



# Dome Housing in Vanuatu

*Cyclone proof housing for a cyclone prone nation.*

## Introduction:

It is the Vanuatu Foreign Investment Promotion Agency's (VFIPA) focus to facilitate and assist the inflow of new Foreign Direct Investment (FDI) into Vanuatu whilst assisting and aiding the expansion of established FDI already in the country.

It is therefore the Agency's role to present the case of *Pacific Ocean Domes*, an active FDI activity by Australian investor Mr Daryll Kelly, that provides for the construction of dome structures/shells considered extremely ideal for cyclone shelter housing whilst also being earthquake proof.

## Investment Constraints

*Pacific Ocean Domes* is currently located at the Tasiriki residential area just before the Erakor Bridge. At the investment location, four dome structures are on display showcasing two floor dome housing that can house up to 15 people because of its expansive living space. However there are a few constraints that disallow the expansion of the investment activity.

### Residential Dwelling vs. Commercial Building

The Foreign Investment Act No. 25 2019 has included a clause that allows for the revision of Vanuatu's current Reserved and Restricted List of Investments prohibiting various investment activities.

The construction of any residential dwelling is currently included in Vanuatu's Reserved List (list of business activities reserved solely for Ni Vanuatu participation).

Foreign investors wanting to invest in any construction activity in relation to buildings are only allowed a commercial building construction (construction of buildings for office space or any other commercial activity).

With this restriction in place, *Pacific Ocean Domes* currently is not permitted to provide cyclone proof homes for any client unless it is any other structure than a residential dwelling.

### Country Needs vs. Investment Constraints

In 2018 Vanuatu was ranked by the World Risk Index as the most prone country to natural disasters in the world.

Vanuatu has since faced 2 Category 5 cyclones, TC Pam in 2015 and the most recent one being TC Harold in 2020. TC Pam damaged 80% of households in Tafea Province where it caused the most destruction and almost 40% of households in Shefa Province. TC Harold affected Vanuatu's northern provinces of Penama and Sanma and although no official household report has been published as yet, it has caused extensive damage and devastation to the livelihood of people on Pentecost and Santo.

It can only be expected that Vanuatu will continue to receive further tropical cyclones that can grow in strength due to the adverse impacts of climate change specifically in heightened extreme weather patterns and occurrences.

## *Pacific Ocean Domes*

Dome shelters have proven their strength and durability for years on end especially in the United States where hurricanes and tornados are common. *Pacific Ocean Domes* provides dome shelter housing that is based on a concept developed over the last thirty years by Monolithic Domes U.S.A.

In their presentation to the VFIPA team, they outlined the technology used in their buildings that ensures an extreme building life expectancy of up to 300 years. *Pacific Ocean Domes* cover the five most destructive issues affecting the life expectancy of buildings on tropical islands in cyclone prone areas:

- Most effective earthquake safe buildings
- Most effective cyclone safe buildings
- Buildings impervious to termite damage
- Fireproof buildings
- Buildings that will never suffer concrete spalling

*Pacific Ocean Domes* uses proven construction technology with the use of an Airform which is reusable and results in lower construction costs. *Pacific Ocean Domes* is pioneering the use of a recently developed reinforcing technology called Basalt Reinforcing. Basalt Reinforcing has many great advantages, some of which are:

- it doesn't conduct electricity,
- it has the same expansion rate of concrete,
- and probably the most important of all it doesn't rust, which means that the POD's will NEVER suffer from concrete spalling, commonly known as concrete cancer.

*Pacific Ocean Domes* does not use any steel in contact with concrete. They have developed a method to replace the steel in all phases of the work to ensure there is no concrete spalling. The base of the POD's has a reinforced concrete ring beam with underfloor cross beams poured at the same time as the slab.

Piping is not carried underfloor however through the walls thus creating less hassle in the case of any repairs. This is part of its overall low cost production measure to ensure that buildings last longer without the added cost. The *Pacific Ocean Domes* are constructed with an Airform, which is a balloon like, inflatable structure that determines the shape and size of a dome, while the basalt provides a corrosion resistant structure for long maintenance free life.



## Future Recommendations

The Government's key message to build for the future is ever more important now as Vanuatu braces itself for the possibilities of more severe weather patterns with unforeseen damage and destruction.

Building weather proof homes and buildings must be a priority for a country ever so prone to cyclones, earthquakes, volcanic ash fall and further natural disasters.

Based off the discussions and research that VFIPA has carried out with *Pacific Ocean Domes* and other sources, it is important that the investor be given the opportunity to assist the needs of building for a better and secure future.

Therefore the VFIPA Management provides its support by recommending the following:

- The Reserved List be temporarily lifted specifically for the activity number 14: *Residential building and construction* be temporarily lifted to accommodate the construction of residential dwellings that provide a secure cyclone and earthquake proof housing for the citizens of Vanuatu.
- That this temporary lift include businesses such as *Pacific Ocean Domes* and other businesses (foreign investors) that share the same focus in ensuring cyclone proof housing.

If this exercise proves successful the VFIPA is further recommending that Activity No. 14 of the current Reserved List be opened up to foreign investment through necessary consultation and discussions and that there be a systematic approach that should encourage Ni Vanuatu participation and up skilling through this overall process.

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