



FUTURE FLOATING CITIES

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Abstract: Today Floating structures can create a solution to the expansion of urban areas by exploiting the sea surface while leaving the suburban green intact. The floating cities can be constructed of lightweight new technology materials, mounted on a platform and utilizing Renewable Sources of Energy. To the architects, these cities are expected to be smart, livable, sustainable and resilient. The establishment of secure bases put forward to counter the risks arising from natural disasters .e.g. : flooding ,earthquakes ,tsunamis.

Keywords– Introduction, Floating structures, Suburban, Renewable sources of energy, disasters.

I. INTRODUCTION

The necessity to protect the natural environment becomes more important in the present and even more in future if there is to be any hope for our planet. As our cities struggle with overcrowding and undesirable living situations, the ocean remains a potential boundary for sophisticated water-based communities. Due to their buoyant design, floating cities would provide safe, climate-resilient housing for flood-stricken communities. Additionally, the positioning of the platforms in a floating city could cast shadows on the surface of the water, helping to lower oceans temperatures that have risen as a result of climate change.

II. HISTORICAL BACKGROUND

Nearly a decade ago, billionaire Peter their cofounded a nonprofit called Sea Steading Institute and contributed seed funding toward what could be the world's first floating city. Oceanix City is the first sustainable floating city, it would essentially be groups of hexagonal platforms-anchored to the seabed, that could each house around 300 people, effectively creating a community for 10,000 residents. In the face of the reality of climate change, Maldives is getting the world's first truly floating island city. Approximately called, Maldives Floating city (MFC), according to the press release.

III. FLOATING CITY DEFINITION AND TYPES FLOATING CITY:

Ocean colonization, the theory and practice of building structures to allow humans to live permanently in areas of earth covered in water. Types of floating structures: Types of floating structures: supported structures, totally floating structures are divided into 2 teams. A) Semi floating structure: Semi floating structures are unbroken at the highest of water surface by victimization pipe-form columns. This sort of structures is employed for conditions of ocean with radio emission. B) Full floating structure: These types of structure stay as an oversized plate on water surface. Full floating structures are principally appropriate for pacific waters like lakes, gulfs, coastal lines.

3.1 Various characteristics of cities:

A sustainable city or eco-city is city designed with consideration of environmental impact, inhabited by people dedicated to minimization of required inputs of energy, water and food, waste output of heat, air pollution- CO2 methane, and water pollution. A sustainable city can feed itself with minimal resilience on the surrounding countryside, and power itself with renewable source of energy. The Crux of this is to create the smallest possible ecological footprint, and to produce the lowest quantity of pollution possible, to efficiently use land: compost used materials, recycle it or convert waste-to-energy, and thus the city's overall contribution to climate change will be minimal, if such practices are adhered. (Register, 1987). An Eco-city is city or a part of that balances social, economic and environmental factors to achieve sustainable development. It is city designed with consideration of environmental impact, inhabited by people dedicated to minimization of required inputs of energy, water and food, and waste output of heat, air pollution-CO2 methane and water pollution.

Intelligent cities are defined as virtual reconstruction of cities, as virtual cities. The term has been used broadly as an equivalent of 'digital city', 'information city', 'wired city'. 'telecity' (Malaysian Institute of Microelectronic system). Intelligent cities (or intelligent spaces more generally) refer to physical environments in which information and communication technologies and sensors system disappears as they become embedded into physical objects and surroundings in which we live, travel and work.

Completeness, Segregation activities should be reduced. Community development should be more balanced by including jobs, housing, shopping and other land uses. Conservation, Urban growth should be restricted in and around sensitive

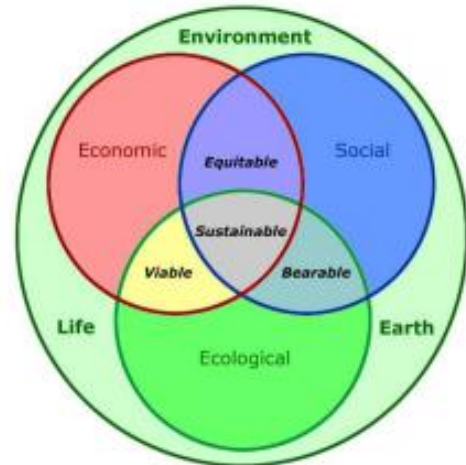
environmental areas and habitats to preserve their ecological functions. Compactness, Compact city which is less auto dependent, less expensive to serve infrastructure and less pressure on environmental sensitive areas.

The future of cities would provide a total environmental which clean air and water, health care, good nutrition, entertainment access to information, and education for all.

Renewable sources of energy, has smallest possible ecological footprint, lowest quantity of pollution possible (Novtny, Ahern & Brown 2010). Completeness, Conservation, Compactness, Coordination, Collaboration, Comfort, Clean air and Water Health care (Fresco, 2007). Emission are reduced, climate change mitigation and adaptation, sprawl is minimized, Non-renewable resources are sensibly used, the waste produced is recycled, ecological footprint of cities and town is reduced. Partly adopted from UN- Habitat and DFID (2002).

What will change over the next few decades is the availability of resources and what we do with the waster outputs (Goode, 2011). Cities of the future have to be organic, flexible and versatile. A city has to adopt to change. Futures for the cities have to be more sustainable: ideally they will produce more energy than they need, become net carbon absorbers, collect and process waste within city limits and collect and clean recycled water.

We can bring all these characteristics under one name that is sustainable cities. A sustainable city or eco-city is city designed with consideration of environmental impact, inhabited by people dedicated to minimization of required inputs of energy, water and food, waste output of heat, air pollution- CO2 methane, and water pollution.



IV. FUTURISTIC FLOATING CITIES AND THEIR PRINCIPLES:

The trendy idea of a property, climate-resistant floating town has origins within the sea steading movement, a vision headed by the sea steading institute that seeks to form autonomous nation-states on water. Sea stealers' hope is to form a human-made scheme of communities that are designed to grow, adapt, and rework over time. A number of the principles that anchor floating town are:

1. Modular construction: Town would be prefabbing offshore and towed to the ocean to scale back prices.
2. Net zero energy: town would be designed to harness star and wave power to self-generate the maximum amount energy because it consumes.
3. Zero waste: All waste would be changed into energy, recycled materials, or feedstock.
4. Habitat regeneration: town would use marine building materials that grow, heal, and strengthen over time.
5. Locally sourced materials: Builders would rate materials with a negative carbon footprint.
6. Sharing culture: town would embrace communal farming and sharing of used materials.
7. Shared mobility: Transportation modes would be integrated to scale back transportation demand.
8. Freshwater autonomy: Water would be perpetually harvested and recycled while not water.

4.1 Design for future floating cities:

Town ought to accommodate a group of connected platforms with variable styles, each of which might serve a job in sustaining the floating tube. One platform would house submerged gardens for growing food whereas another would hold chemical action instrumentality for creating salt water drinkable. Inner platforms would house communal facilities for programs like education, culture, exercise, and attention. The same as standard construction seen onto land, the infrastructure of those floating cities would be able to be disassembled and reconfigured by architects for continued development. All buildings within the town would even be made at a coffee height to attenuate harm from climate events.

4.2 protection from natural disaster:

Because they might be designed on the water, floating town structures would maintain a lower center of gravity, protective them from robust waves, floods, tsunamis, and even hurricanes. The utilization of locally-sourced innovative building materials would enable the structures to self-repair over time and stand up to natural harsh atmospheric condition.

4.3 Renewable resources:

Floating cities would use resources from native solar power, recirculating water, and food production to be totally self-directed. The open ocean would supply associate rife, untapped supply of each water and solar power, that can be controlled to be used with new technologies like sophisticated aquifers and purifiers. Floating communities would even be able to generate their own turn out and food from on-land farms and underwater gardens. this might enable these communities to scale back waste and transport by manufacturing the food necessary to feed their inhabitants.

4.4 Low environmental impact:

Floating buildings would play a key role in reducing CO2 emissions within the designed setting. The Oceanix town construct includes restrictions prohibition high carbon-emitting cars or trucks — even garbage trucks. Instead, gas trash tubes would be accustomed transport trash to a sorting facility, wherever they might be recycled or repurposed. The closely knit style of those

floating settlements would create it potential to use driverless vehicles and drones to create deliveries, likewise as a shared route for traveler travel exploitation solely property modes of transportation.

4.5 Housing alternative for crowded cities:

By 2030, it's anticipated that 60 % of the world's population can inhabit cities. As cities become overcrowded and living conditions more and more undesirable, urban planners are investigation new housing solutions like 3D written homes. A new ability to make homes on the ocean's surface may increase offered housing house and facilitate de-populate overcrowded cities. As cities become additional packed, housing also will become more and more troublesome to afford. Floating cities would supply a respite from the housing crunch, notably in cities with native governments that are willing to speculate in offshore housing. Manufacture paired with the low value of leasing house on the ocean would produce an inexpensive model of living.

4.6 Advantages of floating cities:

- Protection from natural disasters.
- Climate change solutions.
- Housing different for packed cities.
- Renewable resources.
- Low Environmental Impact.
- Protecting from robust waves ,floods, tsunamis.
- Floating town maintains lower centre of gravity.
- The structure established simply and quickly.

4.7 Components of mega floating system:

- Mega floating city will be preservation of the marine surroundings (Not heavy ocean bottom materials or the recurrent event power).
- Use of natural weight supporting force (use of buoyancy).
- Creation of additional area for material usage society (easy to expand, cutback or reconfigure; recyclable materials).

4.8 Safety measures for floating cities:

Securing the peoples, properties is that the most vital side and it'll have monumental influence on the planning choices. property injury could occur thanks to major structural failures like inverted, sinking, world structural failure. These disasters square measure in the main a results of environmental hazards like massive waves, storms, etc. thus it's vital for town to be able to move quick enough to avoid the disaster, with a study of the wind and climate.

4.9 Environmental Benefits:

These floating cities would be built from scratch to be climate neutral and self-reliant, which provides a number of key environmental benefits.

1. Protection from Natural Disasters

Because they would be built on the water, floating city structures would maintain a lower center of gravity, protecting them from strong waves, floods, tsunamis, and even hurricanes. The use of locally-sourced innovative building materials would allow the structures to self-repair over time and withstand natural harsh weather conditions.

2. Climate Change Solution

Climate change threatens the future of many communities. Ninety percent of the world's largest cities are situated near a body of water. To make matters worse, sea levels are expected to rise by at least 26 inches by the end of the century. Due to their buoyant design, floating cities would provide safe, climate-resilient housing for flood-stricken communities.

Additionally, the positioning of the platforms in a floating city could cast shadows on the surface of the water, helping to lower ocean temperatures that have risen as a result of climate change.

3. Housing Alternative for Crowded Cities

By 2030, it's anticipated that 60 percent of the world's population will inhabit cities. As cities become overcrowded and living conditions increasingly undesirable, urban planners are investigating new housing solutions like 3D printed homes. A newfound ability to build homes on the ocean's surface could increase available housing space and help de-populate overcrowded cities.

As cities become more crowded, housing will also become increasingly difficult to afford. Floating cities would provide a respite from the housing crunch, particularly in cities with local governments that are willing to invest in offshore housing. Prefabrication paired with the low cost of leasing space on the ocean would create an affordable model of living.

4. Renewable Sources

Floating cities would use resources from local solar energy, recirculating water, and food production to be fully self-reliant. The open ocean would provide an abundant, untapped source of both water and solar energy, which could be harnessed for use with new technologies like high-tech aquifers and purifiers.

Floating communities would also be able to generate their own produce and food from on-land farms and underwater gardens.

5. Low Environmental Impact

Finally, floating buildings would play a key role in reducing CO2 emissions in the built environment. The city includes restrictions banning high carbon-emitting cars or trucks — even garbage trucks. Instead, pneumatic trash tubes would be used to transport trash to a sorting facility, where they would be recycled or repurposed. The close-knit design of these floating settlements would make it possible to use driverless vehicles and drones to make deliveries, as well as a shared route for passenger travel using only sustainable modes of transportation.

V.CONCLUSION:

As mentioned before, floating constructions have a protracted history within the human kind and even if the open water could be dangerous surroundings, we have a tendency to don't need to be petrified of living thereon. After all, hr. of the physique is water and other people have forever had associate degree attraction towards this part. The floating town could be a project that several say is not possible. Advance in material science, natural style construction couldn't solely create the floating town potential however it should even be a necessary side within the future. It is laborious to mention building on water can become a major trend, but it's been tested that it's potential and it's commencing to become widespread.

REFERENCES

- [1] Alf 1.Bolonkin A (2011) Floating cities could redefine human existence. Engineering Earth pp: 967-983.
- [2] White J (2012) Floating cities could redefine human existence. New Scientist 215: 26-27.
- [3] Carl RTF, McCullough RR (2010) Conceptual Design of a Floating Island City. The Journal of Ocean Technology Spin drift.
- [4] Bolonkin A (2010) Floating cities on ice platform. The Open Ocean Engineering Journal 3: 1-11.

