



Land and Sea: Integrated Assessment of the Temaiku Land and Urban Development Project in Kiribati

Anthony Kubale

Senior Environmental Consultant, Jacobs New Zealand

Background

Kiribati, an island republic in the Central Pacific, is one of the world's most economically and physically vulnerable countries, consisting of 33 low lying coral atolls scattered over 3.5 million km². At their highest elevation, the atolls average 1.8 metres above sea level. Of its 110,000 inhabitants, half live on the capital island of South Tarawa making it one of the most densely populated areas in terms of number of persons per km². Tarawa's land and people are increasingly impacted by sea level rise and the frequency of storm surge and king tide inundation. Its population is rapidly growing due to migration from the outer islands, placing pressure on natural resources, infrastructure and essential services. Other climate change induced effects such as increased rainfall, droughts and ocean acidification are also contributing factors making Kiribati highly vulnerable.

Over the next eight decades, the United Nations Intergovernmental Panel on Climate Change (IPCC) projects a 0.9 metre increase in global sea levels. Kiribati's surrounding sea levels are predicted to rise by up to 0.17 metres by 2030.

Jacobs New Zealand Limited (Jacobs) was commissioned by the New Zealand Government Ministry of Foreign Affairs and Trade (MFAT), on behalf of the Government of Kiribati (GoK), to assess the feasibility of reclaiming 300 hectares (Ha) of inhabitable land on the Temaiku Bight in the Kiribati capital, Tarawa. The reclamation will increase the height of the land by approximately two metres above the highest measured sea level, allowing for an urban development for up to 35,000 people, resilient to predicted 2200 sea levels.

The vision for GoK across Kiribati is to strive "towards a better educated, healthier, more prosperous nation with a higher quality of life".



Project Overview

Our approach was to develop a deep understanding of the island of South Tarawa as a whole. While the project is primarily driven by a need to create new, higher, habitable land at the Temaiku Bight. It also seeks to address other key issues that affect the GoK and the daily lives of its people. The opportunity to establish a new urban development unlocks potential for GoK to address overarching environmental, social and economic issues.

The team used a triple bottom line sustainability approach to explore integrated engineering and infrastructure outcomes. The investigations comprised coastal engineering, urban and landscape design and environmental and social impact assessment. A series of strategies were formed during multi-disciplinary design workshops, drawing upon Jacobs architecture, environmental, social planning and engineering disciplines to address the key issues facing Tarawa, and to enhance the project's feasibility.

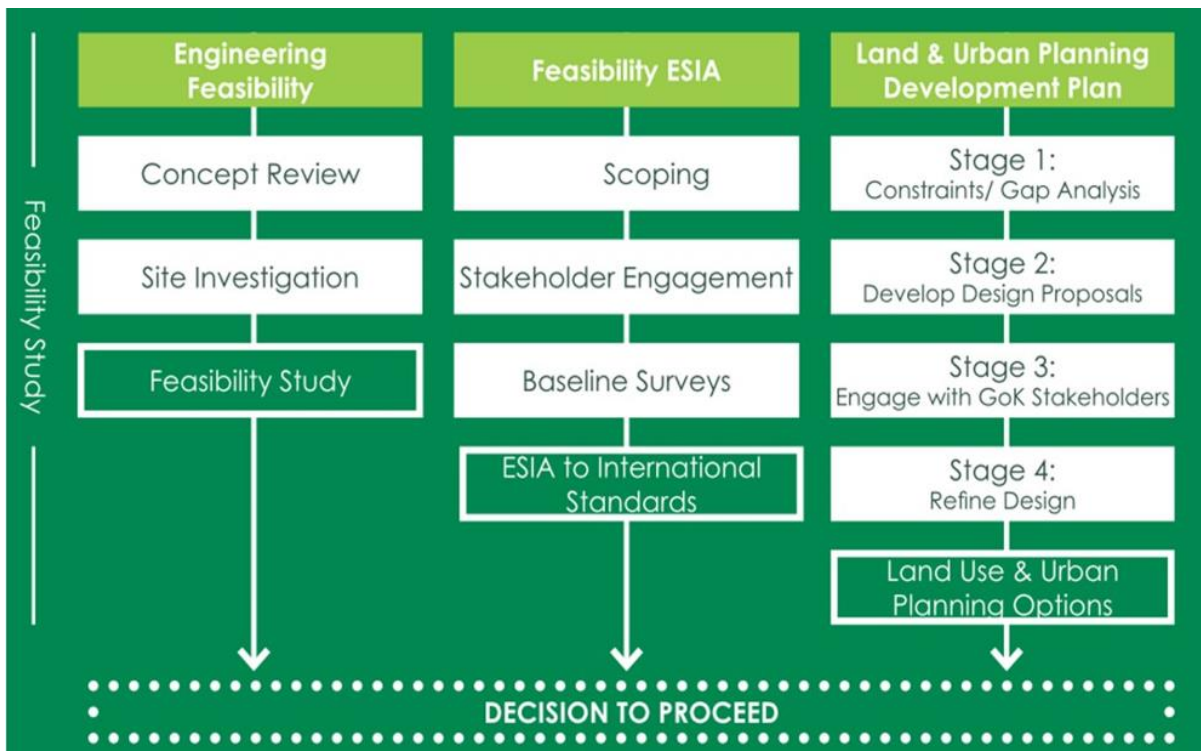
In addition to the feasibility study, the team developed an accompanying conceptual land use master plan that addresses resilience issues impacting the atoll, including rapid urbanization, limited water supply, ecosystem services and an increasing risk of land inundation from king tides.

The project is the first large scale climate change adaptation project of its kind for a small island developing state and culminated in the President of Kiribati presenting the Project at the 2017 UN World Climate Change Forum, CoP23 in Bonn, Germany.

Impact Assessment Approach

The project comprised three key streams of work, as outlined in the figure below, which ran in parallel. Together they were to provide an understanding of the feasibility of the project and inform the decision of whether to proceed.

The impact assessment approach was critical in understanding the existing environment and social context, identifying the key environmental and social impacts, identifying solutions to minimise impacts through informing design and mitigation measures, and promoting environmental and social benefits. A key component was stakeholder engagement with local communities across all three streams of the feasibility study and throughout the ESIA. Ensuring the local communities were informed about the project and were able to provide input to the feasibility study process was critical in ensuring a successful outcome that reflected the vision of the Kiribati people.



It is important to recognise at this point the role that the Secretariat of the Pacific Regional Environment Programme (SPREP) has in providing EIA capacity building across the Pacific region. SPREP has produced guidelines for conducting environmental impact assessment for Pacific Island Countries and Territories and is an important source of information for SIDS conducting EIA.

The ESIA process for this project was undertaken in accordance with the World Bank Environmental and Social Framework and comprised a number of key stages as outlined in the Figure above. The ESIA comprised a series of Volumes: Introduction, EIA (Terrestrial), EIA (Marine), Social Impact Assessment, Environmental and Social Management Plan (ESMP) and Technical Appendices.



In the ESIA process for this feasibility project, the 'Scoping Stage' was key in 'scoping in' those environmental and social impacts that would need to be considered going forward whilst 'scoping out' any elements not considered to be impacted by the project. During the Scoping Stage a Stakeholder Engagement Plan was also produced which captured the approach for engaging with all project stakeholders throughout the ESIA process.

Whilst utilisation of existing data from historical studies was used as far as possible, the Baseline Stage was necessary to fill any gaps in knowledge and provide an update to date picture of the existing environment. To do this, a number of in-country surveys were undertaken including for example air quality monitoring, terrestrial and ecological surveys, potable groundwater monitoring, noise monitoring etc.

Data collected from the Baseline Stage along with historical information was taken forward into the ESIA Stage. In order to determine the relative significance of impacts, a bespoke impact matrix was developed that considers sensitivity/vulnerability versus magnitude of impact. Impact matrices form a core component of assessing impacts utilising qualitative and quantitative information.

For any negative impacts identified during the assessment process, suitable mitigation measures were recommended to minimise these impacts to acceptable levels. Recommendations for monitoring was also made to be able to track changes to the environment and determine the success of the mitigation measures. The mitigation measures and monitoring recommendations were captured in the Environmental and Social Management Plan (ESMP). A framework Environmental and Social Management System (ESMS) was also produced which provided the means by which to implement the ESMP effectively.

Finally, a Non-Technical Summary was produced which captured the entire ESIA process and outputs in a concise summary written in lay terms for ease of reading for the general public.

The Future?

The project in its essence is transformative to improve quality of life and climate change resilience in South Tarawa and Kiribati as a whole. The desire of the project team was to be able to provide a potential blueprint for large scale climate change adaptation across SIDS in the Pacific.

The project was found to be feasible from an engineering, environmental and social perspective, however, the costs for undertaking a project of this scale are significant and where this finance would come from is a key question. If the Project is to go ahead further investigations would be required to further understand the potential environmental and social impacts. A final remark is that Community Engagement is the key to success for impact assessments in general but particularly for a project such as this.



References and Acknowledgements

SPREP (2016), Strengthening Environmental Impact Assessment. Guidelines for Pacific Island Countries and Territories.

<https://www.sprep.org/attachments/Publications/EMG/regional-eia-guidelines.pdf>.

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