

# Future Possibility of Artificial Islands

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**Abstract—** Due to increase in population & rise in the sea level, it is expected that there will be an area shortage in the near future. Many countries are had solved their problems either by land reclamation or by creating new islands. With Changing scenarios & demands of people have shaped the today's requirement by creating artificial islands. As seen in the historical times, early artificial islands had factors of security & culture (such as the Tenochtitlan, Mexico & Nan Madol) Later, during the time of sea traders in which the construction of harbors was seen to provide an isolated site for the sea route. (such as Dejima). During 17th Century AD, islands were built for defense purpose in Portugal & Spain. In the present time, due to the shortage of area for development & to cater the growing needs of the people, for habitable as well as recreational activities, have increased the pace of developing new islands' viz. Land Reclamation. More recently, the islands have been built to reduce congestion, promote tourism & accommodate airports. Also, there are proposals for building new islands to reduce the danger of coastal erosion or for power generation from the renewable energy sources. Such projects may bring new opportunities & activities to an area which had lesser scope of future development. The effects on environment by such projects may give rise to many other problems, so, it is necessary to examine is aspects. This paper is about how the objectives of forming of new islands or land reclamation had changed from past to the present time. Their pros & cons & also, how it will be in the future, when there will be new issues & objectives for creating new islands.

**Keywords—**Artificial Island & Structures (A.S.I); Land Reclamation; Artificial Islands

## I. INTRODUCTION

Today we live in the world where population (annual growth 1.1%) & global warming are two major issues causing other issues like shortage of land & rising sea level (at the rate of 3.2 mm per year) due to which the density is increasing leaving less space for further expansion & developments. Such a change effects low lying areas such as islands & river deltas, worldwide, on serious scale despite looking small. The rise in the level of seas & oceans will lead to several other issues like economic instability, natural disasters & further population displacement. Higher amount of resources for civil protection, unavoidable loss of land & its resources to the sea & possibility of conflicts between other states & territories are other major problems. In the present time preservation & land reclamation has been seen as the solution for the loss of coastal zones. Despite of its high costs (Japan's cost of preservation in the Okinotrishima is evaluated to be 29.3 billion Yen so far & the expected cost of major preservation projects like in Maldives is expected to be far beyond their capacity) & their strength, as well as their short term status, these methods seems to be the way to provide solution for land shortening or the loss of land. These

changes led to the demand of advancement & adjustments which might provide new opportunities for the development. To cater the problem of gradual sinking of lands, especially in case of small islands & low-lying states. Various techniques & application of Artificial Island & Structures (A.S.I.), are proposed or are being practiced. Adversely, safety & environmental concerns have been much more thoroughly elaborated on regional & national level, but only for investigation & utilization platforms. The formatter will need to create these components, demanding the applicable criteria that follow.

## II. FORMER TIMES

In former times when there were no problems like rising of a sea level or a population in the cities, the formation of artificial islands had been in a practice. There are many examples from several parts of the world. The purpose of constructing these islands varies from one a place to another. Such as, during the Aztec times, an island named Tenochtitlan was built in the present Mexico, an artificial island was established on a pile of dirt & was held in a place by the stakes. 2,50,000 people lived in the city of Tenochtitlan, the predecessor of Mexico City, was surrounded by many small islands was built on a small natural island in Lake Texcoco. The main aim of constructing these islands were security & religious purpose of the Aztecs as guided by their priest for location. Another example of the artificial island is Uros island, Peru are supported by layers of floating wimp anchored with ropes & sticks which are driven to the lake's bottom. The Uros Indians still live there. The life of a floating island ranges between 5-18 years. Artificial islands are being used since the 17th century AD for coastal defense (like in Spain & Portugal), trade & also for increasing the land area. Japan had also built islands for making new harbours, so s to increase the trade capacity of the nation.

## III. PRESENT TIME

Today, the islands are created to tackle the issues like population, land shortage or rise in the sea level. Earlier, land reclamation was the solution to these problems. For example - Netherlands has the largest number of reclaimed lands. The shortage of lands had led the government to take new measures for finding out lands for various purposes like farming, living, etc. Reclamation of Flevopolder was completed in 1969 with the total land area of 970 sqkm. & is the largest artificial island in the world. In south & south-east Asian seas, the artificial islands are popular for land preservation & reclamation. There, the small size of islands makes spatial necessities that are hard to fulfil in an unexpected way. Recovery ventures of artificial island in

light of smaller islands is the standard case particularly for the development of like the construction of airports or harbors. Examples of such practices are in Singapore, Maldives & Hong Kong. In Singapore, in light of various smaller islands of area under 10 sqkm., Jurong island (recovered from land territory of 32 sqkm) was framed to home real petrochemical establishments & an electric power plant. At long last in the Maldives, by the capital of male, the nearby government made on the Kaafu Atoll manufactured the island of Hulhurmale to overcome the future needs concerning lodging, modern & business advancements. The island also has the male air terminal & as the opposed characteristic island of male (remaining at most extreme height of 1 m above ocean level) remains at 2 m above the water level to face a possible ocean level ascent. The Hong Kong International Airport lies on parallel islands made by the merger of two islands. (making up 25% of the surface territory of the airplane terminal's stage.)

Sea colonization is a practice of lasting human settlements in the seas. Such settlements might be sea steads skimming on the water surface or exist as submerged living spaces secured to the sea bed or in the middle of the road position. Other conceivable advantages incorporate extends access to undersea assets, novel types of administration & recreational exercises.

In the most recent times, the utilization of artificial islands is for human settlements & living spaces. Looking back in 50s, when Seaward artificial islands were utilized as radio stations which were initially showed up in the North Sea & were further created in 70s with the existence of celebrated private possessed states, for example Sealand, Minerva or Atlantis, the residence of the seas on fake islands now begins to discover worthy & in this way down to earth applications.

Later, new islands were built to provide habitable area like the island of Hulhurmale which was created to house the increasing the population of the Maldives capital of Male & was purposefully worked at 2 m above the ocean level. The comparable routine of building fake islands on Persian Gulf is to host visitor establishments (The World, the Palm Islands, the Burj al-Arab in Dubai, & the Lulu Island in Abu Dhabi are the most renowned ones) likewise they must be noted, particularly considering the size of the establishment constructed. These are not only built to encourage travelers, however, these are tests of AIS utilized as human natural surroundings. Example from Indian subcontinent is Mumbai which is made by the combination of 7 islands, which was recovered to cater the population growth & for further expansion.

#### IV. LITERATURE

The Palm Islands are a group of artificial islands in Dubai, United Arab Emirates on which real business & private frameworks are built. The islands are -

- i. The Palm Jumeirah
- ii. The Palm Jebel Ali
- iii. The Palm Deira.

Engineered land of 50 sqkms. Was constructed by the process of rain bowing sand, burrowed from the Persian Gulf which is surrounded by far-reaching shake of sea wall.

The Risk of liquefaction was discarded in the midst of advancement by vibro-compaction. Dubai is one of the richest places in world which has oil industry as a major source of income. It was believed that the oil in Dubai would have been finished by 2016, thrashing its economy to ground. So to uphold the economy, the lands' area was created into a luxurious resort to attract tourists which would help in increasing the economy of the nation. Dubai mostly has sunny days throughout the year & around 5 million tourists visit Dubai annually, but the Sheikh of Dubai wanted to be more than 15 million, but the Coastline of Dubai was 72 kms which was not enough for this number. So there was a need to increase the coastline. The Sheikh Muhammad planned to build palm tree shaped island that was expected to expand the coastline by 56 kms, which helped in increasing the tourism for the country which increasing the economy. This structure of island is free from concrete making it eco-friendly. It (is expected) solved the problem of land for the construction near the sea shore. The construction was done mainly by sand & stones to reduce the effects on the environment. The construction provided extra land for the construction of liveable space & recreational facilities & it also improved the aesthetics of the country's sea line.



The Palm Jumeriah



The Palm Deira

#### V. DRAWBACKS

Although the artificial islands & or land reclamation have been somehow successful in making new areas for living or other purposes in present era of rising sea level, fast

increasing population & shortage of land, it had somehow ignored the demerits of constructing on marine environment. These practices had been criticized by environmentalists. Sea laws had been made for activities related to seas & oceans but there had been ignorance of these laws to achieve certain objectives. Looking at the examples of Palm Island, the Palm Jumeirah has harmed natural life, expanded turbidity & changed the along shore dredges transport. The engineer has adopted few natural alleviation measures & has for the most part clung to the Equator Principles. Be that as it may, the engineer forgot a couple of essential chances to alleviate. Similarly, because of political support & lawful escapes clauses, the engineer has been allowed to disregard important natural laws. In the future, designers need to hold fast to the nearby ecological laws, abstain from constructing islands on coral reefs & also to the equator principles fastidiously.

Construction of new island is costly & risky. Also the construction of such island harms the marine life. There had been few examples from the past which led to a great economic loss. For example, Isola Di Lolando is an incomplete fake island in the Biscayne Bay, Florida. Storm harm & monetary crumple made the venture relinquished not long after the beginning of development, yet pilings stay obvious in the sound & are a hazardous to sea route.

## VI. FUTURE OF ARTIFICIAL ISLANDS

Due to the increase in population and rise in the sea level, the artificial islands are expected to be more in practices in the future. Due to rise in the sea level (because of global warming) land reclamation could be the most effective tool for creating new spaces for habitat or for recreational needs. There have also been several proposals of land reclamation in Asian, countries, like in Hong Kong. Keeping the aim in mind to build the islands, the legislature recorded 25 conceivable destinations for land recovery & the Public Council has been proposed in 2011.

In India, the coastal areas are not as heavily dense as compared to areas in the plains. But cities like Mumbai (with limited area) had faced a consistent migration towards the city from whole country. The city was reclaimed from 7 islands. Similar possibilities can be seen in other coastal areas which have been expected to observe the shortage of lands in the coastal areas, especially for human livings. Due to environmental damage caused by A.I.S. & reclamation projects & also due to criticism from worldwide, there is higher possibility of looking for alternates of providing future habitat or recreational spaces. With changing & advancement in the technology, the concept of floating islands can be seen as a suitable solution to provide lesser damaged to the environment & higher expansion of the cities. There are several proposals worldwide for creating new floating islands, but due to its cost & risk factor, it is not in practice now. Although, in the near future there more will be higher need of new areas, such constructions will be considered more seriously either with cheaper and efficient technologies or will be demanded to create with high construction costs due to the demand.

## VII. CONCLUSION

The requirements of constructing artificial islands have been changed since the ancient to the current times. In

the earliest times, they were built for cultural, or religious purposes & also for some reasons of safety. But after the 16th century AD, there had been formation of these islands for the purpose of defense and to generate economy. Now in the current scenario, the need for new spaces (due to the increase in the population) for living and recreational activities have triggered a new era of artificial islands. Almost every country with coastal boundaries takes such measures. The land reclamation had been a successful practice for tackling issues like rise in the sea level, space shortage & high population to provide new spaces for habitats. The formation of new island brings many new opportunities, but the laws of the sea shouldn't be ignored. Making of these projects are very risky & any failure of such project may cause high loss of economy and human life.

Before proposing such projects, there should be considerations for marine life & the site should be constructed where damage to marine life is less and also the risk of failure of such project is low. In the case of failures of such projects, there should be some plans to make things back to normal in the site of construction, seeing at the examples of Lolando island, whose remaining piles still stand in the sea route that keeps the chances of accidents for the ships or boats sailing nearby.

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