

CLIMATE CHANGE VULNERABILITY ASSESSMENT FOR AMERICAN SAMOA: FOCUS ON TRANSPORTATION INFRASTRUCTURE

Jessica H. Podoski, P. E., US Army Corps of Engineers, Honolulu District, jessica.h.podoski@usace.army.mil
Dane Sjoblom, HHF Planners, Inc., dsjoblom@hhf.com
Shelley Franklin, HHF Planners, Inc., sfranklin@hhf.com

INTRODUCTION

Essential transportation infrastructure around the globe will be increasingly compromised by interrelated climate change impacts. Due to geographic isolation and limited natural resources, the economy and security of many Pacific territories and nations, including American Samoa, depend heavily on the resilience of these transportation infrastructure systems. Of particular relevance are the coastal impacts of climate changes such as sea level rise and storm surges which will threaten transportation infrastructure including both temporary and long-term flooding of airports, ports and harbors, and roads which are vital lifelines for trans-Pacific, interisland, and inraisland commerce and community services. The majority of the transportation assets in American Samoa are along a narrow coastal plain backed by steep topography, precluding relocation or retreat in response to increased coastal flooding accompanying a changing climate.

STUDY OBJECTIVES

The objective of this study, completed by the US Army Corps of Engineers (USACE) and its industry partner HHF Planners for the American Samoa Government (ASG), is to identify key transportation infrastructure, their functions and status in order to provide an overall picture of relative vulnerabilities to climate-related stress and induced events in American Samoa. This study was conducted to provide important information on the sensitivities and exposure of critical transportation systems and the adaptive capacities of these systems and to provide mitigation concepts that can contribute to the Territory's climate change adaptation framework.

STAKEHOLDER ENGAGEMENT

An important aspect of assessing a system's vulnerability to climate stress is the ability of its social infrastructure to adapt to these environmental changes. Assessing the relevant social impacts of climate change on transportation systems encompasses a complex suite of factors which include land ownership systems, cultural demographics, and enabling legislations for preparedness of hazards. This was completed through participatory meetings with stakeholders including Federal and Territorial government agencies, existing stakeholder groups, and village leaders.

VULNERABILITY AND ADAPTATION

Input from stakeholder meetings was used in combination with several other factors, including anticipated exposure and resiliency to climate change hazards, to develop a transportation assets vulnerability index. The index provides a framework to quantify risks and identify the most vulnerable transportation assets for

prioritization. Several assets deemed high priority by ASG were selected for development of potential climate change adaptation strategies. The adaptation strategies were translated to conceptual level designs and associated rough order of magnitude construction cost estimates using existing infrastructure specifications and recent territory construction cost information. The intent is that these conceptual designs and cost estimates can be further refined in follow-on studies, used for planning estimates, and translated to action by local agencies.



Figure 1 - Stream outfall and low-lying coastal highway in American Samoa

GEOSPATIAL PRODUCTS

In addition to conceptual designs and cost estimates for adaptation strategies, a Federal Geographic Data Committee compliant geodatabase of collected and generated geospatial data was provided to ASG as part of this study. This database may be used by the ASG for continued climate change adaptation and resiliency planning, emergency management, stakeholder outreach, and advocating for policy changes needed to prepare for future anticipated impacts to transportation infrastructure.

This presentation will include discussion of the findings of the study, the methods used for stakeholder input and vulnerability indices, lessons learned, and applicability to other locations facing similar challenges, particularly those in the Pacific Ocean basin.