



# **INFRASTRUCTURE NEEDS IN SUB SAHARAN AFRICA WITH PARTICULAR REFERENCE TO SOUTH SUDAN**

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This paper focuses on South Sudan's infrastructure delivery in an efficient and effective way. South Sudan, though endowed with considerable natural resources, still lacks the necessary infrastructure for improvement in the standard of living for the population. This paper presents aspects of qualitative and quantitative data obtained using questionnaires and interviews. It was found that most of the population had access to health facilities within a 10 km radius and 65% of the respondents stated that they are able to walk such distances. Regional connectivity infrastructure was rated very highly by the respondents. As far as soft infrastructure needed for education, there is a crucial need to invest in adult literacy especially in the field of science and engineering to ensure appropriate participation of the citizens in the developmental agenda for South Sudan. Developing the human capital is crucial in attracting local and foreign investors in infrastructure projects. Tertiary institutions of learning in South Sudan will need to focus on education and training to ensure that the country will have locally qualified people to design, construct and manage the necessary soft and hard infrastructure. The findings can be relevant to Asian countries of similar needs in developing their infrastructures.

*Keywords:* International Development, Health, Education, Transportation.

## **1 INTRODUCTION**

The paper reports some aspects of a wider project focusing on the provision and maintenance of public infrastructure in South Sudan. The investigation included transportation, water and sanitation facilities, irrigation systems, power supply and communication systems. Skills availability pertaining to engineering and science were also investigated.

After almost five decades of civil war, in July 2011 the people of South Sudan completed the process of independence from Sudan. South Sudan then became the United Nations' 193<sup>rd</sup> member and the 55<sup>th</sup> African nation (Salman 2011). Although there is limited data about South Sudan, the United Nations Development Program (UNDP) has ranked Sudan as 171 out of 186 on the Human Development Index (HDI) 2012 ranking. South Sudan has rich soils and good rainfall patterns which should provide a basis for a thriving economy but the area is chronically underdeveloped due to its' historical marginalization from the north (Jooma 2011). Poverty in the south is estimated at 90% (Jooma 2011). This was not helped by South Sudan's most recent history of conflict which broke out in Juba, December 2013 and lasted for nearly 2 years. The

financial impact of the conflict in the capital Juba in 2013-15 led to the decline in gross oil revenue from \$29.35 million in December 2013, falling to 10.8 million in January 2016 (The World Bank 2016). The Government of South Sudan (GoSS), with the support of donor countries, UN and Non-Governmental Organizations (NGOs) have worked diligently to ensure that security, roads, health, education and agriculture are prioritized (Government of South Sudan 2013).

The neighbors of South Sudan, shown in Figure 1, have varying degrees of interest in the political developments in their neighborhood. Ethiopia, Kenya and Uganda have been developing ties with Juba. They welcome the presence of a state with an African identity as opposed to Arab identity (Belloni 2011). Juba, the capital, offers a strategic location serving the local and foreign investors in the region. Juba is reported to be rapidly expanding with the fastest rate of urbanization in history (Grant and Thompson 2013).



Figure 1. Map of South Sudan.

The strategic development plan of the GoSS until 2040 includes very ambitious social and economic aspirations (Government of South Sudan 2013). The GoSS has identified infrastructure as one of the pillars for its' economic development. South Sudan is one of the least-developed and the most oil-dependent countries of the world with oil accounting for over 95% of its' national budget.

The Gross Domestic Product (GDP) per capita in SS in 2010 was \$1546 (Salman 2011). This was much higher compared to Kenya, Rwanda, Tanzania, Uganda and Ethiopia which had GDP per capita of \$769, 548, 527, 503 and 350 respectively. This was attributed to the higher revenue from the oil in SS which was used to support the war efforts while the basic services were still not sufficiently available. With the oil infrastructure of the pipeline, the refineries, the export facilities, as well as the ports themselves all situated in northern Sudan, the two countries are poised for intricate and difficult negotiations on this matter. South Sudan is forming strategic cooperative agreements with Kenya and Ethiopia to gain access to skills and capability in exchange for natural resources (Thompson and Strickland 2004).

## 2 RESEARCH PROGRAM

During this research, questions related to mode of transportation infrastructure in particular relief logistics to provide humanitarian relief supplies as well as issues related to water supply, sanitation and public health, food security, and energy resources were explored. Qualitative and Quantitative methods were used for triangulation (Fellows and Liu 2009). The triangulation was

achieved by combining the answers from respondents who agreed with suggestions made by the author and open ended questions which gave an insight to the author in certain aspects. A literature review of the data collected by aid organizations, the World Bank, the UN and the South Sudan infrastructure reports was carried out to identify knowledge gaps.

Primary data were collected through questionnaires from contacts in South Sudan. Raw data were also collected from the residents of South Sudan in the form of an open ended questionnaire (qualitative data) and interviews in order to gather their perceptions about infrastructure issues that impact on their lives. The questionnaires also asked the type of work they did so as to assess the respondents' bias. Through the questionnaire, the respondents were also asked to help in ranking or prioritizing infrastructure that is of importance to them as opposed to imposing what the researchers think is best. Secondary data were mainly collected from the GoSS development plan and case studies such as reported by Buys *et al.* (2010) and Yoshino *et al.* (2011). The importance of an integrated road network to stimulate the economy was highlighted.

### 3 FINDINGS

Figure 2-A shows that about 58% of the respondents walked if the distance was less than 10km. When the distance is greater than 10km, 67% travelled by private care while approximately 33% travelled by bus for longer distances. It seems that the river Nile was not exploited for transportation purposes. Use of public transportation is very limited due partially to security issues.

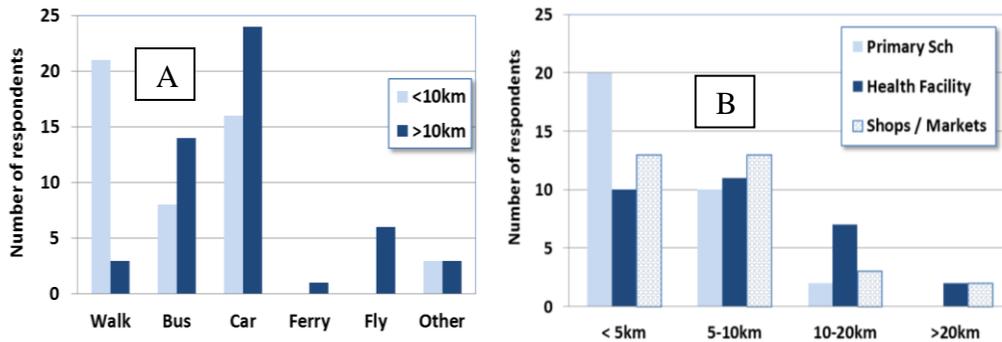


Figure 2. Transportation issues: A) Mode of travel and B) Distance to amenities.

Responding to the question related to the distance to the nearest primary school, 63% said they were within a 5km distance which is generally considered as walking distance for primary school children while 31% said the primary school was more than 5km but less than 10km away as shown in Figure 2-B. In terms of the proximity to a health facility, 33% responded that they were within 5km while 37% said the nearest health facility was more than 5km but less than 10km away. It is noteworthy that 7% said the nearest health facility was more than 20km away. Regarding distances to nearest shops and markets, 40% responded that they lived within 5km of the shops, for 43% of them the shops were 5 to 10km away. Over 16% said the amenities were over 10km away.

Regarding fresh water and sanitation issues, Figure 3-A shows that about 50% said they obtained their water from a well or borehole within their village and 31% said their fresh water supply was from a river. Regarding sanitation, 72% said they used pit latrines while only 22% said they had toilets with a flushing system. Interviews highlighted obvious absence of flush toilets throughout the country. Regarding sources of energy and fuel for domestic use, 75% used

firewood and 44% used electricity while at least 28% used petroleum or paraffin while 13% used gas as shown in Figure 4-A.

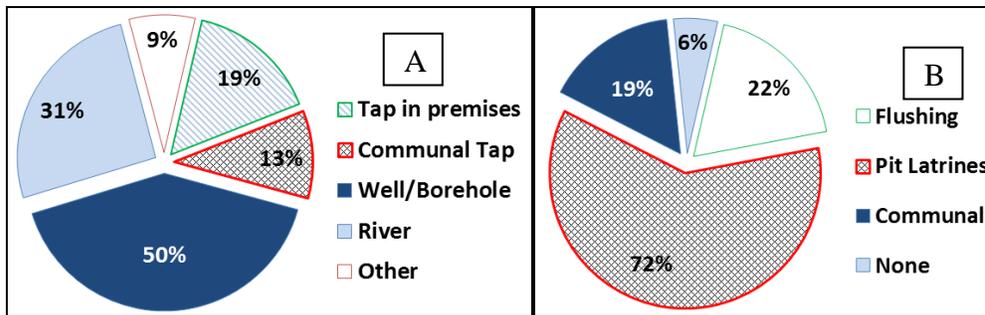


Figure 3. Water and sanitation issues: A) Sources of water and B) Types of toilets.

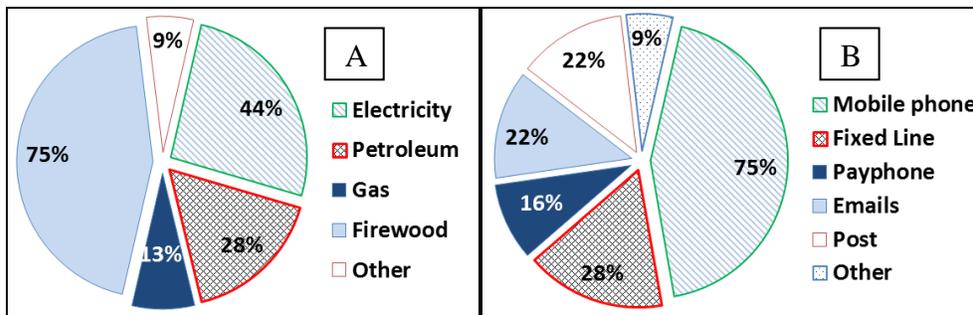


Figure 4. Energy and communications issues: A) Energy and B) Communication.

For communication, 75% of the respondents had access to mobile phones. 28% responded they had access to a fixed line phone and 22% responded they had access to emails and letters through the post. 16% responded they had access to payphones. Some responded that they relied on word of mouth, messengers from village to village, VHF radios and satellite phones while in very remote locations. Questions related to building the human capital and the skills capacity for South Africa will be the subject of further publication. During the initial study, 69% of the respondents agreed or strongly agreed that the focus should be placed on science and engineering. However, the interviews highlighted that there is a desire for a holistic agenda for education focusing on sustainable development. When asked if they thought the government should allocate more resources to promote infrastructure delivery, 90% of respondents agreed. Interviews revealed that the government needs to do more in promoting the country's image as a safe infrastructure investment area and to fight corruption.

The respondents were asked to rank twelve categories of public infrastructure services in what they considered to be of the most importance. Figure 5 shows that health facilities were ranked to be of highest importance by 72% of the respondents, followed by water and sanitation with almost 63% ranking it as most important while the regional road network was third with 58%. Education facilities were fourth with almost 55% of the respondents ranking it as most important and local roads and bridges were fifth 47% ranking them as most important.

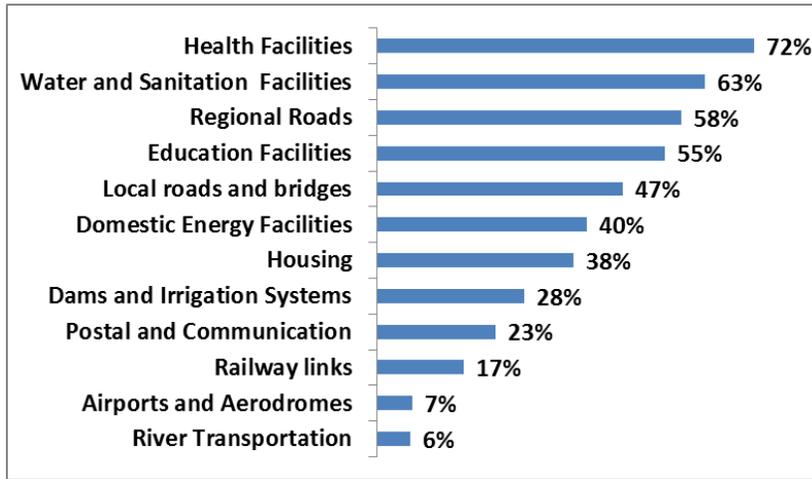


Figure 5. Infrastructure needs priorities.

#### 4 CONCLUSIONS

The research has revealed that although South Sudan is a relatively new country, its strength lies in its resources (including water, agriculture, and young people) which are underutilized but with good management and strong leadership these can be further exploited for long term sustainability and growth. It is anticipated that opportunities for development and wealth creation will come through development projects from overseas investors, sponsorships, NGOs and neighboring sub Saharan nations, to work in partnership with the South Sudanese government in creating jobs, skills transfer, training and development opportunities for improved employability for a largely unskilled workforce.

A major weakness for South Sudan is its educational system. The government has started to address this with a planned educational reform program to public education starting from primary level through to adult education programs. This has its challenges including long-term affordability, maintaining and distributing the fiscal budget fairly on public education during periods of uncertainty.

The research shows that whilst ‘hard’ infrastructure is necessary for development, there is also a need for the government to prioritize over ‘soft’ infrastructural needs. It was originally hypothesized that hard infrastructure would be the priority for economic growth and success. However Figure 5 demonstrates that there is still a long way to go before this can be realized. The South Sudanese people will need to have their basic needs satisfied and quality of life before they can develop further trust and confidence in the government programs and initiatives.

It is therefore recommended that the government focuses its attention in the short term, to concentrate on improving basic skills and literacy which can also be blended with adult learning programs and on the job training (e.g., apprenticeships) to help up-skill the workforce. However, more long term educational reforms combined with entrepreneurial initiatives will go a long way in improving specific Higher Educational programs tailored to rebuilding the country, such as encouraging more take up in civil engineering, corporate social responsibility and governance programs that can be developed working in close nexus with businesses and in collaboration with overseas partners.

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