

Climate Change Adaptation Options in Atoll Countries



Mikiyasu Nakayama

CEO, Global Infrastructure Fund Research Foundation Japan

This presentation is based on the following academic article.

Paper:

Alternatives for the Marshall Islands to Cope with the Anticipated Sea Level Rise by Climate Change

**Mikiyasu Nakayama^{*1,†}, Ryo Fujikura^{*2}, Rie Okuda^{*3}, Mai Fujii^{*4}, Ryuta Takashima^{*5},
Tomoya Murakawa^{*1}, Erika Sakai^{*1}, and Hiroaki Iwama^{*1}**

^{*1}Global Infrastructure Fund Research Foundation Japan

Roppongi T-Cube 14F, 3-1-1 Roppongi, Minato-ku, Tokyo 106-0032, Japan

[†]Corresponding author, E-mail: m.nakayama@gif.or.jp

^{*2}Faculty of Sustainability Studies, Hosei University, Tokyo, Japan

^{*3}Graduate School of International Cooperation Studies, Kobe University, Hyogo, Japan

^{*4}The Ocean Policy Research Institute, The Sasakawa Peace Foundation, Tokyo, Japan

^{*5}Department of Industrial Administration, Tokyo University of Science, Chiba, Japan

[Received September 21, 2021; accepted December 21, 2021]

Source: Nakayama, M., Fujikura, R., Okuda, R., Fujii, M., Takashima, R., Murakawa, T., ... & Iwama, H. (2022). Alternatives for the Marshall Islands to cope with the anticipated sea level rise by climate change. *Journal of disaster research*, 17(3), 315-326.

“Right to Stay” and “Right to Move”



- It has been warned that up to 1.2 billion people worldwide could be displaced as climate migrants by 2050.
- These climate migrants should have the "**right to stay**", i.e. the right to remain in their home countries in addition to the "**right to move**".
- What are the pros and cons of these two options?

Four Alternatives

Climate Change Adaptation Measures in Atoll Countries



Hulhumale Development ➔

Moving abroad

- Migration to the developed world.
- Migration to other island states.

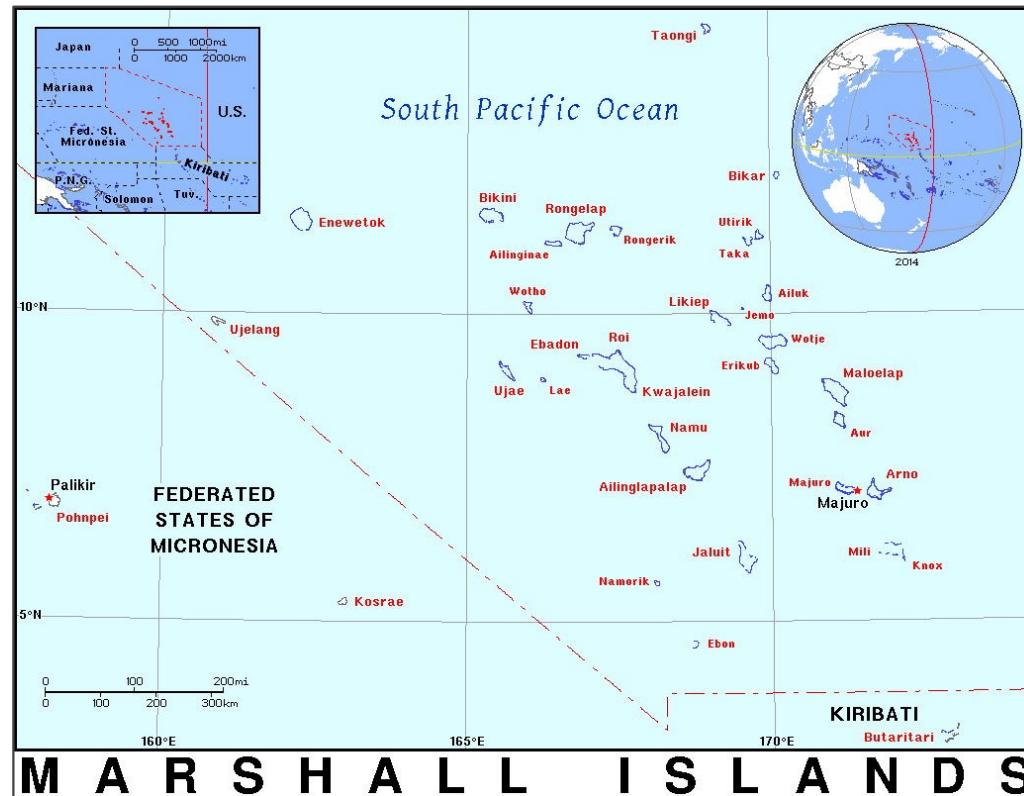
Staying in their own country

- Development of an artificial island (land reclamation and raising).
- Development of floating platforms.

Study Area - Republic of the Marshall Islands

- The Republic of the Marshall Islands (RMI) is **one of four atoll countries** in the world consisting entirely of low-lying land approximately 2 m above sea level.
- The RMI is thus **highly vulnerable to rising sea levels** due to climate change.
- Our study aimed to clarify the **relative advantages and disadvantages of possible four climate change adaptation alternatives** for the Marshallese in their home country.

Republic of the Marshall Islands (RMI)



Population: 78,000 (53,000 in the country; 300,000 in abroad)
Mean attitude of lands: about 2m (above Mean Sea Level)



Majuro Atoll (Capital)

Methods: Literature review and expert opinion

- We evaluated the performance of the **four alternatives**, with **16 criteria** representing the societal conditions that would result from each alternative.
- We rated the performance of each alternative per criterion from 1 to 5 (3 is status quo) by **literature review, interviews with researchers** who work on the livelihood of Marshallese immigrants in the U.S. states of Arkansas, Hawaii, and Oregon.
- We **interviewed people (not researchers)** who are knowledgeable about Marshallese behavior both in their home country and in the United States as immigrants.

Migration to the developed world



Dec 16, 2018
6:22 PM
EST

HILDA HEINE (a former President of RMI):

There have been people **who leave for education, for health purposes, for jobs**, and I'm sure there are people who are leaving because of the threats of **climate change**.

MIKE TAIBBI (Journalist):

There's another reason **they're moving to the United States — where the Marshallese community currently numbers around 30,000**. Citizens of the Marshall Islands can live and work in the U.S. without visas and work permits.

Source: <https://www.pbs.org/newshour/show/marshall-islands-a-third-of-the-nation-has-left-for-the-us>

Four alternatives were evaluated according to 16 criteria

Criteria	Alternatives			
	<i>Migration to the developed world</i>	<i>Migration to other island states</i>	<i>Land reclamation and raising</i>	<i>Developing floating platforms</i>
Housing	3	2	4	3
Purchasing power	3	3	4	4
Food security	4	3	3	4
Safety	3	3	3	4
Education	5	4	4	4
Social services	5	2	4	4
Health care	5	4	4	4
Employment	3	2	3	4
Participation in local activities	2	2	2	2
Climate	4	3	3	3
Living environment	5	3	4	4
Relationship with neighbors	3	2	2	2
Convenience of shopping	4	4	4	4
Access to amusements	5	4	4	4
Relationship within working place	2	2	3	3
Communications with others (casual issues)	2	2	3	3

Results

- By summing up the score of all the criteria, the four alternatives yielded (on average) **3.63, 2.81, 3.38, and 3.50**.
- Summing up the difference between “status quo (i.e., three points)” and the points assigned to each criterion, the four alternatives averaged **1.00, 0.69, 0.63, and 0.75** points.
- This suggests that **“migration to the developed world” offered more changes** to migrants than other alternatives, while the alternative of **“land reclamation and raising” offered the smallest change** to future climate migrants.

Conclusions

- The “migration to the developed world” alternative proved the best choice, followed by “developing floating platforms,” “land reclamation and raising,” and “migration to other island states.”
- We also found that “migration to the developed world” offered the most societal change to immigrants.
- The alternative of “land reclamation and raising” resulted in the smallest societal change.
- The magnitude of anticipated societal change should be given due considerations in evaluating alternatives.

Issues to be discussed

- ✓ First of all, what is the **point of preserving some land** of a nation?
- ✓ Are the **environmental impacts** acceptable?
- ✓ Should we respect the **"right to stay"** by developing artificial islands?
- ✓ Who will bear the **cost of developing artificial islands**?
- ✓ How should **differences, cultural or otherwise, be addressed** between people from different regions?
- ✓ Should migrants from the same region be **"clustered" or "dispersed"** ?
- ✓ As sea level rises, more people will **migrate unwillingly** rather than voluntarily as they do now. How should this issue be addressed?

**Thank you for
your attention!**

