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### Climate Change Induced Migration, Solutions & Implications

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# Climate Change Induced Migration, Solutions & Implications

Davidson Honors College

Honors Capstone Project

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Honors Capstone Project

Davidson Honors College

## Climate Change Induced Migration, Solutions & Implications

The scale and magnitude of the climate issue is continuing to escalate at an alarming and rapid rate. Estimates from only a decade ago are proving to underestimate the rate of changes that are affecting our planet. The premise of the argument presented in this paper will not debate the existence or root causes of anthropogenic climate change. But more so will accept the scientific consensus so we can move beyond debating the existence of anthropogenic climate change and have a robust discussion. Human behavior is influencing and exacerbating the natural processes that govern this planet. Mankind's behavior is causing changes in the atmospheric composition of our planet, the frequency and intensity of catastrophic weather events, the average surface and ocean temperature, net albedo, and sea ice coverage of Earth. The aforementioned list is far from exhaustive. The total implications of these side effects are still undetermined. And, the extent of influence due to human activity is too vast to cover in a single paper. That said, specific salient issues can be drawn from the climate issue and addressed if the political will and adequate information is presented to the appropriate stakeholders. As such, the issue of current and future climate refugees will be outlined, exemplified and creatively addressed in the ensuing literature.

In order to adequately understand the issue of migration caused by environmental displacement, it is first paramount that the scale and potential of the issue is outlined. In the simplest and most understandable terms; our planet's natural environmental state is being altered due to human activity. The common thread of argument you, the reader, may be familiar with is that the average global temperature is on the rise. In the early 2000's the general rhetoric being spread was the threat of 'global warming'. Although temperature is a good means of measuring the rate of change it is not the only means. The extent of environmental degradation is not limited to increasing temperatures. It includes but is not limited to: rising sea levels, ocean acidity, coastal shoreline erosion, decreasing agricultural production, forest degradation, access to freshwater, and increases in the frequency and intensity of catastrophic weather events such as wildfires, hurricanes and typhoons. All of these events will displace people if not addressed or mitigated. The paradigm of rhetoric revolving around this issue shifted from global warming to a more encompassing term, climate change.

Predicted amounts of sea level rise (SLR) alone will account for huge numbers of displaced people. Global coastal populations currently total more than 600 million. This number is projected to surpass one billion people by the end of the century.<sup>1</sup> As such, any level of SLR is expected to impact and displace large populations of people thus creating mass migration. Global sea levels have already

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<sup>1</sup> *Factsheet: People and Oceans* [Pamphlet]. (2017). New York, NY: The Ocean Conference: United Nations, New York.

risen by approximately 0.2 meters or 7 inches since 1900<sup>2</sup> and projections are showing a continued rise under anthropogenic warming. However, estimates of future sea-level rise vary widely. Future estimates rely heavily on human emissions in the coming decade. For example, current projections for the year 2100 range from the low end of 0.4 meters or 15 inches to the high end of 2.5 meters or 8 feet.<sup>3</sup> Like most predictions the actual number likely lies somewhere in the middle. When researching I commonly found estimates of 6 feet of sea level rise by 2100. In large part, this all depends on future greenhouse gas emissions, thermal expansion, and the melt of the Antarctic and Greenland ice sheets. By 2100 low-end estimates of sea level rise could displace roughly 87 million people. Considering the more dramatic predictions of sea level rise as many as 630 million people could be displaced by the end of the century.<sup>4</sup> Again, this depends on our policy direction and personal actions over the next 10 to 20 years. To put this number to scale, compare the potential number of 630 million refugees to the contemporary Syrian refugee crisis. According to the United Nations High Commissioner for Refugees (UNHCR) there have been roughly 5.6 million people who have fled Syria since 2011.<sup>5</sup> The political viability of accepting even small numbers of the Syrian migrants has been challenging. Given that the driving force of migration is different, the implications

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<sup>2</sup> Dobson, J. (2019, November 25). Shocking New Maps Show How Sea Level Rise Will Destroy Coastal Cities By 2050. Retrieved October 4, 2020, from <https://www.forbes.com/sites/jimdobson/2019/10/30/shocking-new-maps-show-how-sea-level-rise-will-destroy-coastal-cities-by-2050/>

<sup>3</sup> Ibid.

<sup>4</sup> Ibid.

<sup>5</sup> United Nations High Commissioner for Refugees. (n.d.). Syria emergency. Retrieved October 30, 2020, from <https://www.unhcr.org/en-us/syria-emergency.htm>

of accommodating a much larger number of refugees due to SLR will still be immeasurably more difficult.

One of the largest barriers to directly accounting for displaced migrations caused by anthropogenic climate change is the difficulty of attribution. It is difficult to directly connect human induced environmental effects to displacements. It is inherently difficult to attribute a single instance of mass displacement or the single instance of a catastrophic weather event to human action. This is because catastrophic weather events (hurricanes, typhoons, wildfires, etc) are naturally occurring. Therefore, the ensuing need for populations of people to move is also natural. Human displacements due to weather and environmental changes have been occurring for thousands of years. That said, the frequency and intensity of these events has increased dramatically in recent human history. For instance, the number of “extreme weather event attribution studies” has increased substantially in the past eight years alone. Specifically, in all years prior to 2012 there were only 17 studies by acclaimed publishers relating to extreme weather events attributed to humans. In 2019 alone, there were over 80 studies relating to the same sort of weather events.<sup>6</sup> Although this increase in studies could be sparked by a keen new interest of scientists in climate change as a whole. There is still an appetite for this type of research because of the increase in significance and magnitude of catastrophic weather events. Although an increase in scientific studies does not

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<sup>6</sup> Mapped: How climate change affects extreme weather around the world. (2020, April 21). Retrieved October 21, 2020.

directly display an increase in these weather events, it still demonstrates a change, by scientists, in the mode of thinking about displacements.

Even though it has been difficult to attribute singular weather events that displace people, specific examples are beginning to emerge that are becoming harder to refute the influence of human action. The most widely acclaimed ‘first example’ of climate change induced displacement is that of the Carteret Islands in Papua New Guinea. This low lying group of seven island atolls sits at only 1.2 meters or 3.9 feet above sea level. Since 1994, the islanders have already lost an estimated 50% of its landmass.<sup>7</sup> In 2005 the island nation gained national attention due to their plight. The islanders who were forced to leave were named the world’s first “climate refugees”, a label “inspired by those who seek asylum under the Geneva Convention”.<sup>8</sup> Fourteen years later, since their initial recognition, the islanders are still in a troubling situation. The level of the impacts continue to mount against the low lying atoll.

The impacts afflicting these specific atolls will parallel with future externalities affecting other islands in similar environments as the Carterets. The two main implications will be SLR and increased storminess. Both will contribute to coastal erosion, flooding and salinity intrusion.<sup>9</sup> Ultimately, this will reduce the

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<sup>7</sup> Sarah M. Munoz Doctoral researcher in Political Science / Doctorante en Science Politique, Munoz, S., & Doctoral researcher in Political Science / Doctorante en Science Politique. (2019, June 11). Understanding the Human Side of Climate Change Relocation. Retrieved November 08, 2020, from <https://www.resilience.org/stories/2019-06-11/understanding-the-human-side-of-climate-change-relocation/>

<sup>8</sup> Ibid.

<sup>9</sup> Connell, J. (2016) Last days in the Carteret Islands? Climate change, livelihoods and migration on coral atolls. *Asia Pacific Viewpoint*, 57: 3– 15. doi: [10.1111/apv.12118](https://doi.org/10.1111/apv.12118).

“resilience and viability of small island ecosystems”.<sup>10</sup> Populations who are unwillingly forced from their homeland will become environmental refugees. Instances such as these break down the barrier of attribution and shed light into humanizing instances of climate change induced migration. The Carteret Islands have gained so much publicity because they are the first of their kind. I found Brian Merchant’s note especially salient:

“The day has finally come and a critical landmark in the saga of global climate change is occurring – and hardly anyone has noticed. The Carteret Islanders of Papua New Guinea have become the world's first entire community to be displaced by climate change. They're the first official refugees of global warming – and they're packing up their lives to move out of the way of ever-rising waters that threaten to overtake their homes and crops. The island they call home will be completely underwater by 2015”.<sup>11</sup>

As powerful as Merchant’s statement is, it is important to note that the islands are not yet completely submerged. As of 2018, roughly 1,800 Tuluun people still reside in the small chain of islands.<sup>12</sup> That said, within the next decade they are expected to have vacated their home. Not only will their physical homeland be lost, but over two hundred years of a rich cultural heritage will drown along with the place that they resided.

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<sup>10</sup> Farbotko, C. (2010) Wishful sinking: Disappearing islands, climate refugees and cosmopolitan experimentation, *Asia Pacific Viewpoint* 51(1): 47– 60.

<sup>11</sup> Merchant, B. (2014) First official climate change refugees evacuate their island home for good. Retrieved 18 March 2014.

<sup>12</sup> Ibid.

Although the Carteret example is the first acclaimed instance of displacement due to anthropogenic climate change, more are beginning to emerge. It is important to understand the humanity behind these instances. One of the largest barriers to motivating human action to the climate issue is the physical and mental distance to the problem. It is easy for an individual to shake off the implications of their actions if they are unaware that the effects are beginning to plague other people in a very real and graphic manner.

One of the most disturbing examples I found is that of the Lateu village in Vanuatu. In the same relative region of the Carteret Islands, Lateu Village is due east off of the northeastern coast of Australia. A similar physical environment to the Carterets, a small cluster of islands situated around a coral reef atoll. Over the past decade, the effects of changing oceans have been devastating to the island's ecosystem and subsequently the people who live there. An unprecedented typhoon wiped away the island's only beach a few years ago leaving only a "handful of squalid thatched huts stand[ing] forlornly on its coastline".<sup>13</sup> The few palm trees on the island are dying as frequent floods are washing away their root systems. According to the 63 year old local village head, Reuben Seluin "at the end of the Eighties, our village flooded for the first time. Nowadays it happens every other month".<sup>14</sup> Of the structures that are still standing an unpleasant mould covers the ground that is negatively affecting the residents health. Because this population of

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<sup>13</sup> Boehm, P. (2011, September 22). Global warning: Devastation of an atoll. Retrieved November 09, 2020, from

<https://www.independent.co.uk/environment/global-warning-devastation-of-an-atoll-413922.html>

<sup>14</sup> Ibid.

people is so small the Canadian government has voluntarily stepped in to help relocate the village inland a few hundred meters. Although a sustainable solution has been found for the residents of Lateu village, there are countless island cultures in Indonesia that are extremely susceptible to rising sea levels and increased frequency of typhoon and flooding. The frequency of these events will only grow in the future and it is unlikely that richer nations will continue to step in and provide solutions for larger groups of people. Hence, there is a dire need for global action and a more encompassing, sustainable solution.

In order to prove that this is not a regional problem, but rather a global issue is important. Two more contemporary examples of climate change induced displacement from other parts of the world will be outlined. First, the Shishmaref village on Sarichef island in Alaska is disappearing at an alarming rate. The Shishmaref village example was the only I could find in North America acutely related to displacement. Similar to the previous two examples, the Alaskan island village is being quickly altered by a changing ocean. Coastal erosion is occurring at an alarming rate. Historically, sea ice would form along the coast in late October according to local resident, Kate Kokeok.<sup>15</sup> Now, the sea ice forms later into the winter season leaving the coast vulnerable to the intense waves created by winter storms. Further, the village has been steadily losing its permafrost which has also made the coastline more perceptible to erosion.<sup>16</sup> Sarichef Island lost an average of

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<sup>15</sup> Martin, A. (n.d.). An Alaskan village is falling into the sea. Washington is looking the other way. Retrieved November 10, 2020, from <https://www.pri.org/stories/2018-10-22/alaskan-village-falling-sea-washington-looking-other-way>

<sup>16</sup> Ibid.

seven and a half feet of land per year to erosion between 2003 and 2014. In 2005 the Army Corps of Engineers built a sea wall as a temporary solution. Anecdotes from residents note that only 15 years prior, the other side of the sea wall (which is now ocean) was home to an elementary school and roughly twenty houses.<sup>17</sup> It has since been consumed by the ocean. Recently, the residents of Shishmaref have voted to relocate the entire settlement to the mainland. Although this will be a permanent solution for the people of Sarichef island they will still lose over a hundred years of history and will need support and financial aid from the U.S. federal government to permanently relocate.

The last example of climate displacement is similar to the aforementioned. The people of the Lohachara island in India's Hooghly river are losing their landmass quickly. Since 1969 more than half of the island has been lost leaving only five square miles of the original land remaining.<sup>18</sup> The same processes have been taking place as both Carteret islands and the Lateu Village in Vanuatu. The main difference seems that India has had less of a capacity of accommodating the people of Lohachara island.<sup>19</sup> They have been mostly left to fend for themselves. All of the above examples: the Carteret Islands in Papua New Guinea, the residents of Lateu village in Vanuatu, the Shishmaref village on Sarichef island in Alaska, and the Lohachara island in India's Hooghly river. These all prove the need for more

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<sup>17</sup> Martin, A. (n.d.). An Alaskan village is falling into the sea. Washington is looking the other way. Retrieved November 10, 2020, from <https://www.pri.org/stories/2018-10-22/alaskan-village-falling-sea-washington-looking-other-way>

<sup>18</sup> Pal, S. (n.d.). Photos: This is life on a sinking island. Retrieved November 10, 2020, from <https://qz.com/449909/photos-this-is-life-on-a-sinking-island/>

<sup>19</sup> Ibid.

sustainable, concrete and lasting solutions for future migration induced by changing climates.

As tragic as the aforementioned examples of displacement are, you may be asking yourself a ‘so what’ type of question. Yes, it is important to concede that the numbers of climate change induced displacement thus far are small. In fact, there are other refugee crises across the globe that dwarf the numbers from the above examples.<sup>20</sup> That said, these examples are only preliminary. The point of the previously mentioned examples is not to depict a current refugee crisis. The aim is to show a forecast of what the future holds and we are now witnessing the very beginning of it. Related back to the beginning of this paper there was mention of the current population and estimated future population of coastal regions.<sup>21</sup> Although some of these regions, mainly metropolitan areas who have access to money, will have adaptive capacity most will not.<sup>22</sup> Based on current trends, by the year 2100 there will be an estimated one billion individuals who live in coastal regions that are prone to sea level rise.<sup>23</sup> As touching as the examples presented in this paper are they are not meant to garner sympathy for only those cultures presented in this paper. It is meant to be a foreboding picture of what is yet to come. Soon future instances of displacement will not garner the amount of attention the Carteret

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<sup>20</sup> United Nations: Refugees. (n.d.). Refugees. Retrieved November 27, 2020, from <https://www.un.org/en/sections/issues-depth/refugees/>

<sup>21</sup> Factsheet: People and Oceans [Pamphlet]. (2017). New York, NY: The Ocean Conference: United Nations, New York.

<sup>22</sup> Carter, J. G., Cavan, G., Connelly, A., Guy, S., Handley, J., & Kazmierczak, A. (2015). Climate change and the city: Building capacity for urban adaptation. *Progress in Planning*, 95, 1-66. doi:10.1016/j.progress.2013.08.001

<sup>23</sup> Factsheet: People and Oceans [Pamphlet]. (2017). New York, NY: The Ocean Conference: United Nations, New York.

Islands have had. There will simply be too many for the media to account for. The foreshadowing from these examples is meant to justify the ensuing solutions for future migrations caused by climate change induced displacements.

The latter part of this essay will be focused on potential solutions for this global issue. The importance of outlining the scale of the issue was important to justify the following solutions. Further, presenting anecdotal evidence grants a level of humanity to this issue. That said, it would be a loss to only present this as a serious problem and not outline potential solutions. I have found the lack of solutions disheartening when studying climate change. There is no single policy that will encompass and accommodate all future climate migrants. The issue is multifaceted and will require a comprehensive effort to adequately handle future migrations. There are a number of policies that the United Nations (UN) and developed countries can adopt to help prevent, mitigate and handle future migrations due to climate change. As such, the approach advocated for in this paper will be three-pronged. First, add environmental displacement into the UNHCR definition of a refugee. Second, prevent and mitigate future displacements, now, by investing into infrastructure and renewable technologies. Last, implement a cap-and-trade system to equitably distribute the load on developed nations for taking in refugees once they are displaced.

The first part of the solution to addressing climate refugees is simple, but vitally important. The current UNHCR definition of what constitutes a refugee is as stated:

“A refugee is someone who has been forced to flee his or her country because of persecution, war or violence. A refugee has a well-founded fear of persecution for reasons of race, religion, nationality, political opinion or membership in a particular social group. Most likely, they cannot return home or are afraid to do so. War and ethnic, tribal and religious violence are leading causes of refugees fleeing their countries”.<sup>24</sup>

Further the United Nations Refugee Agency in the Convention and Protocol defines refugee status as:

“Someone who is unable or unwilling to return to their country of origin owing to a well-founded fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group, or political opinion, is outside the country of his nationality and is unable or, owing to such fear, is unwilling to avail himself of the protection of that country; or who, not having a nationality and being outside the country of his former habitual residence as a result to such events, is unable or, owing to such fear, is unwilling to return to it”.<sup>25</sup>

Considering both of these very similar definitions will give you an encompassing view of how the United Nations (UN) and its respective member-countries view

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<sup>24</sup> What is a Refugee? Definition and Meaning: USA for UNHCR. (n.d.). Retrieved November 12, 2020, from <https://www.unrefugees.org/refugee-facts/what-is-a-refugee/>

<sup>25</sup> Ibid.

individuals seeking refugee status. Historically, this definition has done a sufficient job for accounting for displaced people. For example, 68% of those displaced across borders come from only five countries: Syria, Venezuela, Afghanistan, South Sudan and Myanmar.<sup>26</sup> The aforementioned countries are discriminatory and war-torn, and the existing definition of a refugee has accounted for individuals who were forced to leave. Although the current definition has worked for a majority of historic refugees it has not changed with the times.

The need for an updated UNHCR definition of a refugee is becoming increasingly clear. Reading the above definitions of what is considered as legitimate refugee status you may have noticed there is zero mention of any sort of environmental displacement. The cases mentioned previously (Carteret islands, Sarichef island, etc.) fall outside of the UNHCR definition of what constitutes a refugee. Because of this it has been difficult to enact official plans for dealing with climate change induced displacements because it has not been incorporated into the UN's actual view of a refugee. The first and arguably most important step to address the large numbers of future climate migrants is adding environmental displacement into the UNHCR refugee definition.

The second aspect to address this issue is also relatively straightforward. The best way to address future climate migration is to make intelligent decisions, now, regarding mitigation and prevention. The climate science is accurate and we have the information necessary to direct appropriate decisions to a more sustainable

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<sup>26</sup> What is a Refugee? Definition and Meaning: USA for UNHCR. (n.d.). Retrieved November 12, 2020, from <https://www.unrefugees.org/refugee-facts/what-is-a-refugee/>

planet. Further, the technology for transportation and energy production is nearly up to par with feasibility of fossil fuel. The one thing that seems to be lacking is the political viability and/or political will to take action. There are a number of institutional and cultural barriers in place that are leaving decision-makers stagnant.<sup>27</sup> That said, there are many salient reasons why proactive action should be taken.

One of the most fundamental solutions to dealing with environmental refugees is acting proactively not reactively. Preventing future migration by mitigating is a straightforward step in reducing the total number of migrations before they are necessary. Thus, this will lessen the burden on countries who will be responsible for accepting the migrants. This strategy will serve as a double benefit to both the potential migrant and receiving country. Not only will people be able to keep their homes, but host countries will not have to deal with the contentious issue of migration. Investing in sustainable innovations right now will save money spent on damage relief decades down the road. This is simply short termism vs long termism. Again, when framed in the lens of sustainable investment opposed to damage relief the choice seems clear. We are currently functioning within an economic system centered around infinite growth. The simple fact is that we live on a finite planet and our current reliance on the extraction of fossil fuels is unsustainable. The benefits of proactive measures taken over the next few years

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<sup>27</sup> Norgaard, K. (2011). Climate denial: Emotion, psychology, culture, and political economy. Oxford handbook on climate change and society, 18, 399-413.

outweigh upfront costs and will prevent the full extent of future migration caused by environmental displacement. Although sustainable investment is important it will only take us so far. Given current projections we are already guaranteed certain levels of SLR. Beyond SLR there are other numerous factors that will displace people that were not mentioned in this paper. These include but are not limited to: forest fires and decrease in agricultural productivity. It has been previously demonstrated that displacements are already occurring which calls for a system in place to accommodate these refugees.

The final aspect to addressing environmentally displaced people is the creation of an equitable system to distribute the responsibility between countries for accepting climate refugees. At this point, mitigation and adaptation will not be enough to protect all people. Populations are already being displaced and this trend will continue into the future. Migration is inevitable. As such, it is important to have an international policy-based solution that is equitable, sustainable, and politically viable. The solution is similar to an emissions cap-and-trade system, but instead of trading emission quotas you are trading refugee acceptance quotas. This idea is not entirely novel, it has been speculated as a solution non-specific to climate migrants by others. Also, advocates for this policy fail to recognize the political viability to such a system since due to its market-based nature.

First, quotas will be distributed between all countries based on their capacity to accept migrants. Organization for Economic Co-operation and Development (OECD) countries will be responsible for the largest number of accepted migrants. It

is difficult to perfectly measure a receiving country's ability to accept migrants but calculations including total GDP, per capita GDP, geographic size, geographic proximity and overall population will hopefully generalize a country's capability of acceptance. Once quotas are established between nations, trading and changes in allotment can be negotiated. For example, if there is a ethnically homogeneous country that has no interest in accepting refugees they can pay-off other participants to take their burden. The payment can come in many forms whether it be credit/cash or infrastructure development. The idea is that countries who are willing to accept refugees but face financial barriers are incentivized to accommodate more migrants because they will receive payment from nations who do not meet their acceptance quota. The aim of a system such as this is not to be too idealistic. Although it is difficult to accept, policy solutions need to have political viability. As effective as the most progressive solutions are, many are not realistic because they have to be enacted. Hopefully, this type of system is more politically viable and equitable than others. It is equitable because a single country is not taking on the entirety of the financial and cultural stress of accepting refugees. It is politically viable because it creates a market for refugee quotas which has been a cornerstone of the right's perspective in recent decades. As such, this system aims to appease the aforementioned concerns voiced by skeptics of other solutions.

The issue of climate change induced migration will only multiply in scale in coming decades. As such, the need for incremental changes starting now is necessary. Prolonging moderate action on this issue now will call for a more

progressive movement in the future. This line of argument will hopefully succeed in moving policy-makers in the right direction soon. If not, they will be faced with heavy criticism in the years to come. Climate change induced migration will soon become the leading cause of global migrations rather than displacements caused by war, gender discrimination and religious discrimination.<sup>28</sup> As mentioned previously investments in renewable technology and infrastructure to accommodate displaced people will be efficacious compared to money spent on damage relief. Although the solutions outlined in this paper will not solve all future displacements, they will aid in mitigation, inclusion in the refugee definition, and hopefully setting up an equitable system once displacements occur.

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<sup>28</sup> Dobson, J. (2019, November 25). Shocking New Maps Show How Sea Level Rise Will Destroy Coastal Cities By 2050. Retrieved October 4, 2020, from <https://www.forbes.com/sites/jimdobson/2019/10/30/shocking-new-maps-show-how-sea-level-rise-will-destroy-coastal-cities-by-2050/>

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