

# The Necessity and Importance of the Feasibility Study in Developmental Projects in South Sudan – the case of SUDD Wetland and Juba – Bhr el Ghazal

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**Abstract:** *This research article intends to highlight the importance of feasibility study in designing any project, more importantly, major development projects such as roads and bridges. It is to examine the grounds for suspension Juba-Bhr el Ghazal Highway and its application in an upcoming project of the same kind. The country needs infrastructure development. Major developmental projects required serious assessment (feasibility study) carried out within a term not less than two years. About wetlands, interfering with the ecological character of the wetland is tricky, experiences in the construction of roads over wetlands are rare to find all over the world. The study finds that the exploration of oil and gas in wetlands needs a careful geological survey. To mitigate the impact of oil in wetlands is not expected therefore, production of oil in wetlands should be allowed as the first choice or be carried by the USA and UK in urgent need.*

**Keywords:** Feasibility Study, Roads and Bridges, Oil and Gas, Wetlands and Biodiversity Conservation, Environmental Impact Assessment, Developmental Projects.

## 1. Introduction

Planning for the implementation of a developmental project required prerequisite studies to address the future impact on the socio-environment. Nothing is more regrettable than demolishing an already constructed project to correct mistakes that should be done before the implementation of the project.<sup>1</sup>

The reason to do a feasibility study is to assess the positives and negatives of the upcoming project altogether<sup>2</sup>. The complete survey of the area and the related, help in determination about the possibility of implementing the project or rejection of the project base on the outcome of the feasibility study<sup>3</sup>. The feasibility study should be carried out within a period not less than two (2) years before the implementation of the project<sup>4</sup>.

The core aim of conducting a feasibility study is to determine the possibility of the implementation of the project<sup>5</sup>. Whilst, in the case of exploration of oil and gas, the case is different, it might take some years to determine the suitable drilling methodology<sup>6</sup>. However, a feasibility study in the oil and gas sector is meant to assess two major elements namely, socio-economic and socio-environment; the two are interrelated. Hence, major developmental projects have both elements<sup>7</sup>.

- Socio-economic
- Socio-environment
- Feasibility study in oil and gas or entire (petroleum and mining) sector
- Drilling methodology in SUDD Wetland

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<sup>1</sup> 'INTRODUCTION TO PROJECT PLANNING AND DEVELOPMENT Learning Objectives The Project Cycle An Overview of Project Planning'.

<sup>2</sup> Glenn Ballard, 'RETHINKING PROJECT DEFINITION IN TERMS OF TARGET COSTING Lean and Green View Project Linguistic Action Perspective View Project' <<https://www.researchgate.net/publication/252609919>> accessed 14 June 2022.

<sup>3</sup> *ibid.*

<sup>4</sup> *ibid.*

<sup>5</sup> *ibid.*

<sup>6</sup> *ibid.*

<sup>7</sup> Lulit Hailemeskel, 'A Thesis Submitted to the School of Graduate Studies of Addis Ababa University in Partial Fulfillment of the Requirements for the Degree of Master of Arts in Sociology' [2011] Control.

The long dispute concerning Juba – Bhr el Ghazal Highway is an open-ended debate<sup>8</sup>. Hence, the project was suspended in June 2020 over quality concerns – after a heavy downpour swept away some sections of the road<sup>9</sup>. The issue of Juba – Bhr el Ghazal road has nothing to do with the inexperience of the contractor nor is the quality of materials used for the construction of the road, however, associated with a lack of proper feasibility study especially environmental factors of the region<sup>10</sup>.

The purpose of this research article is to highlight the importance of a feasibility study before the implementation of the project<sup>11</sup>. Understanding the environmental elements of the areas is a matter of essence before implementation. Hence, implementation without due prerequisite assessment of the related factors is a complete waste the resources<sup>12</sup>.

## 2. Scope of Feasibility Study

The aim of the feasibility study as mentioned above within the context of this research article is to assess the future impact of the designed project on both socio-economic and socio-environment as follows:

1. To identify/find out the positive and negative impact of the project.
2. To come out with the mitigation measures.
3. To address expected changes in socio-economic and socio-environment, particularly the ecological character of the area.
4. Recommend a suitable method for the particular project (best practice for a specific project) for example a) High risk (negative), b) Less risk (positive).
5. To highlight universal best practices in the field.
6. General benefit despite expected pollution in future especially in oil and gas production.
7. Socio-economic aspects of the indigenous community(s).
8. Vegetation cover test to determine biodiversity in the areas of concern in addition to examination of types of soil, source of water (water body)
9. Flora and fauna, and,
10. Compensation.

Conducting feasibility studies with regards to road construction as well as in the exploration of oil and gas needs, and addressing ecological change is the matter of essence<sup>13</sup>. Monitor change in socio-economic imposed on surrounding community(s) can be estimated easily if dealt with scientifically as per the outcome of the feasibility study<sup>14</sup>.

The reason for the feasibility study is to assess (the cons and pros) of any project especially major development projects such as road construction, oil and gas exploration, etc. Implementation of such a kind of project without due feasibility study is the amount to a waste of money<sup>15</sup>.

The outcome of the feasibility study is the guidelines for implementation or suspension of the project<sup>16</sup>. Therefore, undertaking feasibility is mandatory. Whilst, there shall be comparative studies to be used as references to be referred to the implementation or suspension of the project as per the outcome of the study, particularly in the petroleum sector<sup>17</sup>.

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<sup>8</sup> Khidir Abdalla and Kwal Deng, 'FLOOD ANALYSIS AND SOCIO-ECONOMIC IMPACTS ON HOUSEHOLDS IN NORTHERN BAHR EI Ghazal STATE OF SOUTH SUDAN USING GIS AND SWAT MODEL AN MSc THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE IN HYDROLOGY IN DEPARTMENT OF GEOGRAPHY AND ENVIRONMENTAL STUDIES, UNIVERSITY OF NAIROBI 2018'.

<sup>9</sup> *ibid*.

<sup>10</sup> 'South Sudan Suspends Construction of Major Highway over Quality - The East African'

<<https://www.theeastafrican.co.ke/tea/news/east-africa/south-sudan-suspends-construction-of-major-highway-over-quality-1443018>> accessed 11 June 2022.

<sup>11</sup> Gael I Orsmond and Ellen S Cohn, 'The Distinctive Features of a Feasibility Study: Objectives and Guiding Questions'.

<sup>12</sup> *ibid*.

<sup>13</sup> Suhaila Alang Mahat, 'The Palm Oil Industry From The Perspective of Sustainable Development: A Case Study of Malaysian Palm Oil Industry' [2012] Ritsumeikan Asia Pacific University Japan 1 <<http://r-cube.ritsumei.ac.jp/bitstream/10367/4738/1/51210600.pdf>>.

<sup>14</sup> *ibid*.

<sup>15</sup> 'INTRODUCTION TO PROJECT PLANNING AND DEVELOPMENT Learning Objectives The Project Cycle An Overview of Project Planning' (n 1).

<sup>16</sup> *ibid*.

<sup>17</sup> 'South Sudan Suspends Construction of Major Highway over Quality - The East African' (n 10).

More importantly, a frank assessment concerning the effect of the project on socio-economic and socio-environment are required<sup>18</sup>.

### 3. Road Construction in South Sudan

South Sudan is one of the vast countries in Africa with a variety of environmental data. Hence, road construction in South Sudan faced a variety of challenges, the main threat to road construction is water all over the country<sup>19</sup>. Hence, road construction techniques in South Sudan are critical especially in Bhr el Ghazal and Upper Nile regions. However, in the Equatoria region, the situation might be different. Therefore, the construction of roads should be based on landforms or terrain of the particular area in South Sudan<sup>20</sup>.

It is worth mentioning that, some delays in the implementation of road construction all over the country are attributed to ecological implications of a particular area(s) for example Juba – Bhr el Ghazal and Juba – Upper Nile (Malakal). Construction of roads through wetlands is complicated if not impossible, however, it is not allowed for ecological justifications especially interfering with the ecological character of wetlands.

Hence, roads authority and other related authorities in the country are advised to seek scientific reports concerning the ecological character of different areas nationwide. The result of ignoring environmental data is costly as it's the case in the suspension of the Juba – Bhr el Ghazal highway in 2020<sup>21</sup>. Historical studies concerning the terrain of South Sudan recommend (River Transportation) as a priority for the southern region as means of interstate transportation. River transportation was successful and remains as such besides highways. The major national developmental projects required a thorough examination of different aspects especially the conservation of flora and fauna<sup>22</sup>.

The newly inaugurated bridge (Freedom Bridge) is a live example of the importance of a feasibility study in major developmental projects. The Road Authority's decision to temporarily close the bridge was right<sup>23</sup>. It is fashionable that, roads and bridges are interrelated, therefore, the construction of bridges without consideration of road extension is a rare case of its kind. It is worth mentioning that, the suspension of the Juba-Bhr el Ghazal Highway was not due to a lack of studies, not construction quality.

### 4. Conservation of Ecosystems of Sudd Wetlands

Sudd wetland is a national resource for current and future generations altogether<sup>24</sup>. Hence, exploitation of resources in Sudd Wetland is a solely national agenda. Luckily, the implementation of the Jonglei Project Area has not been completed due to many factors more importantly the Southern region's objection to the implementation of the project<sup>25</sup>. South Sudan acceded to international governing instruments through United Nations Environment Programme (UNEP), more importantly, Global Environment Facility (GEF)<sup>26</sup>.

The value of biodiversity in South Sudan is not well procured due to the scarcity of studies in the field. According to the directorate of wetland and biodiversity at the Ministry of Environment and inter-sectoral wetlands and biodiversity networking group (W&BNWG) as part of the implementation of the Ramsar Convention 1971 on the wetland<sup>27</sup>.

In addition, concerning the implementation of the Ramsar Convention, the Ministry of Environment, represented by the directorate of wetland and biodiversity is the designated national focal point for the Ramsar Convention and highlighted particular areas of concern more importantly establishment of the directorate. In addition, it recommends government agencies especially the Ministry of Education include environmental studies in the curriculum<sup>28</sup>.

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<sup>18</sup> 'Towards a Constructivist Understanding of Socio-Environmental Conflicts' <<https://researchrepository.murdoch.edu.au/id/eprint/59931>> accessed 14 June 2022.

<sup>19</sup> Infrastructure Plan, 'An Infrastructure Action Plan For South Sudan 3.2'.

<sup>20</sup> *ibid*.

<sup>21</sup> 'South Sudan Suspends Construction of Major Highway over Quality - The East African' (n 10).

<sup>22</sup> Plan (n 19).

<sup>23</sup> 'Roads Authority to Close One Lane of Juba Bridge Temporarily - Eye Radio' <<https://www.eyeradio.org/roads-authority-to-close-one-lane-of-juba-bridge-temporarily/>> accessed 11 June 2022.

<sup>24</sup> 'BIODIVERSITY AND CONSERVATION'.

<sup>25</sup> *ibid*.

<sup>26</sup> 'Protecting Biodiversity to Boost South Sudan's Economy - InfoNile' <<https://www.infonile.org/en/2021/07/protecting-biodiversity-to-boost-south-sudans-economy/>> accessed 18 April 2022.

<sup>27</sup> 'South Sudan: An Unexplored Eden of Biodiversity - France 24' <<https://www.france24.com/en/20200526-south-sudan-an-unexplored-eden-of-biodiversity>> accessed 18 April 2022.

<sup>28</sup> National Report and others, 'National Report on the Implementation of The' 1.

#### 5. Socio-economic

Ignoring the right of indigenous is one of the main obstacles to the implementation of any project (implementation of Jonglei Project Area) is an ideal example<sup>29</sup>. The project was carried out despite warnings about the impact of the project on ecosystems in general and biodiversity in particular<sup>30</sup>. The fact that the conclusion of a feasibility study concerning the project highlights that, implementation of the project is difficult for many reasons<sup>31</sup>.

No doubt that (water is food), therefore, taking away water from tributaries is equal to taking away the lonely source of food. The agreement over the drilling of the Jonglei Canal was concluded in 1974<sup>32</sup>, and the project was about to be imposed on the surrounding communities in particular and the southern region in general. Hence, those interested in environmental issues waned of severe environmental impact as the result of an ongoing proposed project<sup>33</sup>. Despite tough, the government in collaboration with foreign powers decided to proceed with the implementation of the project which caused great anger in the southern region and subsequently emerged a new armed conflict led by the People's Liberation Army/Movement (SPLA/M) in May 1983.

#### 6. Socio-environment

All man-made projects inevitably interfere with the natural composition of the environment. However, development is essential for the advancement of human life in different aspects<sup>34</sup>. There are some developmental projects friendly to the environment known as (green technology)<sup>35</sup>. The concept of socio-environment within the context of developmental projects means that living in a particular geographical location, imposes some feelings on that particular community, therefore, the decision for resettlement as recommended by the feasibility study for sake of implementing certain projects should address the means of adequate compensation<sup>36</sup>.

Payment of compensation may not be sufficient, however, the higher public interest prevails example construction of the dam. In this regard, of course, negatives are less in comparison with positives to be earned upon completion of the project<sup>37</sup>. However, in case the negative of the project are likely to damage both socio-environment the project should be cancelled whatsoever<sup>38</sup>. A feasibility study about the major developmental project should be done by (National Planning Council) in collaboration with scientists and specialists in related fields<sup>39</sup>. If the project is carried in the wrong time or under severe threat by foreign powers as it's the case in the High Dam construction of 1964 the outcome will be regrettable in the future<sup>40</sup>.

#### 7. Feasibility Study in Oil and Gas or entire (Petroleum and Mining)

Exploration of Oil and Gas was carried out by Chevron in 1979<sup>41</sup>. Chevron was granted a contract of discovering oil and gas, the contract come to an end in February 1984 as a result of the ongoing conflict between the government and SPLA/M<sup>42</sup>. Chevron was granted a concession contract to discover oil, however, upon completion of discovery, challenges concerning production were not discussed thoroughly.

At first, the government in collaboration with a partner in the production of oil prioritized getting as much as it can per day. It seems that the government in Khartoum together with its partners were aware of future geopolitics implication. The current method of exploration and production in the different oilfields in South Sudan, especially in block 3&7, are proved beyond a reasonable doubt,

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<sup>29</sup> John Garang, 'Identifying, Selecting, and Implementing Rural Development Strategies For Socio-Economic Development in the Jonglei Canal Projects Area; Southern Region, Sudan'.

<sup>30</sup> 'Ecology and Management of the Sudd Wetland' <<https://www.norad.no/en/front/funding/norhed/projects/ecology-and-management-of-the-sudd-wetland/>> accessed 18 April 2022.

<sup>31</sup> Garang (n 29).

<sup>32</sup> *ibid*.

<sup>33</sup> 'SOUTHERN SUDAN ENVIRONMENTAL THREATS AND OPPORTUNITIES ASSESSMENT BIODIVERSITY AND TROPICAL FOREST ASSESSMENT' <[www.irgltd.com](http://www.irgltd.com)> accessed 18 April 2022.

<sup>34</sup> 'Republic of South Sudan's National Adaptation Programme of Actions (NAPA) to Climate Change Ministry of Environment'.

<sup>35</sup> 'Republic of South Sudan National Adaptation Programmes of Action (NAPA) to Climate Change'.

<sup>36</sup> Ramsar Handbooks, 'Addressing Change in Wetland Ecological Character'.

<sup>37</sup> *ibid*.

<sup>38</sup> 'Sudan Cancels Dam Projects Threatening Nubian Culture - Al-Monitor: The Pulse of the Middle East' <<https://www.al-monitor.com/originals/2021/05/sudan-cancels-dam-projects-threatening-nubian-culture>> accessed 9 June 2022.

<sup>39</sup> Okuyama Tadahiro, 'Valuing the Recreational Benefits of Wetland Biodiversity' (2015) 7 International Journal of Biodiversity and Conservation 330.

<sup>40</sup> Boma-Badingilo Landscape and South Sudan, 'Conservation, Land and Natural Resource Management for Resilience, Conflict Mitigation, and Improved Livelihoods in The'.

<sup>41</sup> Tong Xiaoguang and Shi Buqing, 'Changing Exploration Focus Paved Way for Success' [2006] GEO ExPro 26.

<sup>42</sup> 'History of Oil in South Sudan | Fortune of Africa South Sudan' <<https://fortuneofafrica.com/southsudan/history-of-oil-in-south-sudan/>> accessed 9 June 2022.

the intention of the government and the partners to produce as much as it can within the shortest term possible regardless of environmental implications in future.

It has been necessary to conduct a proper assessment of major developmental projects on humans and the environment. About exploration and production of oil and gas in wetlands or nearby, it requires caution before starting because wetland is unique in many aspects, especially in terms of dissemination of pollution. Hence, current contractors on oil and gas are not recommended to work on oil in wetlands. More importantly, exploration of oil and gas in wetlands is not advisable for many reasons notably conservation of biodiversity.

#### 8. Drilling Methodology in Sudd Wetland

Drilling of oil and gas in Sudd wetlands is not advisable *prima facie*. However, there are some recommended drilling technologies if necessary required to carry out oil production in wetlands. Within the context of this research article, it indicated that current contractors lack the required technology to deal with wetlands' complexities<sup>43</sup>.

Complying with general rules and regulations of wetlands conservation required scientific consultation from relevant institutes such as academia among others<sup>44</sup>.

#### 9. Conclusion and Recommendations

It is important to repeat one more time the necessity to conduct a feasibility study to come out with a recommendation on whether the project will be conducted or cancelled. Of course, there is a need for reconstruction but should base on a scientific survey which is the most important aspect of any project.

Skipping an essential aspect of the project, a feasibility study, will result in a severe impact on the project's lifetime, perhaps suspension or cancellation of the project as it's the case in Juba-Bhr el Ghazal Highway and Freedom Bridge. As mentioned earlier within the context of this research article, a lack of data about a specific project is a waste of resources if conducted based on inadequate information.

Conducting feasibility is the headway for a successful project including city planning. However, about Sudd wetland and other developmental projects such as roads and bridges the case is different in many aspects. Wetland has its ecological character which predetermines special methods of interference with its composition for example construction of roads over the wetland.

In conclusion, generally, it's not advisable to construct roads over Wetlands or exploration and production of oil and gas by current companies, however, in case of urgent need, only the USA, and the UK can be entrusted for a concession contract to undertake production of oil in wetlands.

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<sup>43</sup> Washington, '2013 Wetland and Waterbody Construction and Mitigation Procedures'.

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