

# Conceptual Design of a Floating Island City

by Carl T.F. Ross and Ricardo Rodriguez McCullough

A conceptual design of a floating island city was produced from the imagination and endeavours of Dr. Carl Ross and his student Ricardo Rodriguez McCullough of the University of Portsmouth, U.K. Ross and Rodriguez McCullough believe that by the year 2050, floating islands will be used as a means of housing the rapidly growing population of the world, while other floating islands will be used for growing food. Apart from providing extra space, the floating islands can produce enough renewable energy to supply their own needs and to sell the surplus energy to the mainland, and thus, not require environmentally unfriendly methods of producing energy. As the floating island is surrounded by water, the renewable energy can be produced mostly through wave and tidal energy, together with solar and wind energy. Human waste can also be converted to provide bio-mass energy. Ross and Rodriguez McCullough believe that as some 71% of the Earth's surface is covered in water, it will be necessary for humankind to colonize the seas. Moreover, they believe that if these floating islands are not built, humankind is likely to suffer a disaster of biblical proportions; but if the scientist and the technologist "are given the tools, they can finish the job."

In 1925, according to David Attenborough on BBC's *The One Show*, the world's population was about two billion. According to the United Nations, in the year 2009 it grew to a staggering 6.8 billion, virtually quadrupling in about a century. Moreover, the United Nations estimates that by the year 2050, the world's population will grow to about 10.5 billion. Additionally, if the world's population quadruples during the next century, we will have a world population of about 28 billion. How are we going to house and feed such a large world population? The problem is worsened by the detrimental effects of global warming, causing even more loss of land. Scientists estimate that the Arctic floating ice-pack will melt in five to 15 years from now. Now if the floating ice-pack melts, it will not cause a rise in sea levels, neglecting thermal expansion of the water because, according to Archimedes's Principle, a floating ice-pack displaces its own mass of water. However, if the floating ice-pack melts, it will cause a darkening of the Arctic Ocean, so that the value of the Arctic Ocean's albedo (the fraction of solar energy reflected from the Earth back into space) will be decreased by approximately 70%. This will cause the seas to warm up even faster, through positive feedback, and cause the Ice Mountains on Greenland to melt.

Now it must be realized that Greenland is the second largest island in the world; its surface area is nearly nine times that of the United Kingdom, and if the Ice Mountains on Greenland melt, there will be a rise in sea levels of about 6.7 m (22 ft.), possibly by the turn of the present century. This will worsen the problem of housing and feeding the world's population, especially for countries such as Holland and Bangladesh, which will both suffer serious land loss. Also, many of the "paradise" islands in the Indian and Pacific Oceans will disappear under water.



One way to house and feed a burgeoning world population, worsened by the concomitant loss of dry land due to climate change, will be to build floating island cities all over the world. Thus, humankind will have to colonize the seas to avoid a catastrophic disaster of biblical proportions. It must be remembered that water covers some 71% of the Earth's surface, or nearly three times the Earth's dry land area, so it is common sense to colonize the oceans. In the present study, a conceptual design of a floating island city is presented. The city is designed to accommodate a population of about 150,000 and has additional facilities such as a university/college, schools, a hospital, leisure facilities, services, industrial complexes, shops, airport, etc. at a cost of around £25 billion. A plan of the city is shown in Figure 1. The city itself will be above sea level, supported by several adjustable concrete tubular pillars. The platform "resting" on the top of the tubular concrete pillars will be made of glass fibre ('S' glass), whose fibre strands are some 50 times stronger than concrete in compression. Other floating islands could be used to promote hydroponics agriculture, which will require air, water, sunshine, and nutrients, but will not require soil. Recent studies have shown that the hydroponics method of agriculture is much more efficient than conventional agriculture and is less prone to root diseases.



Figure 1: The Floating Island City concept.

With so much electrical energy available, it is suggested that all vehicles are electrically powered. Whereas, at present, electrically powered vehicles cannot compete with vehicles powered by petrol (gas) and diesel fuel, the authors believe that within a few decades, the electrically powered vehicles will "come into their own right."



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