies of the world. Our study focuses on the DRC.

In addressing this need, it is essential that intelligence on infrastructure development functions be shared not only with government agencies and ministry employees responsible for such activities, but also with the upcoming leaders of the nation within the university environment – providing appropriate instruction on development methods and issues to the faculty and students to allow continuous expansion of such knowledge building.

Infrastructure - Infrastructure is the basic equipment and structures (such as roads and bridges) that are needed for a country, region, or organization to function properly. The system of public works of a country, state, or region and the resources (as personnel, buildings, or equipment) required for an activity comprise the infrastructure. (Merriam-Webster) Infrastructure relates to the transportation, energy and educational framework required for a nation to operate effectively. The development of infrastructure requires the ability to define required systems, design those systems, install those systems and operate and maintain those systems. Such planning, design and operation tasks must be established before any effective, long-lasting development can occur. A major feature of such efforts is the application of appropriate levels of project management, project performance reporting and operational management systems needed to install and operate the underlying assets in the most efficient, cost-effective manner.

Practical Implications

Sub-Saharan Africa Population

The population of Sub-Saharan African is approximately 973 Million people. 37% of the population reside in urban areas in this region.¹ By 2035, the number of Africans joining the working age population (ages 15–64) will exceed that from the rest of the world combined. This trend has significant implications for both the region and the global economy (IMF, 2015).

Sub-Saharan Africa Transport Infrastructure

In most African countries, particularly the lower-income countries, infrastructure is a major constraint on doing business, and is found to depress firm productivity by around 40 percent. For most countries, the negative impact of deficient infrastructure is at least as large as that associated with corruption, crime, financial market and red tape constraints (Foster & Briceño-Garmendia, 2008).

Africa’s road density is sparse when viewed against the vastness of the continent. As a result, only one-third of Africans living in rural areas are within two kilometers of an all-season road, compared with two-thirds of the population in other developing region (Foster & Briceño-Garmendia, 2008). In light of

current conditions, some reallocation of resources from investment to maintenance may be warranted, particularly in low income countries that show particularly low levels of maintenance expenditure. The clearest example of this is the roads sector, where many countries fail to cover basic maintenance and rehabilitation needs, and thus find themselves on a downward spiral with respect to road quality (ibid).

A significant share of Africa's rail corridors have recently been awarded as concessions to the private sector, and further concessions are planned. While there is some evidence that concessions have helped to improve the commercial and technical performance of the railways, the associated traffic volumes have not produced the revenues needed to fully finance track rehabilitation and renewal of rolling stock. As a result, most concessions have undergone major renegotiation episodes. A common problem is the imposition of unfunded social obligations to provide passenger services. Greater realism is therefore needed in the design of private contract structures for this sector (Foster & Briceño-Garmendia, 2008).

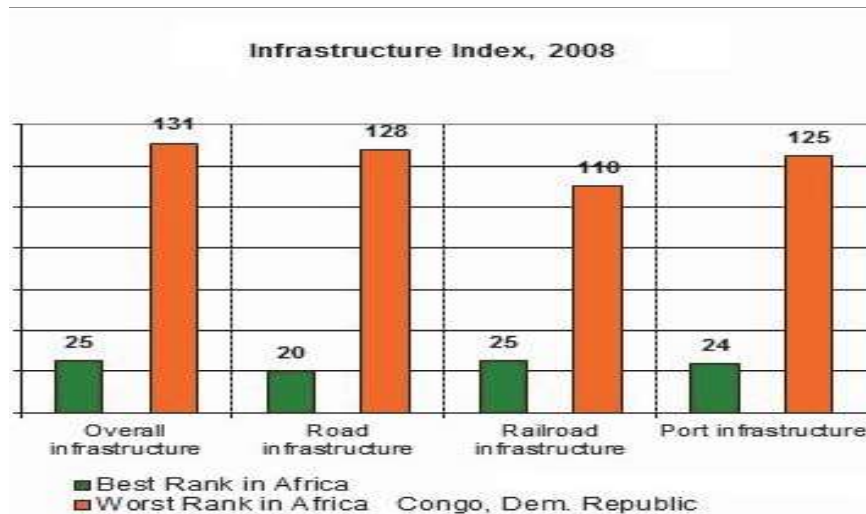
Addressing the infrastructure gap remains critical to allow new higher-productivity sectors to develop, generate jobs for the rapidly growing young population, and foster integration into global value chains. In scaling up investment to address infrastructure bottlenecks, though, countries will have to remain mindful of the need to preserve debt sustainability. Infrastructure appears as the most important impediment to trade for the region. In fact, bringing the quality of infrastructure to the average level observed elsewhere in the world would help enhance sub-Saharan African trade by as much as 42 percent, as this would substantially lower the cost of cross-border movements of goods (IMF, 2015).

Sub-Saharan Africa Financial Condition

Growth in Sub-Saharan Africa is expected at 3¾ percent for 2015 and forecasted to be 4¼ percent in 2016. Three factors have driven the growth of the region in the past decade - much improved business and macroeconomic environment, high commodity prices, and highly accommodative global financial conditions. The strength of growth is currently weaker than in recent years due to falling commodity prices. In most low-income countries, such as the Democratic Republic of the Congo (DRC), growth is holding up, as ongoing infrastructure investment efforts continue, and private consumption remains strong. However, the region's eight oil-exporting countries, including Cameroon, conversely, are being hit hard by the continued weakness in the pricing of oil.²

An assessment of the DRC infrastructure by the African Development Fund in 2013 found that the major portion of the road network is not operational with only 2% of the national network paved and 11% of the rural feeder road network in good or acceptable condition (AFDB, 2013). The rail network is barely operational, depriving the country of a key element of a multi-modal system. The Congo River and its tributaries offer potential for a natural and green transport system, but the existing network can only be used by day due to the lack of maintenance and marking of waterways (rivers and lakes). Lastly, the institutional arrangements and capacity to provide high quality maintenance and service delivery are weak. The figure below underscores DRC's low ranking in Africa in terms of infrastructure endowment (ibid).

FIGURE 1
DRC INFRASTRUCTURE INDEX 2008

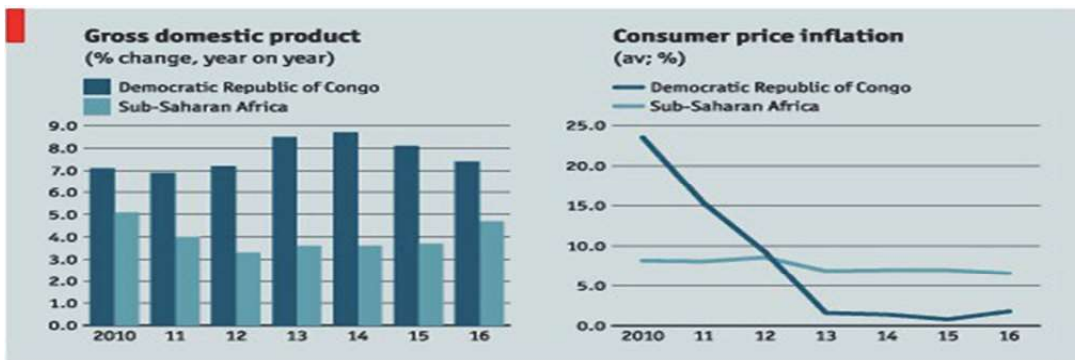


Source: AfDB's Statistics Department using 2011 WEF Data (AFDB, 2013)

DRC Financial Climate

In recent years, the DRC has enjoyed improved financial conditions thanks to a relatively stable government and strengthening position in financial management. They have experienced strong growth in recent years as well, with their 8+% growth being one of the highest rates in Africa.

FIGURE 2
DRC FINANCIAL STATISTICS

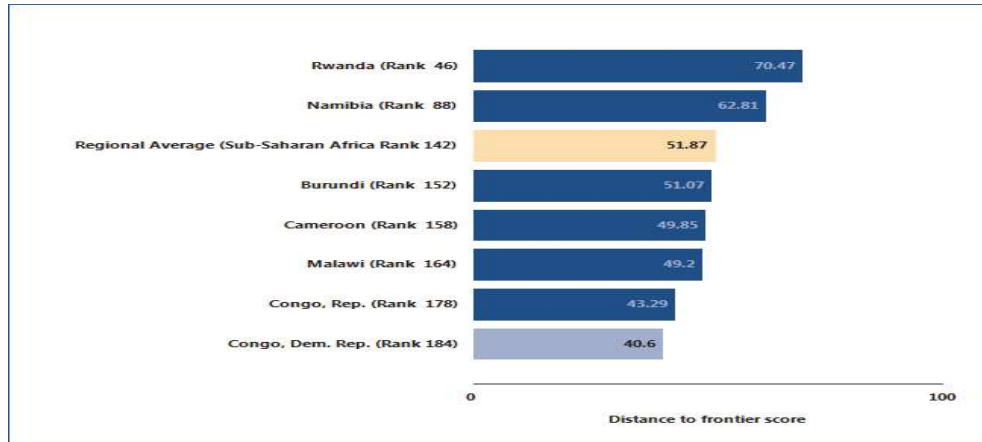


Studies by the African Development Bank noted:

- The DRC economy did fairly well overall in 2014, with sustained growth of 8.9%, controlled inflation (1.2%) and a virtually-stable exchange rate (slipping 0.1%).
- Growth should continue in the short and medium term, with favorable external conditions, steady reduction of the infrastructure deficit and expanding investment due to continuing government reforms.
- Despite these macroeconomic performances, the country still has very high poverty, large development disparities among provinces and weak spatial inclusion due to slow decentralization and delayed completion of infrastructure projects³ The DRC is perceived as one of the worst places on Earth to do business. Studies by the World Bank comparing business regulations among 189 countries ranked the DRC at the bottom of the assessment in

Africa against comparable economies when factors such as trading across borders, enforcing contracts and getting electricity are considered.⁴

FIGURE 3
HOW DRC AND COMPARABLE ECONOMIES RANK ON THE EASE OF DOING BUSINESS



Note: The rankings are benchmarked to June 2014 and based on the average of each economy's distance to frontier (DTF) scores for the 10 topics included in this year's aggregate ranking. The distance to frontier score benchmarks economies with respect to regulatory practice, showing the absolute distance to the best performance in each Doing Business indicator. An economy's distance to frontier score is indicated on a scale from 0 to 100, where 0 represents the worst performance and 100 the frontier. For the economies for which the data cover 2 cities, scores are a population-weighted average for the 2 cities.⁵

The Challenge

The challenge to be addressed in the developing nations of Sub-Saharan Africa is the need to create a capability on the part of the governments to develop, design, construct and operate necessary infrastructure components for the expansion of their economy. Historically, the nations have been unable to address their infrastructure needs due to paucity of funding and capacity. With the growing potential for funding from external sources, the countries must clearly define their needs, establish basic design requirements, apply appropriate levels of project management and oversee the development of the necessary transportation, energy and agricultural systems needed for growth.

Closing Africa's infrastructure financing gap will not only involve raising additional funds but also improving the efficiency with which existing resources are used. Lack of timely maintenance activities, inefficiency distribution networks, weak revenue collection performance, under-pricing of services, and low capital budget execution all lead to substantial wastage of resources currently available for infrastructure development. Thus, bridging Africa's infrastructure funding gap is as much about improving the performance of the relevant institutions as it is about raising additional finance.⁶

A key element to success of a Capacity Creation program in the developing nations will be forming a platform through which business can be accomplished under international standards for capital investment. The provision of the appropriate project management controls and governance of resources must be a primary focus of instruction in forming the capacity to function in the modern world.

The Capacity Creation Process

The creation of capacity should consider several global aspects to the process. The leaders of the nation that is being assisted must be made aware of what can be accomplished through the process. The process must empower all affected parties by including them in every aspect of the capacity creation process. The instructors must ensure that ownership of targeted projects is clearly held by the local

participants in order to sure that the local participants are fully integrated into the success of the project. In addition, the instructors must be sensitive to leading the involved parties, rather than merely focusing on the success of the task.⁷ The capacity creation process is an instruction process, more than a project implementation task

The process will work towards creation of capital investment plans, providing instruction on the skills needed to support sensible capital investment recommendations. The program will help develop a qualified cadre of individuals within government ministries who can perform capital investment planning by enhancing the technical instruction needed for the proper design and execution of major initiatives. In this manner, the government's technical capacity to develop necessary infrastructure for its needs will be expanded beyond current levels.

Creating a capital investment plan that will properly apply national wealth and meet economic development objectives involves closely aligning project development activities with national and provincial governments' strategic plans. For example, project proposals must demonstrate anticipated financial impacts, related revenue streams, economic impacts, and costs and benefits to citizens, businesses, and governments. Of course, the technical aspects of project design must be properly produced in accordance with standard engineering requirements and standards of performance. The Capacity Creation Team (CCT) will assist in identifying and analyzing these issues and demonstrating the rationale for pursuing particular projects.

Creating necessary levels of internal capacity across all aspects of project development – from concept and design through completion – require full attention in a Capacity Creation initiative. Providing assistance to the capacity formation effort should address such actions at two levels: the functional level of providing guidance to the ministries and agencies tasked with infrastructure development and the academic level of providing guidance and support to the various DRC universities that train future engineers, business people and officials in the necessary skills needed to perform infrastructure development.

The assistance would be provided in the form of “Learning By Doing” and “Training the Trainer” – including DRC ministry personnel, faculty and students, as well as local contractors and business people in the actual performance of tasks associated with each instruction effort. Through the “Learning by Doing” approach, actual tasks can be accomplished by the instruction staff, with strong assistance from local talent, while discrete questions and complications are directly addressed by instructors. The entire program of Capacity Creation should employ the 3 T's “Train The Trainer” as a key element of program delivery – thereby providing a platform to ensure continuous training following the Capacity Creation program.

The employment of local expertise in the formation of development capacity can ensure the local conditions are carefully incorporated into the development, design, construction, operation and oversight of projects achieved through the Capacity Creation process. The shared experience serves as the most effective means of transferring knowledge about technical features of all associated tasks.

Capital Project Development is a multi-step approach:

- Capital Planning
- Project Financing
- Project Selection
- Project Design
- Project Implementation / Construction
- Project Operations
- Project Maintenance

The Capacity Creation process must address each aspect of the Capital Project Development process through thorough instruction of all involved parties in each component of the Development Process.

The participants in the Creating Capacity process will include universities, vocational technical institutes, government ministries and agencies as well as private sector organizations involved with the

development of capital assets. Each of these parties should receive instruction and experience in their respective roles.

Government officials should be provided guidance on methods needed to form Capital Strategic Plans, methods to properly select projects and how to describe the selected projects through Project Business cases and Feasibility Studies. The ministry and agency personnel must become acclimated to the process for performing financial assessments of proposed projects, as well as the means to evaluate the relative benefit of all proposed endeavors to allow proper selection.

Ultimately, the government personnel must become familiar with the steps required to actually develop and implement a project, from design review through project management tasks.

**TABLE 1
PROJECT DEVELOPMENT PROCESS**

PROCESS TASK	EXECUTION FUNCTION
Capital Planning	Strategic Plan Mission statement Vision statement SWOT Assessment Project Selection
Project Financing	Feasibility Analysis Business Cases Define Sources
Project Implementation	Procurement Construction Project Management Project Performance Reporting
Project Operations + Maintenance	Hiring Customer Relations Performance Reporting Financial Management

The Universities should be positioned to ensure that students are properly trained in the production of engineering studies for various types of projects – highway, rail, transit, energy, agriculture. The business schools should be able to instruct persons in the production of financial studies for various types of projects as well. Vo-Tech institutes should be properly positioned to offer instruction in the crafts and middle skills needed to perform tasks in support of engineering / financial studies, such as surveying and CAD Design, as well as the crafts needed to perform project construction.

Questions to be addressed in the initial phase of Capacity Creation instruction would include issues such as:

- Define what infrastructure is needed
- Determine the timing of available resources to invest in infrastructure
- Prioritize and rank the projects needs through assessment of each project’s contribution towards pre-defined metrics
- Evaluate the specific expected deliverables from each proposed project in the context of the available resource scheduling
- Determine ability to link diverse projects into a singular implementation schedule and program of activities
- Define the specific projects to be scheduled with full consideration to the ability to link project actions.
- Apply available funding to projects
- Commence project implementation

The prime advantages of the Creating Capacity approach are that it is consistent with the most effective techniques for adult learning – producing immediate results through completion of project conclusion. Use of “Train the Trainer” protocols will create a core community of practice that can continue to grow and expand across the continent.

Private sector participants should be included in each of these areas of project development. All participants also need to become fully vetted with information about proper project definition, and management task to allow full evaluation of all project activity at every step in the development process by all affected persons.

Creating Capacity Timeline

The prospective timeline for providing capacity development can be applied consistently in any environment, since the same tasks are required.

The initial phase of any capacity development effort will require defining the Scopes of Service with the specific government body. There is a strong need to clearly define the roles, responsibilities and respective budgets for each participating agency and University – from foreign lands or in-country. In addition, the level of participation from private sector parties is also an essential piece of information for the formation of the program. All funding of the program for all parties should be defined early in the program, as well.

Following definition of budgets and schedule requirements with all participants, formal contracts should be finalized among the parties to ensure continued involvement and minimal distraction from the rather heavy burdens to be shared. Inter-University dialogue should commence immediately to begin the formation of instructional materials, equipment and protocols to be used by all parties as well as data requirements for the various tasks.

Evaluation of the specific IT resources to be available to all parties should occur in order to allow programs to be developed with sensitivity to the realistic capabilities to employ remote learning tools. Among key tasks to be addressed through the Capacity Creation process would be the development and implementation of appropriate information and communications (ICT) infrastructure to support the project’s learning and practice objectives. Using local IT professionals to employ technology provided by CCT personnel, the resulting IT infrastructure and resulting levels of local competence could provide a prototype for a nationally integrated capital project development system.

Data Collection will be first major task to begin the program. Defining the information needed to begin assessment of potential projects as well as general economic impacts of such ventures is necessary to allow for an effective analysis to be performed. Construction of feasibility studies and business cases for each project will commence as will preliminary engineering studies, as appropriate. Such early work will allow the preparation of financial studies that will be needed for the Project Financing tasks.

Overall project development instruction will begin. As financial plans, business cases and feasibility studies are created, the project selection process can begin.

Project selection results in financial planning and ultimately assignment of resources to discrete project activities. The implementation of projects can begin upon selection of a particular endeavor. Preparation for actual project execution would include activities related to Project Planning and Management – defining and specific project budgeting, scheduling and scope, Project Budgeting and Financing, Project Internal & External Communications, Procurement, Project Performance Monitoring & Evaluation, and Personnel Management. These activities will result in the final approval of specific projects, with actual final design and construction beginning shortly after approval.

Each of these tasks will be performed by local participants, with guidance and review by the instruction teams. University involvement by faculty and students will ensure that the activities are integrated into the curriculum and study program developed by faculty for future courses.

Throughout the project implementation phase, the instructors will continue to provide guidance and support, offering recommendations on specific questions that may arise on review of local activities.

Capital Planning

A major task to be accomplished through a capital planning initiative is the formulation of an effective Strategic Plan. A Strategic Plan determines where an organization is going over the next year or more and how it's going to get there. The Plan should address what overall accomplishments the organization should achieve and the overall methods (or strategies) to achieve the accomplishments.

The Strategic Plan must include a Mission statement, Vision statement and a statement of the guiding principles of the organization. The SWOT Assessment component of Strategic Planning – a statement of strengths, weaknesses, opportunities, and threats must drive the overall planning initiative. The organization's competitive advantages must be published along with a clear definition of the Long-term strategic objectives over a three-year (or more) time horizon. The specific Strategies to be pursued are the general, umbrella methods to achieving Short-term goals/priorities/initiatives - specific performance targets within the one- to two-year time horizon. The Action items/plans – stating how a goal will be accomplished – executed within one to two years, should be accompanied by Scorecards - key performance indicators (KPIs) and financial assessments of the impacts of the desired strategies.

The Capacity Creation program will instruct government, university and private sector participants on methods to be used to Formulate Strategic Plans for their respective groups, along with the methods to establish attractive project feasibility studies and business cases to justify the projects to potential investors and funding bodies. The program must also define methods to select projects for funding and implementation with the maximum impact on achieving the defined strategic goals of the entity.

Capital Plans must be developed. Effective capital plans will be based on the clearly established goals of the strategic plan. IT must define the goals of each investment and define the aspirations for all project deliverables. The Plan must focus on the properly described feasibility studies and business plans for each project and must also rely on complete project development schemes.

The Capital Plan must employ sensible, equitable approaches for selecting discrete projects for funding within the overall plan. The Plan must also require effective project management and performance reporting of all aspects of the plan.

The Capacity Creation program must train all parties in the formulation of Capital Plans that meet international standards through specific training in Strategic Planning, Business Case Development, Feasibility studies, Project Management + Project Reporting, as well as some attention to new opportunities available through Private-Public Partnerships.

Feasibility studies should drive project selection decisions, addressing issues such as who will use/ benefit from project and the Social, Economic and Environmental Impacts of project. Technical/ Engineering reports on project development and results are also an important factor to be considered.

Project Financing

The project financing process would be an early phase of capacity building, coincident with the formation of the Capital Plans. Before efforts are expended in development of projects, it is essential that all parties fully appreciate the financing limitations of the ultimate funding body. Assessing the capability of the sponsoring body to finance discrete projects will enable project selection to be controlled by associated limitations.

To address the needs and interests of international investors, capital project descriptions must identify prospective financial results such as return on investment, internal rate of return, and payback periods.

The project finance training task must build technical capacities to deliver the following:

- Training in Strategic Planning
- Training in Business Case Development
- Training in Feasibility Study Formation
- Training in Project Management + Project Reporting
- Training in Private-Public Partnerships

The financing needs of Sub-Saharan infrastructure are significant. A developing nation's ability to service debt directly is minimal. For decades, the most basic infrastructure needs of these nations have

been partially addressed by various development bank organizations. However, particularly since the end of the colonial period in 1960, enormous needs have been unmet, resulting in the current state of affairs. In more recent years, some new investment in infrastructure has been implemented, often with links to the nations' enormous mineral resources. However, the nations' capacity to participate in financial markets has grown through a strengthening of financial capabilities in economic governance.⁸

A campaign for capacity creation should focus on the need for proper governance of financial resources. Part of such a campaign should ensure that appropriate budgetary structures are defined to establish methods to control flow of funds and application of such monies to desired projects. Through such an effort, internal budgeting of resources to selected initiatives can be produced and employed in managing available funds in a systemic fashion. Provision of a comprehensive financial management program of instruction, comprised of basic instruction in accounting, finance, economics, marketing and management skills, provided by business school participants should be included in any Capacity Creation campaign.

The ability to attract private funding of infrastructure programs will be significantly enhanced with the ability to present sensible, transparent reporting of financial activities across the board. Such reporting can then be applied to discrete project activity in concert with the needs of the funding bodies, as well as relevant development bank involvement.

Capabilities to clearly define project cost requirements is another task to be achieved in the capacity creation process. Evaluation of historic project cost experience in the specific nation, with consideration to methods for redoing such costs through adjustments in project implementation practices and through application of value engineering analyses is a key factor to be addressed. The use of novel solutions to the financial needs of the nation's infrastructure can enhance the breadth and scope of such programs. Increased reliance on Public-Private Partnership (P3) transactions can involve private sector investors into addressing the needs of the nation. Other forms of innovative financing can also contribute to the cause.

Capacity Creation efforts can help to develop increased linkages between new infrastructure projects and ongoing economic engines. Financial platforms such as mining interests can contribute, through provision of shares in mining activity to investors in other infrastructure initiatives, thereby allowing refunding of investment through methods aside from the specific assets constructed through the investment program.

Providing assistance in forming a close allocation of project risk among all involved parties is another manner in which financing tools can be developed through the capital creation process.

Through instruction in financial management, the local interests should gain improved ability to define the available funding for infrastructure project activity, methods to access the intended forms of financing, approaches to consider in defining collateral for debt financing. The newly created experts in infrastructure management should be able to clearly estimate expected revenue streams from proposed activities and produce bona fide cost / benefit analyses, Return on Investment analyses for prospective investors.

The planners must also include a complete assessment of risk that reviews the propriety of proposed project scope, budget, and schedule, as well as the risks associated with obtaining forecasted revenue levels using the underlying project assets through the impact of expected usage projections and the projected cash flow streams from the project. Risks associated with the proposed scope, budget, and schedule must also be considered the impact as well on existing conditions such as environment, existing infrastructure, the local economy, and climatic conditions and properly and completely assess all project risks, include the risks to revenue streams.

Project Selection

When the financial capabilities of the complex have been ascertained through study of financial conditions, an effective project selection process can commence.

One task to address early in the process of creating an infrastructure development plan is defining the parties responsible for making the decisions on major questions such as the selection of discrete projects

to be pursued, parties to be responsible for the projects and the planned entities that will be ultimately responsible for the operation and maintenance of the assets when placed into service.

Following these decisions, the assigned decision makers must apply resources to define potential projects to be considered, with efforts expended in stating data to be obtained for each prospective effort. Data pertaining to estimated costs to produce and operate each effort, the resulting benefits from each effort – financial, environmental and other must be established.

Risks associated with each project must be clearly defined and evaluated for the purpose of ranking protocols. Risk should consider the exposure to the nation, region or entity of not performing the project, risk associated with performance of the project and risks associated with the implementation of the project.

The project selection process must be initiated through definition of specific metrics against which all project must be weighed for eventual ranking. Metrics to be considered would include issues, such as:

- Expected Return on Investment
- Impact on local economy
- Impact on regional economy
- Impact on national economy
- Impact on safety – users, neighbors, employees
- Impact on Strategic plan execution
- Impact on export / import traffic
- Volume of people affected – moved, hired, serviced
- Relative risk of not performing the project on economic, safety and life styles.
- Risk assignability

The ultimate ranking can be based on:

- Attractiveness of Business Case
- Delivery of Strategic Plan Needs
- Risk of project delivery
- Impact on performance of existing / needed infrastructure
- Financial Impact of project

Selection Ranking should be based on

- Anticipated Financial Impact
- Revenue Streams
- Economic Impact on Region
- Benefits to Citizens
- Impact on National / Provincial Businesses
- Financial Results – ROI, IRR, Payback Periods
- Assessment of Risks
- Validity of Proposed Scope, Budget, Schedule
- Revenue Risks related to ultimate Usage of asset
- Impact on existing infrastructure

Other metrics would be defined by the specific strategic goals of the region under development. Each project must be scored against each metric on a scale, such as 1 to 10. The scoring panel should be comprised of individuals involved with the formation of the program of projects, specialists in the respective fields of endeavor, leaders of the respective areas to be affected and project management personnel. Experts in the particular fields of interest could also be included among the project evaluation team. For the purposes of the capacity creation process, scorers should be comprised of the instructor team, joined by the senior members of the faculty and ministry staffs involved with the program, to “Learn by Doing” project selection.

As the scores are produced, the ranking of the projects can be achieved. Ranking will be the ultimate determinant of a project’s further movement in eh process. The ranking of projects based on their

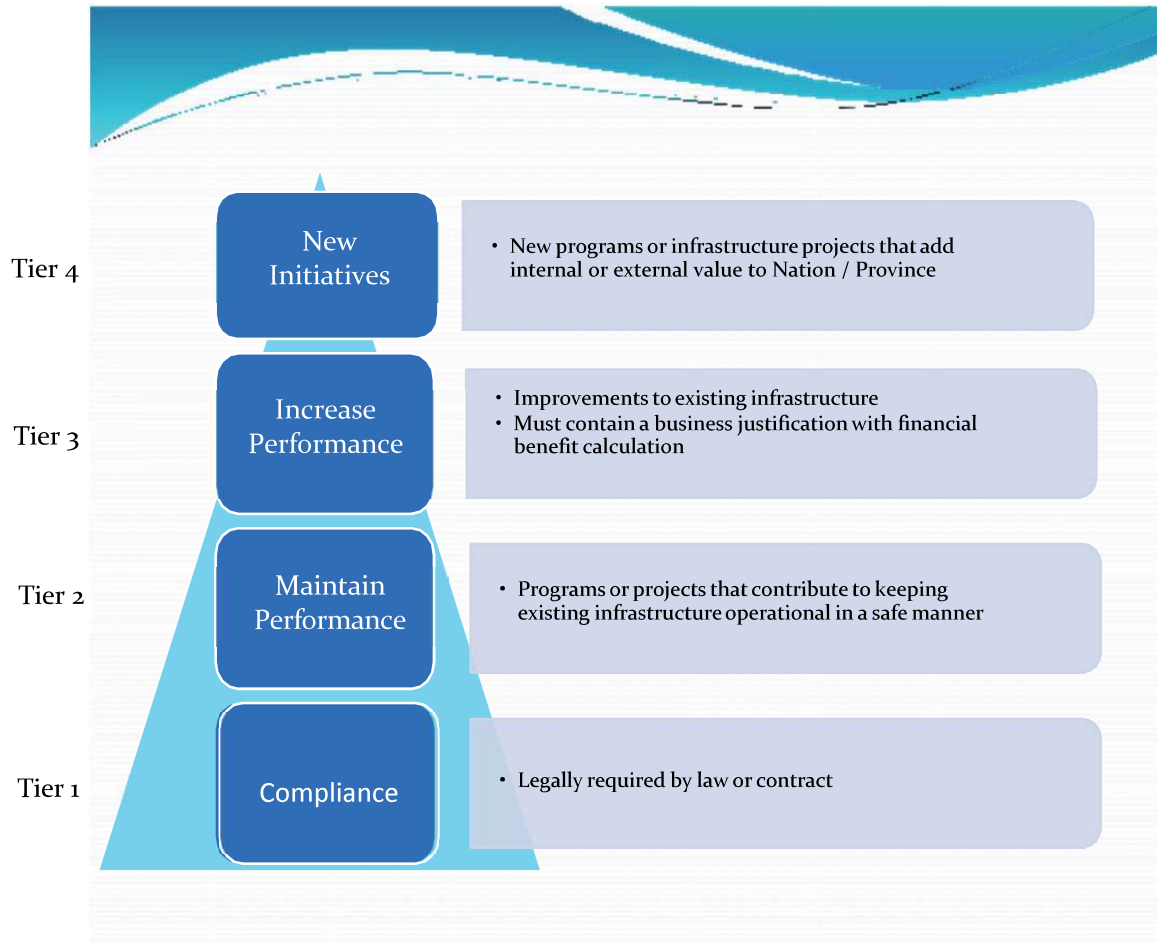
respective ability to meet the strategic goals of the region ensures that resources will be applied to the efforts with the most immediate positive impacts. Risks must be a major factor in establishing a project's ranking, as well.

When the projects to be undertaken are defined, the parties that have been assigned responsibility for each task must commence efforts for final project planning. Planning must include participants from government, industry, project teams and the local economy. For the Capacity Creation effort, planning teams should be led by the instructors and include ministry, faculty and student representative for the purpose of learning by doing.

Spending priorities should be linked to strategy. Projects that are required for legal or safety purposes would normally be placed higher in the priority list. Strategies related to maintenance requirements for assurance of reliable output from the asset, compared with the need for completely new infrastructure would be a part of the weighting process, and with scoring of individual projects associated with the preferred strategy.

The overall categories of spending prioritization need to be used in the ranking process to ensure the priorities of the national, regional or entity strategy are fully considered in ranking projects. In the sample presented, the entity had given priority to projects required by law or safety – “Compliance Projects.” Such efforts are exempt from many other levels of analysis and are given significant prioritization on allocation of resources. The next level of project preference was applied to tasks related to “Maintaining Performance” of existing assets through repair and replacement projects. “Increase Performance” was the next level of preference, allowing projects that would improve or expand deliver of products and services to receive more credit than “New Initiatives,” which would be projects creating wholly new programs of activity or service.

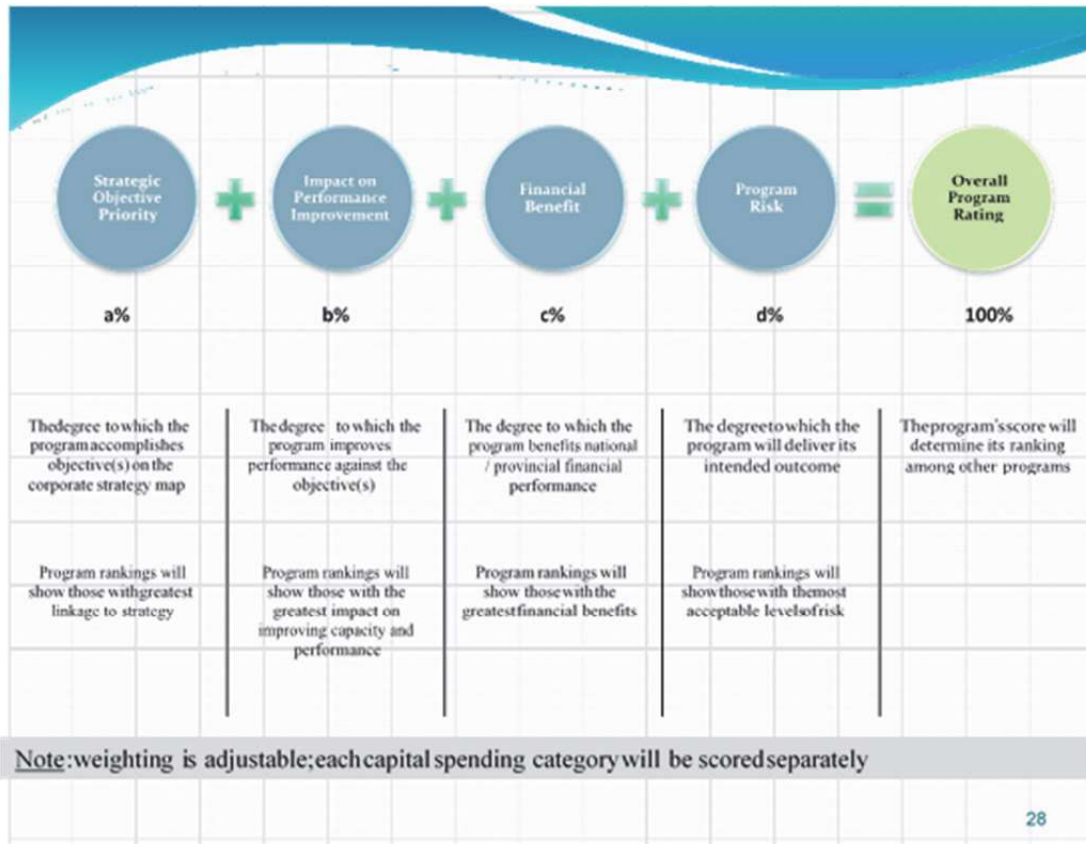
TABLE 2
CAPITAL SPENDING CATEGORIES



In the case of developing countries, the “Maintain Performance” and Increase Performance” categories are most likely not very pertinent, nor would they necessarily receive higher priority over the creation of “new Initiatives” that would produce wholly new services for the nation. Such prioritization would be a clear focus of conversation among the rating bodies.

When priorities are defined, scoring can begin. In this example, only four major ranking tools were employed – conformance to strategic objectives, impact on performance, financial measures and program risk. The importance of each ranking tools was applied to the score and the results tabulated.

**FIGURE 4
PROJECT SCORING CRITERIA**



Project Design

When a project is selected for implementation, the implementation phase of the project commences. The initial phase of implementation is the design phase, during which the technical, financial and operational needs of the ultimate asset are defined, designed and evaluated.

Following the project selection process, the instruction would proceed to address the needs for engineering and design activities associated with project design.

Questions on the design must be addressed such as who will produce the technical design, what assistance can be obtained for the technical design, the development of financial structures, as well as who will craft the operational issues to be addressed in the design. In addition, thorough analysis about the actual operational aspects of the asset must begin with the design, to ensure that the technology to be installed conforms to the desired produced results.

With the developing country, the CCT will assess the capabilities of local talent to produce the requisite technical designs and operational framework of the project. Establishing project management capabilities and design review protocols will also be needed. The use of properly trained engineers for the technical tasks is essential, as well as provision of the necessary engineering technology to produce drawings, design documents and necessary component and labor requirements for pricing and project budgeting and scheduling.

Depending on the type of project to be developed, the appropriate engineering skills would be established through interaction with the local polytechnic colleges. Civil, Mechanical, Electrical and Architectural Engineering programs would be presented for review and discussion with the CCTs in order to assess curricula, texts, faculty resources and laboratory spaces available for proper instruction of 21st century engineering practices. Highway, rail, mass transit and energy projects have varying types of

engineering functions to apply, however, civil engineering would be the primary skill-set required for most tasks. Accordingly, the poly-technic engineering faculty and students would be coordinated with their peers from the instructing body for preliminary sessions on logistics required for the design function. In developing the engineering instruction, consideration should be given to recent developments in engineering programs that use systems engineering approaches to integrate engineering, policy, and social science instruction and analyses.

The poly-technical engineering programs should be assessed by CCT members along with the senior faculty of the local campuses to assess procedures used for recruiting and selecting students, pre-educational review of student readiness for university-level training. The classroom and laboratory spaces used for teaching, availability and condition of laboratory equipment, including information technology equipment should also be assessed. In addition, the frequency of class offerings of courses listed in the current curriculum, size of classes, techniques used for gauging student competency should be reviewed. The production of the institution should be also examined, reviewing the numbers of students graduated/graduation rate, methods used to prepare for professional certification, and the administrative oversight of all of these elements.

The review team should prepare reports summarizing the status of all of these elements. For use in developing an overall plan for refining the quality of university-based education in the knowledge and skills needed to produce infrastructure programs.

As part of the capacity building process, the technologies necessary for project design of the specific task would be defined. Methods of obtaining such resources as CAD technologies and providing necessary instruction in their use would be a key feature of initial demonstration. The transfer of skills related to the vocational technical tasks associated with design work will be an important feature of the Creating Capacity programs. Skills required to operate CAD systems, civil engineering technologies, building construction technologies, surveying and certain activities associated with architectural technology will require the involvement of vo-tech schools that provide such instruction. Analysis of methods used by local Institutes in the instruction of vo-tech skills will provide the means to enhance such programs through use of the “Learn by Doing” approach – using the faculty and students of Institutes to support the design activities on the projects.

Extensive discussions will be needed to address the differences between Western design protocols and those employed in sub-Saharan Africa. Such standards will be impacted by the local environment, with heat and moisture issues impacting the specific levels of products needed to ensure long-term performance of the asset. As an example, the average temperature in Kinshasa, DRC is 25.5 °C (77.9° F) while the annual the average rainfall is 1368 mm (53.8”).

By comparison, the average temperature in Philadelphia Pennsylvania is 12.5 °C. (54.5° F) while the average annual rainfall is 1113 mm (43.1”).⁹ Such differences impact the level of asphalt required for road construction, as well as asphalt longevity. Other factors of project design impacted by climatic conditions would include:

Project Construction / Implementation

The construction phase of any project must take into account the need for appropriate project management functions. Who will be responsible for managing the project – what organization, person or team – will be held responsible for project performance, maintenance of quality control functions and assuring that the project meets the required budgetary and scheduling factors?

Another key question of similar nature is who will actually operate the asset resulting from the project. To accomplish the planned allocation of responsibilities, what changes will be needed to underlying governmental control or existing management structures to assign the tasks properly and effectively. If new persons must be retained to perform the required project management and asset operation functions, these issues should be addressed at the initial phases of the project implementation process. A key aspect of any capacity creation efforts must include demonstration and formation of essential project management skill sets for the oversight and implementation of major infrastructure undertakings!

The capacity creation needs of project construction and implementation would include attention to topics such as project component scheduling, equipment and human factors, project management functions and assurance of quality control throughout the implementation phase.

FIGURE 5
PROJECT MANAGEMENT KNOWLEDGE AREAS



¹⁰Working with the tools available through the Project Management Institute and the University’s resources, the CCT can provide guidance on the instruction and implementation of key project management tasks related to the oversight of budget, scope, schedule issues, as well as important decisions related to Risk Management, Quality control, Procurement, Human Resources and Communications functions associated with major projects.

Working with government ministries, the instruction team will establish required teams of project managers for each function. The teams will be established for the specific projects to be undertaken and work will be performed by the instructor / employee teams in concert with each other. Simultaneously, faculty of the polytechnic schools will be incorporated into the project management teams, to observe the processes employed in the various tasks. To the extent possible, students at the graduate and undergraduate levels could be included in the performance of the functions

Through the actual performance of project management functions, the employees and university personnel will become familiar with the concepts presented. Through courses assorted with the Project Management Institute’s Project Management Professional programs, the participants can become certified in the skill set that will be essential for future development programs. Students should become very familiar with the tenants of ISO Standard 21500 – the guide for project managers published by the International Organization for Standards, (ISO).

“This International Standard provides guidance for project management and can be used by any type of organization, including public, private or community organizations, and for any type of project, irrespective of complexity, size or duration. This International Standard provides high-level description of concepts and processes that are considered to form good practice in project management. Projects are placed in the context of programs and project portfolios; however, this International Standard does not provide detailed guidance on the management of programs and project portfolios. Topics pertaining to general management are addressed only within the context of project management.”¹¹

Another key resource to be employed in the instruction on Project Management would be the Project Management Book of Knowledge (PMBOK), published by the Project Management Institute. “The PMBOK® Guide is the preeminent global standard for project management. It provides project managers

with the fundamental practices needed to achieve organizational results and excellence in the practice of project management.”¹²

The actual implementation of the related construction phases of the projects will require the involvement of local contractors and staffing. The process of converting design drawings to reality will necessitate direct involvements of the architects and engineers with the contracting community. Furthermore, the need to apply the crafts and middle skills to the construction process must be addressed. Practice and instruction in building construction technology, electrical and plumbing functions, heating, venting and air conditioning (HVAC) skills must be transferred through connections between vo-tech schools and local Institutes.

Project Operations / Maintenance

The operating and maintenance needs of each type of infrastructure asset varies. The basic requirements require that attention be applied to ensuring constant attention to preventive and rehabilitation maintenance throughout the useful life of the asset. Sensitivity to establishing the long-term maintenance needs, along with appropriate budgets for Repair and Replacement (R+R funding) as well as scheduling of ongoing running maintenance requirements should be addressed as the asset is under construction. Operating needs for each asset also require appropriate training programs to ensure proper, efficient operations of the assets.

CONCLUSION

Internationalization is a strategic response to globalization. It is a learning process that can be used both at home by learning from best practices around the world to create capacity for infrastructure and abroad to expand globally. Our case study in the DRC demonstrates that this learning process can take place in one of the most challenging business environments on Earth. While our study cannot be generalized, we believe that it contributes to the internationalization and economic development streams of research and that it is applicable to other business environments that the DRC in Africa.

ENDNOTES

1. World Bank - <http://data.worldbank.org/region/sub-saharan-africa>
2. The World Factbook <https://www.cia.gov/library/publications/the-world-factbook/geos/cg.html>
3. African Development Bank Democratic Republic of Congo Economic Outlook 12/22/15)
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5. Doing Business 2015 Congo, Dem. Rep. Doing Business ob. cit.
6. Fact Sheet: Infrastructure in Sub-Saharan Africa 2013; World Bank, 2013; <http://go.worldbank.org/SWDECPM5S0>
7. 4 Ways Leaders Create Capacity in the Organization Ron Edmondson, <http://www.ronedmondson.com/2015/08/4-ways-leaders-create-capacity.html>
8. World Bank DRC Overview <http://www.worldbank.org/en/country/drc/overview> 11/19/2015
9. Climate Data.org <http://en.climate-data.org/>
10. Project Management Institute, Palm Island Jumeirah <http://rajviraujlapmp.weebly.com/knowledge-areas.html>
11. International Organization for Standardization ISO 21500-2012 <https://www.iso.org/obp/ui/#iso:std:iso:21500:ed-1:v1:en>
12. Project Management Institute <http://www.pmi.org/PMBOK-Guide-and-Standards/pmbok-guide.aspx>

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