STOLEN LAND. DISAPPEARING ISLANDS AND THE MALDIVIAN PARADOX

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The impact of human activities on Earth has spread across the planet's environment, to the point that researchers are theorizing the emergence of a Technosphere[1]. In the Anthropocene, environmental protection has become urgent; however, ecological sciences are required to consider human activities and natural processes as integrated. The question arises as to how to reconcile the inherent creative nature of humans with the preservation of life on Earth. In the Maldivian archipelago, the "technology versus nature" paradox is so extreme as to generate a hyperconcentrated inquiry microfield, like a terrarium in a glass bell jar. Humans named "Earth" the planet, establishing a primacy of land over water. However, Earth could instead be called *Water* or *Oceanus*, oceans being at the center of water and nutrient cycles and atmospheric and thermal regulation (Roff et al. 2011). The preservation of marine ecosystems plays in fact a key role in the survival of the human species. Coral reefs, in particular, are one of the most productive and diverse coastal marine ecosystems, supporting about 500 million people worldwide, providing crucial ecosystem services (food, tourism, protection from coastal erosion, etc.), valued at about $10 trillion (Knowlton et al. 2021). However, they are highly exposed to co-occurring local anthropogenic pressures, such as coastal works, pollution, and overfishing (Halpern et al. 2007), due to their proximity to anthropized areas. Maldivian atolls are especially endangered by the consequences of the decline of coral reefs. For thousands of years, their islands have continuously changed in shape, depending on monsoon cycles and climate fluctuations, while coral reefs represent one of the main defenses against coastal erosion (Kench et al. 2023). In recent decades, sea levels have risen steadily, threatening to permanently submerge low-lying islands (Lindsey 2021). With their maximum elevation of 2.4 m above sea level (Stevens and Froman 2019), the consequences for the Maldives will be so devastating that, by 2050, they will become uninhabitable, unless drastic measures are implemented (Storlazzi et al. 2018).

The disappearance of an island is not new to the Maldives. While they are officially divided into "inhabited" and "uninhabited" islands,[2] a third unofficial category exists: the "disappeared islands" (McConnell 2022). These are the ones that have been completely eroded by the sea and only survive in local history. Nowadays, the government uses two tools to counter the loss of habitable land: people resettlement, and land reclamation. Resettlements are part of the history of the Maldives, since the past, the government has moved populations from one island to another for climatic reasons, with various social repercussions.

In 1968 the Giraavaru people were forced off their ancestral island and relocated to Hulhulé, except to be moved again to make way for the airport (Gnanadesikan 2016). Land reclamation, or the act of snatching a few acres of land from the sea, albeit an immediate solution, presents inconsistencies as well.

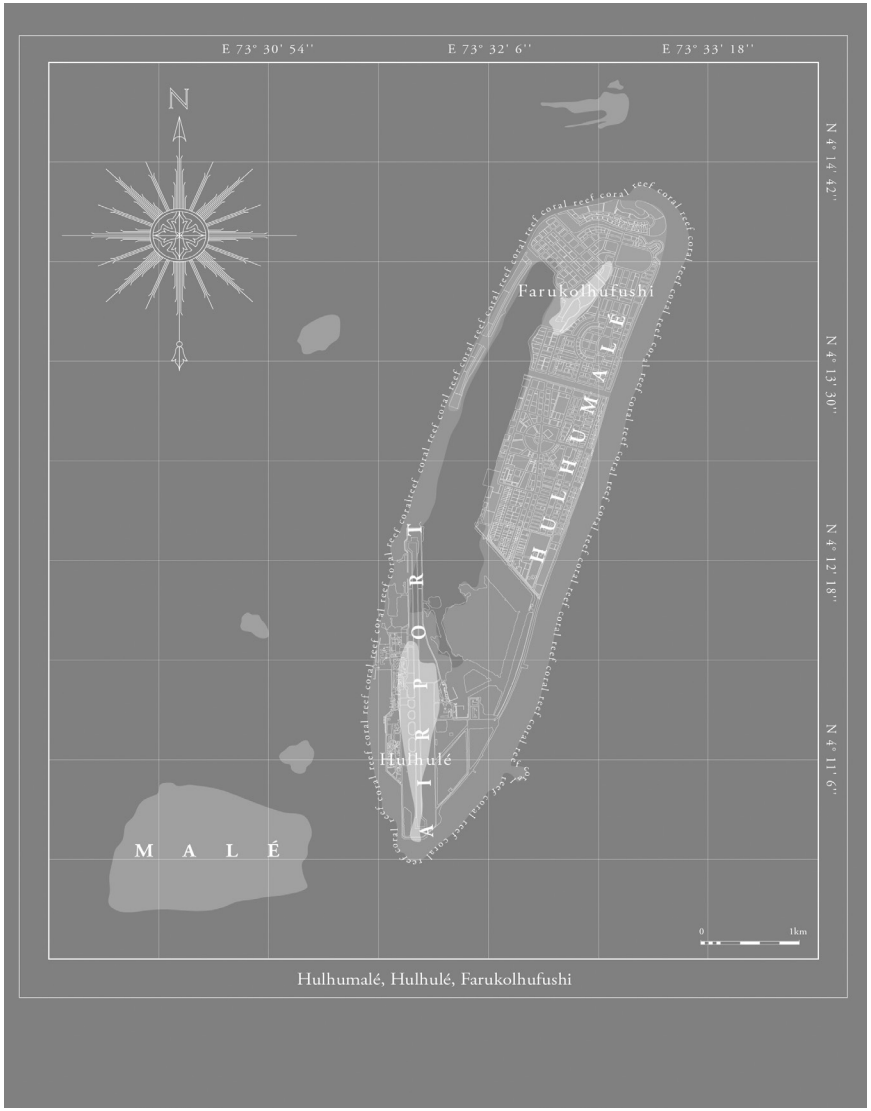
Our case study includes the natural islands of Hulhulé and Farukolhufushi, and the reclaimed island of Hulhumalé (Fig 01). Hulhulé is where Velana Airport, the most important of the nation, is located. Its birth dates back to 1960, when, during the British protectorate, a Royal Air Force plane landed on a slotted steel runway, built directly on sand⇊. In an act of military colonization, infrastructural colonization of the sea began. The future of Hulhulé and Farukolhufushi was written: tiny islands, destined to become engulfed in the most ambitious reclamation project in the Maldives to date. In the late 1990s, when space in the capital Malé began to run out, the government started a project to acquire new land. Thus, Hulhumalé was born,⇑ a city intended to accommodate 240,000 people⇂. The official motivations for the project were linked to climatic conditions, although some researchers argue that politico-economic reasons prevailed (Gussmann and Hinkel 2020; Kothari 2014).

In the 21st Century, a positivistic attitude of blind trust in technological evolution, as an intrinsic source of economic growth has become prevalent worldwide. Human alienation from the environment (Vogel 2011) has corroborated a capitalist value system, in which the monetary calculation of the wealth of a community supersedes its members' well-being. Land reclamation policies in the Maldives seem to follow this trend. According to the developer's website of Hulhumalé, their goal is "investing for the long-term future, nurturing the youthful talent and most of all forming new traditions" and that "the City welcomes people from all the Islands of Maldives." It seems like a (commercial) attempt to create a cultural and historical identity, which can also be detected in the name of the resort built on old Farukolhufushi: "Heritage Island."⇇ It is ironic, that precisely one of the causes of disequilibrium in the system, tourism, comes to represent (even if only in name) the last remnant of the primordial *genius loci*.

The paradox between economic interests and ecosystemic health seems to be irreconcilable in the Maldivian atolls, tiny terrariums drowning in ever-warmer waters. Due to the destruction of coral reefs, land reclamation is both a solution and a concurrent cause of the environmental imbalance.

An alternative to land reclamation are floating cities (Moosa et al. 2020), infrastructure and architecture specifically designed

Fig 01 *Hulhulé* lagoon after the Hulhumalé reclamation.
Drawing by Beatrice Azzola, 2023.



for rising sea levels. Although the impact of floating structures on aquatic ecosystems is unclear, as research is still scarce, it seems that they have both positive and negative effects on aquatic ecosystems and that the system has potential for implementation (Pedroso de Lima 2022). "Maldives Floating City" is a project co-financed by the Maldivan government and a Dutch developer, which will cover 8 million square meters of water with floating architecture. The narrative is that of a real estate operation rather than a solution to various environmental and social issues. A slogan on the developer's website eloquently states, "Where there is nothing, anything is possible"[*]. Coral reefs, however, are very much present in the project site and must be recognized for their vital role in the country's well-being.

In the Maldives, few coral restoration and rehabilitation projects are being put forward. Still, many more will be needed to fully sustain these fragile ecosystems (Fig 02). During land reclamation two main mitigation measures should be put into place: before the beginning of the project corals should be moved from the area of intervention to a safe site; and secondly, once the project is finished, 40-50% of the coral reef that was destroyed should be restored by creating a new artificial coral ground[‖]. Once again, relocations will occur, this time not of humans but coral populations. A reversal of roles, in which nature and human beings must share slender spaces and ever-scarcer resources. In this framework, a broader integration of landscape and architecture with ecological practices will contribute to a more harmonious coexistence of built environment and natural ecosystems.

If the road ahead seems clearer from an ecological perspective, the answers to architectural and housing issues appear more complex. Further research in floating architecture and innovative building technologies is crucial to better understand how to rebalance the disproportion caused by uncontrolled construction and the abuse of the land reclamation tool. However, the question of how to solve the Maldivian reclamation paradox remains open. Common ground must be found, for human, animal, and plant communities to thrive on the islands, so that no land will come to be stolen.

Fig 02 *Reef profile*: a) healthy reef before reclamation; b) impacted reef after reclamation; c) integration of reclaimed land with restored ecosystems. Drawing by Beatrice Azzola, 2023.

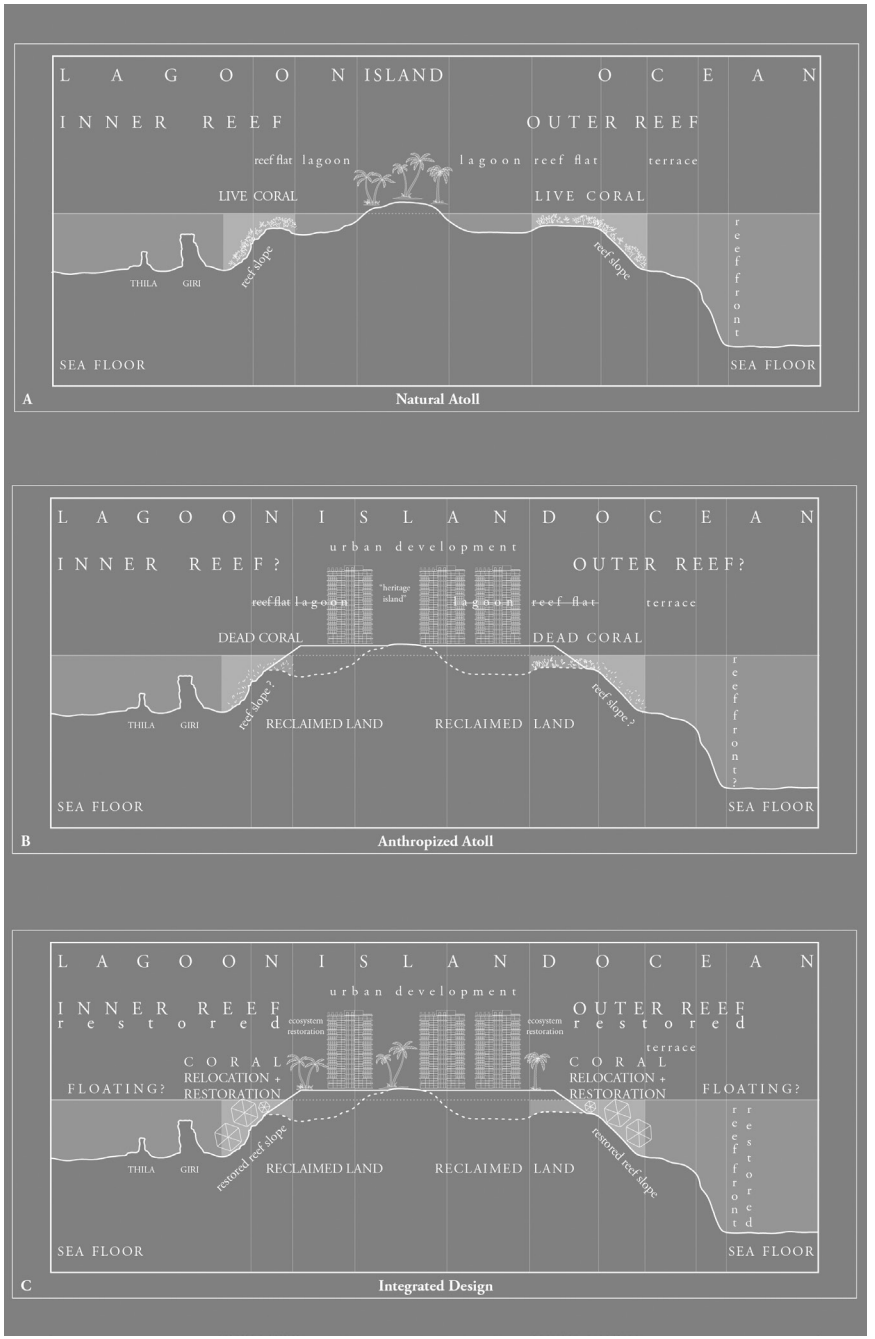


Fig 03 *Resort "Heritage Island" on Farukolhufushi.*
Photo by Irene Pancrazi, 2023.

The term was introduced by John H. Milsum in his 1968 text *The technosphere, the biosphere, the sociosphere. Their systems modeling and optimization* to indicate all technological objects (machines, cars, infrastructure, computers, etc.).

The database of Maldivian atolls can be accessed on the Ministry of Fishery and Agriculture website: https://www.atollsofmaldives.gov.mv/ [accessed 15 December 2023].

Historical photos and dates can be found on the MACL (https://macl.aero/corporate/about/history) and government (https://archives.gov.mv/en) websites [accessed January 15, 2024].

Crasis of Malé and Hulhulé.

Data taken from the Urbanco website (https://www.urbanco.mv/hulhumale/) [accessed 15 December 2023].

Ibid.

Details of the project can be found on the website of *Dutch Docklands - Christie's International Real Estate.* https://www.dutchdocklands.com/ [accessed 15 December 2023].

Information on coral restoration can be found on the *Save the Beach Maldives* website https://www.savethebeachmaldives.org/ [accessed 15 December 2023].