論 文 の 内 容 の 要 旨

論文題目 Title of Doctoral Dissertation:

ADAPTATION TO SEA-LEVEL RISE FOR COASTAL RURAL ISLAND COMMUNITIES:
A CASE STUDY FROM THE SAMOAN ISLANDS

（島嶼国における沿岸地域コミュニティの海面上昇適応:サモア諸島の事例から）

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Thesis summary

The inevitability of sea-level rise has created much scientific discussion about the possibility of climate-induced migration or displacement of coastal settlements. Adaptation will be essential, as rising seas will continue into the foreseeable future even if the emission of greenhouse gases can be halted, and temperatures stabilized. Sea-level rise will largely affect communities in low-lying areas around the globe, from mega-cities to Small Islands Developing States (SIDS), and even rural settlers. Despite numerous studies suggesting migration away from coastal areas will become an adaptation mechanism, there is little actual evidence of relocation taking place. Many communities, including low lying atolls such as Kiribati and Tuvalu that are well studied, are reluctant to move, even though they are already experiencing tidal flooding during annual king tides. Additionally, there are limited empirical studies that focus on mountainous SIDS and their coastal communities, such as Samoa.

Samoa is one of the SIDS in the Pacific Ocean, consisting of two islands (Upolu and Savaii) and eight smaller islands, three of which are inhabited. It has a total landmass of approximately 2,944 km2 with a total current population estimated at 201,098. The two main islands are where the majority of the population can be found, with more than 70% living within a 1 km zone of the coastline. This fact makes Samoa highly vulnerable to the pernicious effects of climate change, and the knock-on effects of sea-level rise. Furthermore, Samoa, and especially its rural communities, are deeply rooted in its traditional systems and culture. The existence of these traditional decision-making bodies

and indigenous traditional knowledge means that, coupled with climate data deficiencies and localized understanding of climate risks, adaptation options, and potential migration pathways, designing appropriate adaptation strategies represents a difficult task.

A myriad of adaptation projects have been undertaken in Samoa, employing a top-down approach on the assumption that this would increase effectiveness, but with little to no long-term success. However, given that local decision-making structures are impervious to national policies, a degree of mismatch between national policy and grassroots decision-making exists. Localized adaptation and understanding of adaptation pathways could lead to dependency reduction and autonomous adaptation that are more sustainable.

Addressing these gaps requires a place-based understanding of climate change that involves local impacts and vulnerabilities, strengths, and adaptive capacity to demonstrate effective adaptation. This study uses a case study approach, examining rural island communities in Samoa. The study sites are three coastal communities in Gagaemauga III district, on Savaii, the biggest island in the Samoan archipelago. These three communities are projected to be extensively flooded by rising seas by the end of the century under multiple Representative Concentration Pathways (RCP), except the lower RCP 2.6.

The Alliance of Small Island States (AOSIS), which includes Samoa, fought hard for a 1.5° C temperature limit agreement at the Paris Accord. However, despite this global milestone achievement, global dilatory intervention since the agreement will like result in surpassing this temperature cap goal. This fact coupled with the inevitability of sea-level rise even if we achieve zero-emission today would make adaptation an important step to addressing the climate impacts, especially that of sea-level rise.

The key questions that the candidate's thesis will aim to answer are: How will rural island communities address a slow-onset disaster such as sea-level rise? How would traditional communities plan towards a distant future if they were presented with scientific data on sea-level rise?

To investigate this, a multimethod research approach was undertaken. The study included a field visit, coastal surveys (including the use of remote sensing equipment), household surveys, and a Participatory Approach with the incorporation of Focus Group Discussion (FGDs).

The study shows that these communities have had a history of experiences with disasters, and despite them continue to rebuild in low-lying areas, undeterred by climatic-risks. To address future risks, the communities are willing to use multiple adaptation methods of protection and accommodating, before resorting to retreating from their current settlements. Thus, contrary to the popular idea of mass migration and community abandonment, rural island communities are reluctant to abandon their village settings and leave the

idea of a full-scale relocation as a last resort strategy. Furthermore, the communities are opting for an 'extensive settlement' (involving the construction of secondary homes inland, which are marked as disaster evacuation homes), which can address concerns of climate-risks from both sudden-onset and slow-onset disasters. By reducing the investments they make in the coastal area of their settlement, communities will be able to divert resources to inland regions. Environmental factors, even severe sea-level rise, will most likely not cause the collapse or abandonment of these communities into the near future.

Other findings regarding traditional decision-making bodies, such as the Council of Chiefs (Fono a Matai), show that these can facilitate a community-lead relocation process. However, traditional practices and designs were not considered as adaptation mechanisms by the communities, probably due to the loss of indigenous traditional knowledge on risk management infrastructure. In addition, the study found a predisposed linkage between gender, age, and particular adaptation pathways. For example, one of the findings shows that women (including youth in both sexes) prefer ecosystem-based adaptation while men, who have decision-making roles, favor hard solutions such as coastal walls. Differences in adaption preferences between women, youth, and untitled men, and that of matai are not represented in the decision-making body, the fono, in which the matai only have the privilege to speak. There are notable differences in adaptation preferences between women, youth, and untitled men, which has, in many cases, led to these groups being marginalized during decision-making processes.

Overall, the main illation of this study is that holistic localized understanding is necessary for identifying climate change adaptation pathways and that community-led discussion will facilitate a more sustainable response to addressing climate change.

This thesis is divided into seven chapters. Chapter one contains the introduction. Chapter two will cover the background, research framework, and methodology taken to answer the research questions and objectives of this research. Furthermore, it includes a section on the study site, explaining the logic behind the focus on rural island communities. Chapters three to five will discuss the results and findings of the different methods used. Each chapter focuses on a specific method which are, the Digital Elevation Mappings and SLR inundation maps using remote sensing technologies, household surveys, and a participatory approach, respectively. Chapter six will discuss the findings and limits to adaptation. Finally, Chapter seven will outline the conclusions and areas of possible future research.